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TETRACYCLINE FOR MUSCLE ATROPHY

Muscle atrophy occurs in numerous pathologies such as cancer, sepsis and prolonged periods of muscle inactivity. Among the mechanisms suggested to contribute to local catabolism and progressive skeletal atrophy are activation of systemic and local markers of inflammation, increased levels of oxidative stress and matrix remodeling. As a defense strategy, muscle tissues have been found to induce enzymes including matrix metalloproteinases (MMPs) and heat shock protein-70 (HSP-70).

MMPs are a family of proteolytic enzymes which are crucially involved in the turnover of extracellular matrix components. Tetracycline has been shown to inhibit, by several non-antimicrobial mechanisms, the activity of several host derived MMPs responsible for connective tissue breakdown. This study sought to determine the effects of tetracycline on HSP-70 and MMPs on rats immobilized by external fixation.

The right knees of twenty-month-old rats were immobilized by rigid external fixation devices for one, two, three, and four weeks. Tetracycline, mixed with normal saline, was administered three times per week within two days of placement of the external fixator. A control group was immobilized for three weeks, and did not receive tetracycline. A second control group received tetracycline for three weeks without normal saline. The rats were euthanized for evaluation at week one, two, three, or four, post-fixation.

Body weight did not significantly differ between groups at any time measured. After three weeks of immobilization, muscle mass was decreased in the gastrocnemius soleus and quadriceps. No significant difference was found in gastrocnemius or quadriceps muscle weight between those immobilized

with tetracycline and the immobilized only controls. However, a significant increase in MMP2 and HSP-70 protein and mRNA levels in type II-b fibers occurred in the immobilized control animals. Those factors did not change in those animals treated with tetracycline.

Conclusion: This animal model of immobilization induced muscle atrophy found that tetracycline administration during immobilization can abolish the increase in matrix metalloproteinases and heat shock protein, both of which contribute to muscle degradation.

Rmeli, E., et al. Tetracycline Therapy for Muscle Atrophy Due to Immobilization. **J Musculoskel Neuronal Interact.** 2009, June; 9(2): 81-88.

EFFECT OF ANTERIOR CERVICAL SURGERY ON HEADACHES

Patients with cervical spine-related headaches typically report neck pain radiating through the paraspinal muscles into the head. Others report pain in the lower occipital and temporal regions, which can radiate into the face or the periorbital, frontal and parietal regions. Typically, nonoperative treatments for cervicogenic headaches include noninvasive measures. Invasive treatments such as local anesthetic blocks, steroids, botulinum toxin, radiofrequency, dorsal column stimulators and surgeries have also been used. This study sought to determine whether anterior cervical reconstructive surgery for the treatment of radiculopathy or myelopathy may also help alleviate associated headaches.

The authors used the results of two, prospective, multicenter, randomized trials. This *post hoc* analysis relied upon data initially collected for the comparison of

different instrumentation devices. All subjects had previously failed nonoperative treatment and were diagnosed with radiculopathy or myelopathy arising from a single cervical level. A total of 1,003 patients were evaluated with the Neck Disability Index, both preoperatively and then at five different time points postoperatively. Mean headache scores for each group were obtained at each time period.

At baseline, 86% of the patients complained of headaches. The headaches were rated as mild by 34% and as severe by 52% of the participants. At final follow-up, headaches were absent in 34.9%, mild in 46.7% and severe in 18.4% of the patients. Improvement from baseline was significant at all follow-up intervals, with p values of <0.0001 at each evaluation.

Conclusion: This study of patients with cervical radiculopathy or myelopathy found that those treated surgically with anterior cervical decompression experienced significant improvement in their cervicogenic headaches.

Riina, J., et al. The Effect of an Anterior Cervical Operation for Cervical Radiculopathy or Myelopathy on Associated Headaches. **J Bone Joint Surg.** 2009; August, 91-A(8) 1919-1923.

BMI AND STROKE

Although mortality after stroke is highest in the first months, survivors have a higher mortality risk than do individuals in the general population for several years thereafter. Obesity, a growing pandemic, is an established stroke risk factor, and an important predictor of death in the general population. This study assessed the association between body mass index (BMI) and mortality among survivors of stroke.

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Data were obtained from the Third National Health and Nutrition Examination Survey (NHANES), a nationally representative survey of 33,199 U.S. individuals, conducted between 1988 and 1994. The study's endpoints, both all cause and cardiovascular mortality, were recorded as time to event outcomes. Mortality records were available for 20,024 adults who completed interviews and medical examinations.

Among the participants, 644 reported a physician diagnosed stroke and had mortality data available. Data were available for 424 subjects for analysis of all cause mortality. The study's primary outcome variable was all cause mortality with a secondary outcome variable of cardiovascular mortality. Covariates included variables known to be associated with obesity and mortality after stroke.

Of the 20,050 subjects, 17,648 had completed BMI and stroke history data. Stroke survivors were more likely to be overweight or obese than were those without a history of stroke ($p=0.003$). Multivariate analysis revealed that older age, a history of smoking, a history of myocardial infarction, diabetes mellitus, and hypercholesterolemia were associated with higher cardiovascular mortality. Bivariate analysis revealed that BMI increases were associated with lower all cause mortality and cardiovascular mortality ($p < 0.001$ and $p < 0.001$, respectively). However, an elevated BMI in younger individuals was associated with a higher all cause mortality.

Conclusion: This study of stroke survivors found that a higher BMI after stroke is associated with a decreased, overall risk of mortality. However, among younger stroke survivors, a higher BMI was associated with an increased risk of mortality, as compared to normal weight.

Towfighi, A., et al. The Impact of Body Mass Index on Mortality after Stroke. *Stroke*. 2009, August; 40: 2704-2708.

CEREBELLAR TMS HELPS PARKINSONIAN LEVODOPA-INDUCED DYSKINESIAS

Levodopa-induced dyskinesia (LID) may originate from aberrant cerebellothalamocortical activity.

This phenomenon can limit the tolerability of a therapeutic dose of levodopa. Transcranial magnetic stimulation (TMS) over the cerebellum has been shown to improve the excitability of the cerebellothalamocortical circuits. This study investigated the short-term effects of TMS on LID.

Patients with Parkinson's disease (PD), each with a stable medication regimen and symptoms of LID, were enrolled in three, different experiments. In the first, ten patients were given supra-therapeutic doses of levodopa, and were then presented with continuous theta burst stimulation (cTBS) TMS over the bilateral cerebellum. A control group was given a sham TMS treatment. Examiners held blind to the technique rated LID using the Core Assessment Program for Surgical Intervention Therapies (CAPSIT) scale.

In the second experiment, the same ten patients were given a normal dose of levodopa, along with cTBS or sham TMS over the left cerebellum. Motor evoked potentials, stimulated over the left motor cortex while recording the right first dorsal interosseus muscle, were measured before and ten minutes after cTBS. In the third experiment, twenty patients received either CTBS or sham TMS for ten days or two weeks. LID was assessed at baseline and then at two, four and six weeks. The patients kept logs of LID symptoms.

An improved CAPSIT score was observed with cTBS to the cerebellum immediately after stimulation ($p=0.008$). Motor cortical activity was also improved after cTBS, as measured by motor evoked potentials ($p<0.05$). In the third experiment, cTBS improved CAPSIT scores at two, four, and six weeks. Patient-logged dyskinesias improved during the first and second week of cTBS, and during the first week after cTBS ($p=0.02$, $p=0.01$ and $p=0.03$, respectively). No significant improvement occurred in sham-TMS patients.

Conclusion: This study of patients with Parkinson's disease, and levodopa induced dyskinesia found that continuous theta burst stimulation of transcranial magnetic stimulation over the cerebellum can reduce the symptoms of dyskinesia.

Koch, G., et al. Cerebellar Magnetic Stimulation Decreases Levodopa Induced Dyskinesias in Parkinson

REPEATED PARIETAL THETA BURST STIMULATION AND VISUAL NEGLECT

Repeated transcranial magnetic stimulation (rTMS) is a noninvasive method of influencing cortical activity. Depending upon the frequency of discharge patterns of the magnetic pulses, inhibitory or facilitator effects can be achieved. This study sought to determine whether parietal stimulation with inhibitory TBS over the unaffected hemisphere could reduce abnormal hyperactivity, and, thereby, decrease left-sided neglect among patients with stroke.

Eight, right-handed patients with left-sided visual neglect attributed to right hemisphere stroke were studied. The diagnosis of neglect was based upon neurologic examination. Four experiments were performed, each time including five patients. TBS was applied using an active or a sham coil. In the active condition, a continuous train of 801 pulses, delivered in 267 bursts, were delivered over P3. This area overlies the left posterior parietal cortex, close to the intra-parietal sulcus. In order to evaluate the specificity of the TBS effect, three conditions were tested: two TBS trains over the left contralateral posterior parietal cortex, two trains with sham stimulation over the contralateral posterior parietal cortex, and a control condition with no intervention.

All patients tolerated the stimulation without side effects. Active TBS significantly improved perception of targets presented on the left side for up to 32 hours. The TBS effect was specific, as sham stimulation did not improve neglect symptoms as compared to the control condition.

Conclusion: This study of patients with neglect due to stroke demonstrates that repeated applications of TBS over the contralateral posterior parietal cortex significantly improves perception of visual targets presented on the left side for up to 32 hours after stimulation.

Nyffler, T., et al. One Session of Repeated Parietal Theta Burst Stimulation Trains Induces Long-Lasting Improvements of Visual

ANTIDEPRESSANTS AND THE RISK OF PD

Parkinson's disease (PD) is a disorder of the central nervous system, characterized by a gradual loss of dopaminergic neurons in the substantia nigra. Some studies have provided evidence that PD and depression are linked. However, it is unknown whether depression is an early sign of PD, or whether depression increases the risk of developing PD. This study investigated the relationship between the onset of antidepressant use and the risk of PD.

The authors used data from the General Practice Research Database (GPRD), which includes longitudinal clinical information on more than three million Britons attended by general practitioners. From this database, a cohort of participants free of PD or not taking PD related medications were identified from the period of 1995 to 2001. From that database, 1,904 cases of index PD were identified.

The date of PD onset and information concerning prescriptions for antidepressant medications were collected from computer records. Patients with PD were matched to controls by age and gender. Rate ratios and confidence intervals were calculated to determine the relationship between antidepressant medication use and the risk of developing PD.

Initiation of antidepressant medication was associated with a higher risk of developing PD (RR=1.85). The highest risk was seen among individuals with a recent diagnosis of depression. The rate ratio for developing PD was higher during the first two years after the initiation of antidepressants.

Conclusion: This study suggests a link between depression and Parkinson's disease such that depressive symptoms may represent the first manifestation of PD.

Alonso, A., et al. Use of Antidepressants and the Risk of Parkinson's Disease: A Prospective Study. *J Neur Neurosurg Psych.* 2009, June; 80: 671-675.

GROUP EXERCISE, COGNITION AND MOOD

Aging and depression play significant roles in cognitive decline. Previous studies have looked at the effect of exercise on cognitive decline. This study sought to better understand the effect of a general, group-based exercise program on cognitive performance and mood among individuals without dementia.

This study included 154 male and female seniors living in intermediate or self-care facilities. The subjects were randomized to a general, group-based resistance and balance training exercise program (GE), a group-based flexibility and relaxation technique program (FR) or to a no exercise control (NEC). Each exercise group participated in one-hour exercise classes twice a week for six months. Standard neuropsychological tests were used to determine cognitive performance. Those tests included measures of fluid intelligence, visual, verbal and working memory, and executive function. Mood was evaluated with the Geriatric Depression Scale (GDS) and the Positive and Negative Affect Schedule (PANAS). The tests were performed prior to the initiation of the programs and after their completion.

Participants in the GE program showed significant improvement in fluid intelligence as compared with the participants in the FR and NEC groups. No significant changes occurred in memory or executive function. Significant improvements on the GDS and PANAS were seen in both of the exercise groups.

Conclusion: This study found that a six-month intervention with group-based resistance and balance training can significantly improve fluid intelligence and mood. Flexibility and relaxation technique programs are also beneficial for enhancing mood.

Brown, A., et al. The Effect of Group Based Exercise on Cognitive Performance and Mood in Seniors Residing in Intermediate Care and Self-Care Retirement Facilities: A Randomized, Controlled Trial. *Br J Sp Med.* 2009, August; 43: 608-614.

SOCIAL DYSFUNCTION AFTER MILD TO MODERATE STROKE

As stroke treatments continue to improve, and the number of

recovered patients grows, level of social function has become an important outcome measure. This study investigated the frequency and determinants of social functioning several months after mild to moderate stroke.

This prospective, cohort study included patients admitted consecutively to a stroke unit with a first-ever stroke. The subjects ranged in age from 16 years to 65 years. At inclusion in the study, handedness was recorded, and the participants were evaluated for depression using the Beck Depression Inventory, the Hospital Anxiety/Depression Scale and the Mini Mental State Examination. Neurologic deficit was assessed using the NIHSS at admission and at the time of the evaluation. In addition, patients were assessed for handicap, activities of daily living, and self-estimated work and social dysfunction.

Fifty-seven of the 84 patients included complained of significant social dysfunction, attributed to the stroke. Four items, ability to work, home management, social leisure, and private leisure, accounted for 55% of the variance.

Conclusion: This study of patients with mild to moderate stroke found that the majority report significant work and social dysfunction, attributed to the stroke.

Hommel, M., et al. Social Dysfunction after Mild to Moderate First-Ever Stroke at Vocational Age. *J Neur Neurosurg Psych.* 2009, April; 80: 371-375.

CLINICAL UTILITY OF INPATIENT ELECTRODIAGNOSTICS

Inpatient electrodiagnostic studies are often requested as part of the work-up for patients hospitalized with symptoms suggestive of a neuromuscular disorder. However, the clinical utility of electrodiagnostic studies for the evaluation of inpatients with neuromuscular symptoms has not been well studied. This study assessed the contribution of inpatient electromyograms (IP-EMGs) to the diagnosis and management of such patients.

Medical records of patients at a tertiary medical center who underwent electrodiagnostic testing from January of 2005 to December of 2007 were retrospectively reviewed.

Studies were classified according to one of five categories, a) studies which confirmed the clinical diagnosis, b) those which identified new and relevant diagnoses, c) those that found an initial diagnoses, and d) those that were inconclusive or normal. Additional diagnostic testing and treatments based upon electrodiagnostics were also reviewed.

A total of 103 electromyograms were performed on 98 patients. The subjects' mean age was 61.5 years. The electromyograms confirmed the preliminary clinical diagnoses in 53.3% of the patients, while a new, clinically relevant diagnosis was made in 12.6% of the cases. A third of the cases received incidental diagnoses, and 16.5% of the electromyograms resulted in inconclusive results. Only three percent of the electromyograms were normal. Diagnostic evaluation and/or treatment changes, based on the results, were provided to 27.2% of the patients.

Conclusions: This study found electromyograms helpful in confirming a clinical diagnosis, as well as in identifying new, clinically relevant diagnoses among patients at a tertiary medical center. Electromyogram results impacted diagnostic evaluation and treatment for over one fourth of the patients.

Perry, D., et al. Clinical Utility of Electrodiagnostic Studies in the Inpatient Setting. *Musc. Nerve.* 2009, August; 40: 195-199.

EARLY INITIATION OF CONSTRAINT INDUCED MOVEMENT THERAPY

Constraint induced movement therapy (CIMT) has been found to improve upper limb function in stroke survivors when initiated three to nine months after stroke. This study investigated the effects of CIMT when initiated early.

This single-blind study included 52 participants with unilateral strokes who were enrolled ten days after the onset of symptoms. The subjects were randomized to one of three groups. Two groups received CIMT, one with a standard protocol consisting of two hours of CIMT therapy with mittens to the unaffected side for six hours per day. A second group underwent high-intensity CIMT,

receiving shaping therapy for three hours per day, and were in mittens ninety percent of their waking time. A control group received two hours of conventional occupational therapy daily. All groups received their respective therapies five days per week for two weeks. The primary endpoint of the study was a ninety-day, post-stroke Action Research Arm Test (ARAT) of the affected side.

Overall, the groups were equivalent at baseline on all considered variables. All groups showed improvement in the ARAT scores at ninety days as compared with baseline. No significant difference in ARAT scores occurred between the control group and the standard CIMT group. However, the high-intensity CIMT group demonstrated poorer gains on ARAT scores than did the other two groups.

Conclusion: This study of patients with acute stroke found constraint induced movement therapy to be as effective as an equal amount of traditional occupational therapy in improving upper limb function. However, an inverse, dose response relationship with high intensity CIMT was noted.

Dromerick, A., et al. Very Early Constraint Induced Movements during Stroke Rehabilitation (VECTORS). *Neur.* 2009, July 21; 73: 195-201.

E-STIM IMPROVES HAND KINEMATICS AFTER STROKE

Following stroke, the affected side of the motor cortex has been found to have decreased excitability. In addition, inhibition of the affected side by the unaffected side is increased after stroke. The loss of balance between excitability and inhibition is hypothesized to result in poor motor function and dexterity. Electrical somatosensory stimulation (ESS) is known to increase the cortical excitability of the affected side. This study sought to determine the effect of ESS, applied at the median nerve, on motor dexterity.

Twelve, right-handed patients with chronic, middle cerebral artery territory strokes, without spasticity, ideomotor apraxia, aphasia or depression, received ESS to both the affected and unaffected hands. The treatment group received two hours of electrical supra-threshold

somatosensory stimulation of the median nerve of the affected arm. The control group underwent two hours of idle time. Kinematic motor analysis of index finger tapping, hand tapping, and reach to grasp motions were analyzed prior to and after receiving ESS.

Index finger tapping, hand tapping, and reach to grasp of the affected hand all improved in velocity after ESS ($p < 0.01$), but not after the control condition. Conversely, the unaffected hands of stroke patients displayed no kinematic change following ESS.

Conclusion: This study of patients with chronic stroke found that the kinematics of simple finger tapping, hand tapping, and reach to grasp improved following electrical somatosensory stimulation at the median nerve of the affected hand.

Koesler IB, et al. Electrical Somatosensory Stimulation Improves Movement Kinematics of the Affected Hand Following Stroke. *J Neur Neurosurg Psych.* 2009, June; 80 (6): 614-619.

KNEE OA AND OBESITY

Despite the fact that obesity is the most important modifiable risk factor for osteoarthritis, very few studies have examined whether obesity is associated with rate of cartilage volume loss for people with and without established osteoarthritis. This study assessed the rate of cartilage degeneration in the patellofemoral compartment of the knee, to determine whether this rate is associated with body mass index (BMI).

This study included 271 patients, 40 to 69 years of age, each with no clinical knee osteoarthritis. The subjects were followed for two years. At the beginning of the study period, BMI and adiposity were recorded for each patient. An MRI of the dominant knee was used to calculate patellofemoral cartilage volume. At two-year follow-up, those measurements and the MRI were repeated.

Between baseline and follow-up, subjects increased in percentages on absolute measures of fat mass, but did not have a significant change in body weight or BMI. Patella cartilage volume was lost at a rate of 1.8% per year. All baseline measures of

obesity and adiposity were associated with a higher annual rate of patella cartilage volume loss before ($p < 0.06$) and after adjustments for age, gender and baseline patella cartilage and bone volume (all $p < 0.04$).

Conclusion: This study of healthy adults with no history of knee osteoarthritis demonstrates that increased baseline measures of obesity and adiposity are associated with an increased annual rate of patella cartilage volume loss.

Teichtahl, A., et al. Obesity and Adiposity Are Associated with the Rate of Patella Cartilage Volume Loss over Two Years in Adults without Knee Osteoarthritis. *Ann Rheum Dis.* 2009, June; 68(6): 909-913.

NEUROPAGE AND TBI

Individuals who have suffered an acquired brain injury (ABI) often have difficulty with memory and planning. Electronic technology can considerably improve the performance of daily tasks in people with ABI, thus reducing their dependence on caregivers. Previous studies have found these methods to be effective in compensating for these impairments.

The NeuroPage system involves an electronic pager, worn by the person with an ABI. The pager provides preprogrammed, timely reminders to perform tasks defined as "target behaviors," which have been specified in advance by the patient. Because these impairments can also cause significant stress among caregivers, this study sought to determine whether the use of this device can reduce caregiver strain.

A NeuroPage device delivers reminders to perform tasks throughout the day, such as taking medicine and remembering appointments. This study involved two groups, either with the device or on a waiting list for the device. The modified Caregiver Strain Index (mCSI) was completed at three time points throughout a seven-week period by caretakers of 99 people with ABI. That questionnaire addressed strain resulting from caring for the injured individual.

This study used a cross-over design that involved alternately allocating patients in blocks of ten to

one of the two groups, with measurements taken at three time points over a sixteen-week period. Group A used the NeuroPage device for seven weeks. Target behaviors were measured for the last two weeks of that period, during which the mCSI was completed by the caretakers for a second time.

Group B were held on a waiting list for the same seven weeks, during the last two weeks of which target behavior assessments and mCSI data were again collected. At the end of that seven-week period, NeuroPage devices were withdrawn from patients in Group A and assigned to members of Group B. For both groups, the study continued for a further seven weeks, during which target behaviors were assessed and the mCSI completed during the final two weeks, designated as time point three. The overall effect of the introduction of NeuroPage was assessed by combining data from the two groups.

Separate, matched-pairs t-tests revealed that the reduction in strain was significant for both caregivers who were spouses ($p = 0.002$) and those who were parents ($p = 0.01$). The degree of reduction in strain was similar in those two groups. From these results and those of prior research, the authors concluded that the use of NeuroPage reduces caregiver strain, in addition to improving performance of everyday tasks.

Conclusion: This study demonstrates that, for patients with acquired brain injury, the use of an electronic paging device, the NeuroPage, can reduce caregiver strain, in addition to improving performance of daily activities.

Teasdale, T., et al. Alleviation of Caregiver Strain during the Use of the NeuroPage Device by People with Acquired Brain Injury. *J Neur Neurosurg Psych.* 2009, July; 80(7): 781-781.

INCIDENCE OF MEDIAL MENISCAL TEARS IN ACL INSUFFICIENCY

Most studies have suggested that the incidence of meniscal tears rises with longer follow-up after anterior cruciate ligament (ACL) injury. Other studies have suggested that the incidence of lateral meniscal tears remains relatively unchanged with

time, while that of medial meniscal tears increases. This study sought to explore the medial meniscal status in chronic ACL deficient knees.

Between February of 1999 and July of 2005, the authors identified patients who had undergone ACL reconstruction and medial meniscal repair. Of those, cases were identified wherein surgery had been delayed for at least six months, and wherein MRI studies had been completed at least two times before surgery. Comparisons were made between serial MRI results and the patients' ages, times from injury, rates of repetitive injury and activity levels.

Thirty-one subjects were identified, with a mean age of 28.5 years. The mean time from initial injury to surgery was 49.9 months. Review of the MRIs revealed that 55% of the first MRIs had identified a medial meniscal tear, with 84% identified by the second study ($p=0.0054$).

Conclusion: This study of patients with chronic anterior cruciate ligament injury suggests that the incidence of medial meniscal injury in these patients increases significantly within 36 months of injury.

Yoo, J., et al. Increasing Incidence of Medial Meniscal Tears in Non-Operatively Treated Anterior Cruciate Ligament Insufficiency Patients Documented by Serial Magnetic Resonance Imaging Studies. *Am J Sp Med.* 2009, August; 37(8): 1478-1483.

LICOFELONE VERSUS NAPROXEN FOR OA

Osteoarthritis (OA) is the most common arthritic condition worldwide, and is a major cause of disability. Licofelone is a pyrrolizine derivative that acts as a competitive inhibitor of both 5-lipoxygenase and cyclooxygenases. It is a substrate analogue to arachidonic acid that competes at the active site of these enzymes. It has been shown to be a very potent anti-inflammatory in preclinical and clinical studies of patients with OA. This study compared the protective effects of licofelone with those of naproxen.

This multicenter, randomized, double-blind, parallel group study included 355 subjects ranging in age from forty to eighty years. All had

been diagnosed with moderate knee OA. The patients were randomized to receive either licofelone, 200mg twice per day, or naproxen, 500 mg twice per day. Quantitative MRI and x-ray were performed at baseline, and at six, twelve, and 24 months. The primary outcome measure was cartilage volume change over time. Secondary outcome measures included joint space width, clinical symptoms, as measured by the WOMAC, digital analog scale scores, rescue drug use and adverse events.

In the intention to treat analysis cartilage volume loss was significantly less in the licofelone group than in the naproxen group at both twelve and 24 months ($p<0.001$). X-rays revealed smaller joint space width loss at twelve and 24 months for licofelone, although that finding was not statistically significant. Statistically significant, initial improvement of pain and total WOMAC scores, favoring naproxen over licofelone, was noted at six months ($p\leq 0.05$). However, the difference between the groups' average changes was not statistically significant at all subsequent time points.

Conclusion: This study found that licofelone and naproxen are both effective in reducing symptoms of osteoarthritis, although licofelone seems to have protective effects over time for reduced cartilage loss.

Raynauld, J-P., et al. Protective Effects of Licofelone, a Five Lipoxygenase and Cyclooxygenase Inhibitor, versus Naproxen, on Cartilage Loss in Osteoarthritis: A First, Multicenter, Clinical Trial Using Quantitative MRI. *Ann Rheum Dis.* 2009, June; 68(6): 938-947.

PROGRESSION OF HAND OSTEOARTHRITIS

Hand osteoarthritis (OA) is a common joint disorder, leading to pain and reduced hand function. However, the disease course of hand OA is largely unknown. In order to obtain more information about the course of this disease, this prospective study reviewed its progression over two years.

The Genetics Arthrosis and Progression (GARP) study is a prospective, longitudinal, cohort study designed to evaluate susceptibility to, and progression of OA. The authors

investigated sibling pairs with clinical hand OA, or with structural abnormalities due to hand OA, as defined by the American College of Rheumatology. Self-reported hand pain and functional limitations were assessed at baseline and at study completion using a self administered, multidimensional questionnaire, the AUSCAN LK 3.0. That measure uses a four-point scale, including pain ratings and physical examination with lateral pressure at all IP and first CMC joints. Radiographic evaluation included views of both hands at baseline and at study completion.

A total of 172 patients completed the study. Self-reported pain and function deteriorated significantly over two years, with increases in over fifty percent of patients in both. In addition, functional limitation scores increased with increased pain scores ($p<0.001$). Osteophytes and joint space narrowing also deteriorated, with twenty percent progression in each category. Joint space narrowing scores increased with increases in osteophyte progression ($p<0.001$).

Conclusion: This study of patients with osteoarthritis (OA) of the hand demonstrates both clinical and radiologic deterioration over a period of two years. Middle-aged females were most affected.

Botha-Sheepers, S, et al. Progression of Hand Osteoarthritis over Two Years: A Clinical and Radiological Follow-Up Study. *Ann Rheum Dis.* 2009, August; 68(8): 1260-1264.

VERTEBROPLASTY FOR OSTEOPOROTIC SPINAL FRACTURES

Osteoporotic vertebral compression fractures are associated with pain, disability and death. A relatively new treatment option for these fractures is percutaneous vertebroplasty. This study sought to better understand the clinical utility of this procedure.

Subjects were 131 patients, six years of age or older, all with one to three osteoporotic vertebral compression fractures. Each had a pain score of three or more. The patients were randomized to receive either percutaneous vertebroplasty, with injection of medical cement, or simulated vertebroplasty placebo. Primary outcome measures included

the modified Roland-Morris Disability Questionnaire (RDQ) and the patients' ratings of average pain intensity at one month.

The two groups did not differ significantly with respect to either of the two primary outcomes at one month. Mean pain intensities were 3.9 in the treatment group and 4.6 in the control group ($p=0.19$). The two groups both enjoyed substantial improvement in back related disability and pain three days after the procedure, with similar improvements in the two groups. At three months, twelve percent of the vertebroplasty group and 43% of the control group crossed over to the other group, in order to undergo the alternative procedure ($p<0.001$).

Conclusion: This study of patients with painful osteoporotic vertebral compression fractures found similar treatment outcomes at one month among those treated with vertebroplasty and those treated with a simulated procedure.

Kallmes, D., et al. A Randomized Trial of Vertebroplasty for Osteoporotic Spinal Fractures. *N Eng J Med.* 2009, August 6; 361: 569-579.

VITAMIN D AND COGNITIVE PERFORMANCE

Some studies have suggested that vitamin D deficiency adversely affects cognition and behavior. This observation is bolstered by the presence of vitamin D receptors in areas of the brain related to behavior. The study analyzed population data from the European Male Aging Study (EMAS), in order to explore whether vitamin D levels are related to performance on cognitive testing.

The EMAS is a cross sectional survey of randomly stratified men, ages 40 to 79, in eight European cities. Data collected included demographic, health, education and lifestyle information, as well as variables associated with aging. From that group, 3,133 agreed to be interviewed, using questionnaires addressing physical activity and mood. Interviews were followed by physical examinations, used to determine function. Morning fasting 25(OH) D levels were obtained and were analyzed in a single laboratory. Subjects completed psychological tests assessing a variety of cognitive

domains. Those test results were compared with vitamin D levels.

After adjusting for age, 25(OH) D levels at or below 35 nmol/L were associated with impaired cognitive performance on all tests. However, after controlling for additional compounding variables, only information processing speed results, as assessed with the Digit Symbol Substitution Test, were significantly associated with higher vitamin D levels. Further, that finding was significant only for men over the age of sixty years.

Conclusion: This study demonstrates that low 25(OH)D levels are associated with poor information processing in a population-based sample of European men over the age of sixty years.

Lee, D, et al. Association Between 25-hydroxyvitamin D Levels and Cognitive Performance in Middle-Aged and Older European Men. *J Neur Neurosurg Psych.* 2009, July; 80: 722-729.

STROKE AMONG MEDICARE PATIENTS

Stroke remains a prevalent cause of death and disability in the United States. Consequently, the cost of health care for these patients is thought to be quite substantial. It is prudent, therefore, to identify all possible stroke risk factors and to assess their effects, so that appropriate intervention points may be targeted. This study prospectively explored the roles of sociodemographic and socioeconomic variables, place of residence, health behavior, and disease history, as well as functional and cognitive status risk factors, on the risk of stroke.

The authors used the large, nationally representative database of the Assets and Health Dynamics among the Oldest Old (AHEAD) survey, comprising 5,511 participants over the age of seventy years. Each subject underwent a baseline interview between 1993 and 1994, which was matched with Medicare claims from 1993 to 2005. Subsequent strokes were identified by two ICD-9-CM codes, one highly sensitive and one highly specific for stroke. Baseline risk factors were identified from survey data, and

included sociodemographics, socioeconomics, place of residence, health behavior, disease history, and functional/cognitive status measures. In addition, a time-dependent marker reflecting post-baseline, non-stroke hospitalizations was included to reflect "health shock".

Among the participants surveyed, 6.8 to 9.9% had a stroke during the twelve-year follow-up period. Risks included age, widowed/never married status, multi-story homes, a history of diabetes, hypertension or stroke, difficulty picking up a dime, refusal to answer the Delayed Word Recall Test, and poor cognitive status. The health shock variable revealed a 200 to 480% increased risk of stroke during the seven days following a non-stroke related hospitalization.

Conclusion: This study suggests an especially vulnerable post-hospital transition period from adverse effects, associated with both their underlying health shock (the reasons for the recent hospital admission) and the consequences of their treatments. Thus, in addition to previously established risk factors, an increase in stroke is found following hospitalization for non-stroke related illnesses.

Wolinsky, F., et al. A Twelve-Year, Prospective Study of Stroke Risk in Older Medicare Beneficiaries. *BMC Ger.* 2009, May 9: 17;

REST INTERVAL LENGTHS IN RESISTANCE TRAINING

Resistance training prescriptions combine a number of variables, among which the American College of Sports Medicine suggests that the load, number of repetitions per set, rest period between sets of exercises, length and type of muscle contractions, order of exercises and repetition blocks are all important. Some studies have shown that the influence of the rest interval may depend upon the position of the exercise in a sequence. This study compared the influence of two- and five-minute rest intervals on the number of repetitions per set and the total repetitions in resistance training sessions.

Fourteen trained men completed three sets per exercise of a ten-repetition, maximum load during four training sessions. Two sessions involved lower body exercises, with

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two- and five-minute rest intervals. The other two sessions involved upper body exercises, similarly, with two and five-minute rest intervals. The numbers of repetitions in each set were compared. The number of sessions with the two-minute rest interval was significantly less than that with the five-minute rest. The two-minute rest period resulted in significantly lower repetitions performed for all exercises in the second set, as compared to the first set.

Conclusion: This study suggests that a five-minute break between resistance exercise sets is superior to a two-minute break, as the longer break allows for a greater number of repetitions per exercise session.

Senna, G., et al. Influence of Two Different Rest Interval Lengths in Resistance Training Sessions for Upper and Lower Body. *J Sp Sci Med.* 2009, June; 8(2): 197-202.

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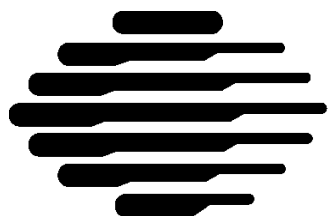
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