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STATIN TREATMENT AND ALL CAUSE MORTALITY

The beneficial effects of treatment with statins on cardiovascular mortality have been established by several long-term, placebo-controlled trials. However, as those clinical trials do not usually include individuals with multiple comorbid conditions, considerable concern remains regarding the applicability of those findings to the general population. This study evaluated the effect of statin therapy on a large and diverse cohort of patients treated for dyslipidemia.

This retrospective cohort included 229,918 adults enrolled in a health maintenance organization. All began statin treatment during that period. Mortality rates were compared among those with no history of coronary heart disease, those with such a history, and those with and without statin use. Statin use was also compared between statin use more than ninety percent of the time versus less than ten percent of the time.

During a median of four to five years follow-up, in both the primary and secondary prevention cohorts, those who took statins at least ninety percent of the time had at least a 45% reduction in the risk of death, as compared with patients who took statins less than ten percent of the time. A stronger risk reduction was noted for those with high baseline low-density lipoprotein cholesterol levels who had been initially treated with high efficacy statin.

Conclusion: This study revealed a strong and independent association between statin therapy and improved survival in patients with and without known coronary heart disease.

Shalev, V., et al. Continuation of Statin Treatment and All Cause Mortality. *Arch Int Med.* 2009, February 9; 169(3): 260-268.

INTRA-ARTICULAR STEROID INJECTIONS AND GLUCOSE LEVELS

Intra-articular steroid injection is a common treatment for symptomatic osteoarthritis (OA) of the knee. However, no prior data are available concerning the effect of those injections on blood glucose levels among those with diabetes. This study investigated the effect of the knee joint injection on blood glucose levels among diabetic patients.

This prospective study included well-controlled diabetic patients, all presenting with OA knee pain. Each had demonstrated an insufficient response to medical and physical therapy. All participants received intrarticular knee injections of one ml of celestone chronodose. The patients monitored their blood glucose levels before and two hours after breakfast, for one week prior to and then four days after the injection. Glucose levels were compared before and after the injections.

Six patients completed the study, all demonstrating brisk elevations of blood glucose levels within the first hour post-injection. The elevation persisted for 48 hours in five of the six patients. Following the increase, glucose levels declined to levels similar to baseline.

Conclusion: This study of patients with osteoarthritis of the knee and diabetes revealed that blood sugars rise within one hour of a steroid injection to the knee and remain elevated for 48 hours thereafter.

Habib, G., et al. The Effect of Intra-Articular Injection of Betamethasone Acetate/Betamethasone Sodium Phosphate on Blood Glucose Levels in Controlled Diabetic Patients with Symptomatic Osteoarthritis of the Knee. *Clin Rheum.* 2009; January 28: 85-87.

PHENOL NEUROLYSIS FOR SPASMS

Pain associated with spasticity may interfere with activities of daily living and/or sleep. While botulinum toxin injections have been used to manage painful spasticity, little is known regarding the efficacy of phenol neurolysis. This study investigated the effect of phenol for treating intermittent spasticity.

This study involved nineteen patients with partial spinal cord injury (SCI), all reporting symptoms of intermittent spasticity (Ashworth II-III) involving one muscle. Neurolysis was performed at the target muscles using a Teflon coated stainless steel injection needle connected to a nerve stimulator. One ml of five percent phenol was injected into each neurolysis point. The frequency of painful muscle spasticity was assessed at baseline and then at one, two, eight, and 24 weeks post-treatment.

The frequency of spasticity decreased significantly as compared to baseline levels ($p < 0.01$). That effect was marked and lasted for 24 weeks in 17 of the 19 patients. A total of 85% to 92% of the subjects reported complete to marked pain relief. All participants reported mild to moderate local pain following the injections, which disappeared within one to three days. No serious side effects were noted.

Conclusion: This study of involuntary, painful muscle spasms due to upper motor neuron lesions found that phenol neurolysis may be helpful in reducing the frequency and severity of pain associated with these spasms.

Shafshak, T., et al. Phenol Neurolysis for Relieving Intermittent, Involuntary, Painful Spasm in Upper Motor Neuron Syndromes: A Pilot Study. *J Reh Med.* 2009, February; 41: 201-202.

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EXERCISE AND OBESITY

Substantial evidence suggests that physical activity can protect against the development of chronic disease and can increase longevity. Early studies have suggested that moderate to high levels of cardio-respiratory fitness may attenuate the mortality risk of obesity. This study reviewed the literature addressing the relationships among disease activity, obesity, and physical activity.

The authors reviewed twenty, recent observational studies using joint stratification analysis of the effects of physical activity or cardio-respiratory fitness and obesity on various health outcomes. The studies included ten articles focusing on mortality and ten on cardiovascular disease (CVD), type II diabetes, or hypertension. The trials addressed all causes of cardiovascular disease and cancer mortality. In addition, studies of chronic disease morbidity were included.

Two Aerobics Center Longitudinal Study (ACLS) reports measured cardio-respiratory fitness and percent of body fat, finding that moderate to high fitness eliminated the elevated risk of all-cause, CVD, and cancer mortality associated with obesity. Results were similar for groups of older adults and men with diabetes, wherein obese individuals who were fit had no increase in risk of CVD or all-cause mortality. In all of these ACLS reports, obese, fit individuals had a lower risk of mortality than did normal weight but unfit individuals.

As a group, the studies demonstrated that physical activity or cardiorespiratory fitness tended to ameliorate the health hazards of obesity, regardless of obesity measures, gender, or baseline health status. However, the highest morbidity and mortality risk was observed among individuals who were both obese and inactive or unfit. The data were less clear concerning the relative relationships between obesity or cardiorespiratory fitness and diabetes.

Conclusion: This study revealed that physical activity or cardio-respiratory fitness may ameliorate many of the health hazards of obesity.

Lee, D., et al. Does Physical Activity Ameliorate the Health Hazards of Obesity? **Br J Sp Med.** 2009;

January 43: 49-51.

SODIUM OXYBATE FOR FIBROMYALGIA

Fibromyalgia syndrome (FMS) is characterized by chronic, widespread pain and allodynia in at least eleven of eighteen anatomically defined tender points. The syndrome affects an estimated three to six million people in the United States, primarily white females. In early studies of patients with narcolepsy, some individuals with coexisting FMS showed improvement in FMS symptoms following treatment with sodium oxybate. This randomized, double-blind, placebo-controlled trial further investigated sodium oxybate as a treatment for FMS.

A total of 188 patients with FMS were randomized into three groups. Group I received a placebo, group II received sodium oxybate at 4.5 g per day, and group III received sodium oxybate at 6 g per day. After eight weeks of treatment, the subjects were assessed for outcomes, including pain, fatigue, disease impact, tender points, insomnia, and impression of changes. Adverse events and compliance were also measured.

Significantly greater improvements in pain and disease impact were found for both treatment groups than for the placebo subjects. Those improvements included pain, as assessed by a visual analogue scale, and results on the Fibromyalgia Impact Questionnaire. Significant improvements were also found in sleep and on some quality of life measurements. Dose-dependent adverse events included nausea, dizziness, headache, paresthesias, somnolence, and renal/urinary disorders.

Conclusion: This trial found significant improvement in the symptoms and impact of fibromyalgia syndrome among patients treated with sodium oxybate.

Russell, I., et al. Sodium Oxybate Relieves Pain and Improves Function in Fibromyalgia Syndrome: A Randomized, Double-Blind, Placebo-Controlled, Multicenter Clinical Trial. **Arth Rheum.** 2009, January; 60: 299-309.

GRADED EXERCISE VERSUS DAILY WALK FOR LOW BACK PAIN

Low back pain (LBP) is among western society's greatest socioeconomic and medical challenges. Exercise therapy is widely prescribed for LBP, although the optimal prescription is yet unknown. This study evaluated the short- and long-term effects of a graded protocol emphasizing stabilizing exercises for the treatment of LBP.

Seventy-one patients with recurrent, nonspecific LBP were randomly assigned to either a graded exercise (stabilizing and strengthening) group or a daily walking group. The exercise subjects worked with a physical therapist, progressing according to pain level and observed movement control and quality. That group performed only low load endurance exercises. Subjects in the walking group were instructed to walk at the fastest convenient pace that did not cause pain. The primary outcome variables were perceived disability and pain at twelve months' follow-up.

At twelve months, 55% of the exercise group and 26% of walking group reported at least a fifty percent reduction in pain level ($p < 0.01$). The exercise group also enjoyed greater improvement in perceived disability than did the walking group. In addition, analysis of variance revealed that fear, avoidance, and self-efficacy beliefs improved only in the exercise group ($p < 0.001$).

Conclusion: This study of patients with low back pain found exercise emphasizing stabilization is more effective than daily walking in improving health and disability parameters.

Raasmussen, E., et al. Graded Exercise for Recurrent Low Back Pain: A Randomized, Controlled Trial with six, twelve, and 36 Months' Follow-Up. *Spine*. 2009, February; 34(3): 221-228.

ACTIVITY IN SPORTS AND STROKE

Previous studies have demonstrated that physical activity protects against stroke to the same degree that it protects against

coronary heart disease. However, evidence is conflicting concerning whether sports participation during adolescence and young adulthood can prevent later strokes. This study further explored whether recent and/or early adulthood sports participation offers protection against stroke.

This case control study randomly selected 370 patients with acute stroke or transient ischemic attack. Those individuals were matched by age and gender with controls. The subjects were assessed for recent and young adulthood sports activities. Comparisons of activity levels were made between those with and those without stroke.

Recent sports activities were reported less frequently among patients with stroke or transient ischemic attack (TIA) than among their control counterparts (25.4% versus 43.8%, $p < 0.0001$). When adjusted for cardiovascular risk factors, recent sports participation was significantly associated with a reduced risk of stroke or TIA (odds ratio 0.64). However, physical activity in young adulthood was not associated with a reduced risk of stroke.

Conclusion: This study found the risk of stroke to be reduced by recent and ongoing physical activity, with no evidence of a risk reduction due to more remote activity.

Grau, A., et al. Association between Recent Sports Activity, Sports Activity in Young Adulthood, and Stroke. *Stroke*. 2009, February; 40: 426-431.

PLASMA B12 STATUS AND CEREBRAL WHITE MATTER LESIONS

High concentrations of total homocysteine have been associated with a higher prevalence of cerebral white-matter lesions (WMLs), infarcts, and poorer cognitive performance. Homocysteine concentration is kept low by remethylation to methionine. For this reaction, folate and vitamin B₁₂ serve as substrate and co-factor, respectively. This study examined the associations of several markers of vitamin B₁₂ status with cerebral white-matter lesions, infarcts, and cognition.

The Rotterdam Scan Study is a population-based, cohort study designed to investigate the causes and consequences of age-related

brain changes in older individuals. A total of 1,019, randomly selected, elderly participants were evaluated for plasma concentrations of vitamin B₁₂, methylmalonic acid, holotransbalamin, and transcibalomin. All subjects underwent MRI scanning in 1995 to 1996, and all also underwent neuropsychological testing. Comparisons were made between the blood levels and the results of MRI and neuropsychological testing.

The data revealed a concentration-related association between low vitamin B₁₂ status, as indicated by lower plasma concentrations of vitamin B₁₂ and holotransbalamin, lower transcibalomin saturation, higher plasma concentrations of methylmalonic acid, and the severity of WMLs. The mean age and gender adjusted white matter lesion severity was significantly higher among persons with vitamin B₁₂ deficiency than among those without ($p < 0.001$). The adjusted analyses demonstrated no significant associations between cognitive performance and any of the studied markers.

Conclusion: This study found that vitamin B₁₂ status is associated with the severity of white matter lesions, especially in the periventricular area. However, no significant association was found between B₁₂ levels and cerebral infarctions.

De Lau, L., et al. Plasma Vitamin B₁₂ Status and Cerebral White Matter Lesions. *J Neur Neurosurg Psych*. 2009, February; 80: 149-157.

B-12, HOMOCYSTEINE, METYLMALONIC ACID, AND COGNITION IN THE ELDERLY

Previous studies have found patients with low vitamin B₁₂ and elevated serum folate concentrations to be more likely to manifest impaired cognition than those with low vitamin B₁₂ and low serum folate concentrations. In an effort to further understand the relationship between vitamin B₁₂ and cognition, this study examined whether biochemical indicators of vitamin B₁₂, serum vitamin B₁₂, methylmalonic acid, homocysteine, and folate (serum homocysteine) insufficiency are also associated with cognitive decline.

In this observational study, 516 older adults were randomly selected from a pool of subjects involved in the Chicago Health and Aging Project. Those patients underwent cognitive testing and blood work at their initial evaluations, with cognitive testing repeated at three and six-year follow-up assessments. A subgroup of 174 underwent repeat blood work at three-year follow-up. The blood samples were tested for vitamin B12, homocysteine, methylmalonic acid, 2-methylcitric acid, and cystathionine. Blood levels were compared with cognitive function.

The subjects ranged in age from 69 to 98 years. Of those, one percent had definite, while 14.2% had probable, vitamin B12 deficiency. A higher B12 level was associated with a slower decline in cognition ($p=0.005$), while a higher level of methylmalonic acid was associated with a faster cognitive decline ($p=0.004$). Homocysteine levels were not significantly associated with cognitive changes.

Conclusion: This study supports the links of vitamin B12 deficiency and elevated methylmalonic acid with cognitive decline among the elderly.

Tangey, C., et al. Biochemical Indicators of Vitamin B12 and Folate Insufficiency and Cognitive Decline. *Neur.* 2009, January 27; 72: 361-367.

ANEURYSMAL SUBARACHNOID HEMORRHAGE, SMOKING, AND FAMILY HISTORY

Current smoking and family history are known, independent risk factors for aneurysmal subarachnoid hemorrhage (aSAH). This study sought to determine whether the combination of current smoking and family history multiplies the risk of aSAH.

Adults with angiogram-confirmed aSAH were prospectively recruited. Each case was matched for age, race, and gender to three separate controls. The patients and controls were interviewed for smoking history, including pack years, and for family history of aSAH. Conditional multiple logistic regression was used to identify individual risk factors. The data were further reviewed in order to determine whether the risk was additive or multiplicative.

The 339 patients were matched

with 1,016 controls. Both current smoking ($p<0.0001$) and a family history of aSAH ($p<0.03$) were independently associated with the development of aSAH. A test for multiplicative interaction was not significant ($p<0.80$). However, the interaction contrast ratio was significant, at 2.19, suggesting more than a mere additive effect.

Conclusion: This study suggests a gene-environment interaction between current smoking and family history in aneurysmal subarachnoid hemorrhage.

Woo, D., et al. Smoking and Family History and Risk of Aneurysmal Subarachnoid Hemorrhage. *Neur.* 2009; January; 72: 69-72.

LUMBAR SUPPORT FOR LOW BACK PAIN

Low back pain (LBP) affects up to ninety percent of adults at some point in life. Among conservative treatments, lumbar supports have been recommended to prevent and/or reduce LBP. However, the data regarding the effectiveness of that intervention remain equivocal. Therefore, this study further explored the efficacy of lumbar supports.

This prospective, randomized, controlled trial included 197 patients with subacute back pain. The subjects were randomized into two groups, one wearing a lumbar support belt and the other serving as a control. The support belt was an elastic textile lumbar belt with crossed bands and posterior metallic reinforcement. The participants were instructed to wear the belt for the entire day. Outcome measures included functional recovery (as measured by the EIFEL Scale), change in pain intensity, and medication consumption at thirty, sixty, and ninety days.

Participants in the treatment group realized significantly greater reductions in EIFEL Scale scores at both thirty and ninety days than did the control group ($p=0.022$ and $p=0.023$, respectively). In addition, pain scores were lower in the treatment group than in the control group at thirty and ninety days ($p=0.038$ and $p=0.002$, respectively). The treatment group further reported less pain medication consumption at ninety days than did the controls

($p=0.002$).

Conclusion: This study of patients with subacute low back pain supports the use of lumbar belts to improve function, pain, and medication consumption.

Calmels, P., et al. Effectiveness of a Lumbar Belt in Subacute Low Back Pain. *Spine.* 2009, February; 34: 215-220.

CARPAL TUNNEL SYNDROME TRENDS

Carpal tunnel syndrome (CTS) is a common disease with significant socioeconomic impact. While the incidence of CTS appears to be increasing, the factors leading to that finding are unclear. This study sought to clarify temporal trends in the incidence of CTS and in surgical interventions.

This retrospective review identified new cases of CTS from 1981 through 2005. Those cases were identified by ICD-9 codes for CTS and by first-time carpal release. Data were obtained using the Rochester Epidemiology Project database, a medical database of illnesses in Olmsted County Minnesota. Rates of work-related CTS resulting in more than three days' loss of work were provided by the Minnesota Department of Labor and industry.

Overall, 10,069 individuals had a diagnosis of CTS. The annual CTS incidence increased from 258 per 100,000 during the period of 1981 to 1985, to 424 per 100,000 during the period of 2000 to 2005 ($p<0.0001$). Surgical intervention for CTS, while decreasing initially, rose to an incidence of 129 per 100,000 in the final decade, especially in the older population. Work-related CTS increased from 1981 to 1985, but declined toward the end of the study.

Conclusion: This study suggests that the overall incidence of carpal tunnel syndrome increased between 1981 and 2005, with that increase disproportionately affecting the older population.

Gelfman, R., et al. Long-Term Trends in Carpal Tunnel Syndrome. *Neur.* 2009, January 6; 72(1) 33-41.

CONTINUOUS PASSIVE MOTION AND ADHESIVE CAPSULITIS

Frozen shoulder is defined as a clinical condition involving restricted active and passive range of motion in all directions. With early descriptions of synovial changes in the glenohumeral joint, this condition has subsequently been described as adhesive capsulitis. Continuous passive motion (CPM) is an established method of preventing and treating joint stiffness. This study sought to determine the response of adhesive capsulitis to CPM.

This trial included 57 patients with primary frozen shoulder. Those subjects were randomized to receive either daily CPM treatment or a physiotherapy protocol. The 29 patients in the CPM group underwent treatments gradually increasing motion for one hour per day for twenty days. The second group underwent daily physiotherapy treatment, including shoulder stretching and pendulum exercises, for one hour per day for twenty days.

All subjects were evaluated for range of motion and symptoms of pain at rest, pain with movement, and pain at night. At weeks four and twelve the data demonstrated significant improvement on all parameters for both groups. However, pain reduction was significantly better in the CPM group.

Conclusion: This study of patients with idiopathic frozen shoulder revealed that continuous passive motion may be effective for reducing pain, but was no better than physiotherapy for increasing range of motion.

Dundar, U., et al. Continuous Passive Motion Provides Good Pain Control in Patients with Adhesive Capsulitis. *Int J Reh Res.* 2008, February 26.

ARTHROSCOPIC TREATMENT OF TRIANGULAR FIBROCARILAGE WRIST INJURY

Triangular fibrocartilage (TFC) injuries are increasingly recognized as a cause of ulnar sided wrist pain. Current management typically consists of immobilization, physical therapy, and corticosteroid injections. This study evaluated the results of arthroscopic treatment of those

injuries in high-level athletes.

Sixteen, competitive athletes who had failed non-operative treatment for TFC wrist injuries underwent arthroscopic surgery. Each patient underwent surgical debridement and/or repair, based upon the stability and location of the injury. Specifically, eleven underwent debridement with repair, while five underwent debridement alone. Postoperatively, the participants experienced six weeks of immobilization, followed by progressive range of motion and strengthening exercises. The primary outcome measure was a questionnaire quantifying physical symptoms and upper limb function (the Mini-DASH).

At an average follow-up of 32.8 months, mean Mini-DASH scores improved from 47.3 to zero ($p=0.002$). Mean Mini-DASH sports module scores improved from 79.7 to 1.95 ($p=0.002$). Time to return to play averaged 3.3 months. Of the two athletes unable to return to play at three months, one had ulnar carpal abutment/distal radioulnar joint instability, and the other extensor carpi ulnaris tendonosis/distal radioulnar joint instability. All athletes reported that they were pain-free during all functional activities of daily living.

Conclusion: This study of patients diagnosed with triangular fibrocartilage wrist injury demonstrates that arthroscopic debridement and/or repair is a reasonably successful procedure for elite athletes who do not respond to non-operative treatment.

McAdams, T., et al. Arthroscopic Treatment of Triangular Fibrocartilage Wrist Injuries in the Athlete. *Am J Sp Med.* 2009, February; 37: 291-297.

ACTIVITY AFTER TOTAL ANKLE ARTHROPLASTY

The development of modern implants for total ankle arthroplasty (TAA) has improved surgical results. However, limited data exist concerning the clinical and radiographic outcomes of those patients. Thus, this study evaluated the effect of TAA on return to sport.

Over a three-year period, two surgeons performed 155 TAAs on 137 consecutive patients. The primary diagnoses were of

posttraumatic ankle osteoarthritis (OA) in 47 patients (46.5%), primary ankle OA in 35 patients (34.7%), and inflammatory ankle OA in 19 patients (18.8%). After surgery, the patients underwent regular clinical and radiographic follow-ups at six weeks, three months, twelve months, and yearly thereafter.

Activity levels were assessed with the University of California at Los Angeles (UCLA) Activity Scale. Habitual physical activities were surveyed using the International Physical Activity questionnaire. The American Orthopedic Foot and Ankle Society Hind Foot Scale served as a clinical outcome measure.

Preoperatively, 62.4% of the patients were active in sports, whereas 66.3% were active after surgery ($p=0.56$). According to the UCLA scale, activity levels increased significantly after TAA ($p<0.01$). Seventy-nine percent met the criteria for health enhancing physical activity. The lowest levels of physical activity were seen among those with a history of inflammatory OA and those with comorbid medical conditions.

Conclusion: This study of patients undergoing total ankle arthroplasty revealed that two thirds were active in sports after surgery, and that routine activity increased after surgery.

Fuchs, S., et al. Habitual Physical Activity and Sports Participation after Total Ankle Arthroplasty. *Am J Sp Med.* 2009, January; 37(1): 95-102.

VENOUS THROMBOEMBOLISM RISK AFTER ELECTIVE SPINAL SURGERY

The incidence of thromboembolic disease following spinal surgery is not as well understood as that following other types of major orthopedic surgeries. This study reviewed the relevant literature, in an effort to better clarify the thromboembolic risk to patients undergoing elective spinal surgery.

An online search was used to query the MEDLINE database. Studies pertaining to anticoagulation, deep vein thrombosis, pulmonary embolism, or thromboembolic disease following spinal surgery were included. Each article was graded for its level of evidence. A total of 25 articles satisfied all inclusion criteria,

with data extracted from those studies for full review.

After pooling the data from the chosen studies, the overall rate of DVT was found to be 2.1%. Comparing that incidence by prophylaxis method, no prophylaxis resulted in an incidence of 2.7%, compression stockings 2.7%, pneumatic sequential compression devices 4.6%, compression stockings combined with pneumatic sequential compression devices 1.3%, chemical anticoagulants 0.6%, and inferior vena cava filters 22%.

Conclusion: This review of studies focusing on patients undergoing elective spinal surgery revealed that combining compression stockings and sequential compression devices can result in significantly fewer DVTs than does either intervention alone. Chemical anticoagulation produced the best risk reduction.

Glantzbecker, M., et al. Thromboembolic Disease in Spinal Surgery: A Systematic Review. *Spine*. 2009, February 1; 34: 291-302.

BOTULINUM TOXIN FOR SIALORRHEA IN ALS

Amyotrophic lateral sclerosis (ALS) is a progressive, neurodegenerative disease. Sialorrhea is reported in approximately fifty percent of patients with ALS. Salivary gland botulinum toxin injections have been suggested as a possible treatment for this disorder. This study sought to determine the benefit and safety of botulinum toxin type B injections for patients diagnosed with ALS related sialorrhea.

This double-blind, randomized, placebo-controlled trial included twenty patients with ALS who presented with sialorrhea, refractory to medical treatment. Each subject was randomized to an active treatment group or a placebo group. In the active treatment group, botulinum toxin B was injected into each of the submandibular glands at 750 units per gland. Electromyographic guidance assured that the needle placement was not in the surrounding musculature.

The control group received a similar volume of saline. Outcomes

measures included global impressions of change, patients' and caregivers' subjective assessments of benefit, change in volume of saliva, scores on a revised ALS functional scale and on a short individual quality of life measure, with all measures obtained at baseline and at two, four, eight, and twelve weeks

Patients who received botulinum toxin B reported a significantly higher, average global impression of improvement at two and four weeks than did the placebo group. At eight weeks, however, that finding failed to reach significance ($p=0.153$). Significant decreases in saliva volume were noted at two and four weeks. At twelve weeks, fifty percent of the subjects who had received botulinum toxin B continued to report improvement. No significant, adverse effects were reported, including no significant dysphagia or decreased vital capacity.

Conclusion: This study of patients with amyotrophic lateral sclerosis suggests that the botulinum toxin type B may be beneficial in the treatment of medically refractory sialorrhea.

Jackson, C., et al. Randomized, Double-Blind Study of Botulinum Toxin Type B for Sialorrhea in ALS Patients. *Musc Nerve*. 2009, February; 39: 137-143.

RECOVERY OF MUSCLE AND BONE AFTER BED REST

Bone mass is readily lost from immobilized limbs under conditions such as spinal cord injury (SCI), space flight, and bed rest. However, recent studies have suggested that those losses can recover when complete functional rehabilitation is achieved. This study sought to better understand the recovery of muscle atrophy and bone loss after ninety days of bed rest.

The study tested two countermeasures designed to prevent muscle atrophy and bone loss during ninety days of strict bed rest. Twenty-five, young, healthy adults were randomly assigned to one of the two countermeasure groups.

The first countermeasure was flywheel resistive exercise, which included supine squatting exercise and calf raises, performed two to three times per week. A second

countermeasure, targeting at bone only, consisted of administration of a single intravenous infusion of 60 mg pamidronate, an inhibitor of bone resorption, fourteen days prior to the onset of bed rest. Measurements of muscle were taken after bed rest and at 180 and 360 days' follow-up. Outcome measures included peripheral quantitative computed tomography, markers of calcium and bone metabolism, and assessment of habitual physical activity.

In both groups, within one year, diaphyseal bone mineral content had returned to baseline values or even slightly above ($p=0.016$). Epiphyseal bone loss had not completely recovered at one year ($p<0.034$). Recovery of calf muscle cross-sectional area and resumption of impact sports activity seemed to precede bone recovery.

Conclusion: This one-year follow-up of patients undergoing ninety days of complete bed rest revealed that, with chemical or mechanical intervention, bone loss recovered completely at the tubule diaphysis, with recovery almost complete at the epiphysis.

Rittweger, J., et al. Recovery of Muscle Atrophy and Bone Loss from Ninety Days of Bed Rest: Results from a One-Year Follow-Up. *Bone*. 2009, February; 44: 214-224.

PROTECTIVE EFFECT OF ERYTHROPOIETIN AFTER SPINAL CORD INJURY

Following an insult to the central nervous system, primary ischemic damage ensues, followed by secondary injury. Increased local levels of erythropoietin (EPO) are commonly seen immediately after trauma to the brain or spinal cord. This animal study explored the effect of EPO on functional outcome after spinal cord injury (SCI).

Thirty female rats underwent experimental T10 SCI. The animals were then divided into three groups. A low dose group received two doses of 1,000 IU each subcutaneously (SC), (EPO-L). A high dose group was administered fourteen doses of 1,000 IU each SC, (EPO-H), while a third group, who served as controls, received normal saline. The primary outcome measure was improvement in locomotion, as measured by the

Brasso scale, at six weeks.

The data revealed that the rats who received EPO obtained better locomotion scores than did the control group ($p < 0.0001$). Interestingly, comparison of the two EPO groups revealed superior, final outcomes in the group treated with a lower total dose.

Conclusion: This animal study of experimental spinal cord injury found that subcutaneous erythropoietin post-injury can improve functional outcome.

Kontogeorgakos, V., et al. The Efficacy of Erythropoietin on Acute Spinal Cord Injury. *Arch Orth Traum Surg.* 2009, February; 129 (2) 189-194.

PREDICTORS OF PERSISTENT PAIN AFTER ORTHOPEDIC INJURY

Persistent pain occurs in approximately forty percent of patients presenting to level I trauma centers with orthopedic injuries. This study sought to identify factors predicting the development of persistent, moderate or severe pain among those with a broad range of orthopedic injuries.

All patients admitted to either of two, level I trauma centers with orthopedic injuries were entered into the Victoria Orthopedic Trauma Outcomes Registry (VOTOR). At the time of acute admission, the participants completed a questionnaire regarding pain level, pre-injury health status, and demographic information. At six months post-injury, the subjects were contacted by telephone in order to determine pain levels at that point.

A total of 1,290 patients were studied. Overall, moderate or severe pain was noted by 48% of the patients at the time of discharge, and by 30% six months later. Subjects were more likely to report moderate or severe pain at six months if they had not completed high school, were eligible for compensation, reported having experienced pain related disability during the weeks before injury, or had moderate to severe pain at the time of discharge. No significant associations were found between persistent pain and age or gender.

Conclusion: This study of

patients with orthopedic injuries revealed that education level, pre-injury health, compensation status, and significant pain at discharge are risk factors for persistent pain.

Williamson, O., et al. Predictors of Moderate or Severe Pain Six Months after Orthopedic Injury: A Prospective Cohort Study. *J Ortho Traum.* 2009, February; 23(2): 139-144.

LOW TRAUMA OSTEOPOROTIC FRACTURE AND SUBSEQUENT FRACTURE

Osteoporotic fracture is a growing public health problem. The premature mortality which often follows hip or vertebral fracture is a well recognized phenomenon. Osteoporotic fracture increases the risk of subsequent fracture, although the effect of subsequent fracture on mortality risk has not been previously clarified. This study examined long-term mortality risk following osteoporotic fracture.

This longitudinal population-based study involved women and men, sixty years of age or older, in Dubbo, Australia. All fractures between 1989 and May of 2007 were followed. Of those with a fracture, 452 women and 162 men agreed to participate in a detailed assessment. Lifestyle factors, including physical activity, dietary calcium intake, tobacco abuse, and alcohol consumption, were recorded. The number of falls, anthropomorphic measures, bone density, and quadriceps strength were recorded. Fractures were confirmed by x-ray. The mortality status of all fracture participants was identified from a variety of sources.

A total of 952 low-trauma fractures followed by 461 deaths occurred among the women. In men, 343 low trauma fractures were documented, followed by 197 deaths. For each age group, mortality among those with fractures was higher than that among the general population. Absolute mortality rates were highest in the first five years following fracture, with rates declining thereafter toward the expected mortality rates.

Adjusted, standardized mortality rates increased following hip fractures (2.43), vertebral fractures (1.82), major fractures (1.65), and minor

fractures (1.42). The duration of the increased mortality risk was longest for those with hip fractures, with the increased risk present for up to ten years. Subsequent fracture was associated with increased mortality risk ratios of 1.91 in women and 2.99 in men. Mortality risk in this group remained higher for five years.

Conclusion: This study found that, for all low trauma fractures, an increased mortality risk exists for five to ten years. Subsequent fracture is associated with increased mortality for at least five years.

Blue, D., et al. Mortality Risk Associated with Low Trauma Osteoporotic Fracture and Subsequent Fracture in Men and Women. *JAMA.* 2009, February 4; 302(5): 513-521.

INFLAMMATORY MYOPATHY AND SLEEP APNEA

Constant fatigue is commonly reported among individuals with myopathies. The striated muscles of the oropharynx are known to be compromised in these diseases, potentially leading to obstructive sleep apnea (OSA). Some have speculated that this development of apnea could, in turn, contribute to fatigue. This study investigated the association between OSA and inflammatory myopathies.

This observational, prospective study enrolled sixteen adults diagnosed with idiopathic inflammatory myopathy. The subjects were evaluated using the Epworth Sleepiness Scale (ESS) and polysomnography. The Apnea-Hypopnea Index (AHI) was defined as the sum of the number of apneas plus hypopneas, divided by total sleep time. Disease was assessed with the Myositis Disease Activity Assessment Tool (MDAA) and the Myositis Damage Index (MDI). The data were analyzed to determine associations between sleep parameters and disease with the subjects followed for twelve months.

The participants' mean age was 57.5 years. The mean apnea-hypopnea index was 28.7, with fourteen patients diagnosed with obstructive sleep apnea. Three patients reported excessive daytime sleepiness. Continuous positive airway pressure was offered to seven

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patients, four of whom tolerated the procedure, with improved sleep and daytime symptoms.

No significant relationships were found between AHI scores and idiopathic inflammatory myopathy diagnosis (DM versus PM), obesity [body mass index (BMI) ≥ 30 versus BMI < 30], associated myositis autoantibodies, or the presence of dysphagia. Disease activity, as measured by the MDAA, and disease damage, as evaluated by the MDI severity score, were not significantly associated with a higher AHI.

Conclusion: This study of patients with inflammatory myopathies found a high frequency of obstructive sleep apnea in this group. Of those treated with CPAP, all improved in symptoms.

Selva-O'Callaghan, A., et al. Obstructive Sleep Apnea in Patients with Inflammatory Myopathies. *Muscle Nerve*. 2009, February; 39 (2): 144-149.

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