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ADALIMUMAB FOR ACUTE SCIATICA

Sciatica is a term often used for pain related to disc herniation. In addition to mechanical compression of the nerve root by the disc, evidence supports a role of local inflammation, particularly tumor necrosis factor alpha (TNF- α) in the pathogenesis of sciatica. This study assessed the effect of injecting adalimumab, an antibody against TNF- α , for the treatment of sciatica.

Sixty-one patients were randomized to either a treatment group or a control group. All participants had experienced clinical signs and symptoms of radiculopathy for less than 12 weeks, with a high degree of functional impairment and a concordant disc herniation. The subjects received two injections of either 40 mg of adalimumab or a placebo, administered one week apart. At three years, the patients were contacted to determine the rate of discectomy.

After a median follow-up of three years, reliable information was obtained for 56 of the patients. Of those subjects, 27.6% of the treatment group and 55.6% of the control group underwent surgical discectomy ($p=0.04$). When the improvement in back pain was analyzed over time, a significant benefit was found in favor of the adalimumab group ($p<0.0001$).

Conclusion: This study of patients with sciatica found that a short course of a tumor necrosis factor antibody (adalimumab), administered early in the course of the disease, decreased the need for surgery by more than 60% during the following three years.

Genevay, S., et al. Adalimumab in Acute Sciatica Reduces the Long-Term Need For Surgery: A Three-Year Follow-Up of a Randomized, Double-Blind, Placebo-Controlled

Trial. *Ann Rheum Dis.* 2012, April; 71(4): 560-562.

SHOCKWAVE TREATMENT FOR MEDIAL TIBIAL STRESS SYNDROME

Medial tibial stress syndrome (MTSS) is a common complaint of the lower leg in the athletic population. This study was designed to determine the effect of extracorporeal shock wave therapy (ESWT) on MTSS.

This prospective study included 42 athletes diagnosed with MTSS. Patients from one hospital were treated with a graded running program, while those from a second hospital were treated with the same running program and focused ESWT. The shockwave treatment included five treatments of 1,000 to 1,500 shocks, applied with an energy flux of 0.1 to 0.2 mJ/mm². The main outcome measure was the time to run for 18 minutes consecutively without pain.

In the treatment group, the time to full recovery was 59.7 days, while, in the control group, the time to recovery was 91.6 days ($p=0.008$).

Conclusion: This prospective, observational study of patients with medial tibial stress syndrome found that five sessions of extracorporeal shockwave therapy, combined with graded running, can reduce recovery time.

Moen, M., et al. Shockwave Treatment for Medial Tibial Stress Syndrome in Athletes: A Prospective, Controlled Study. *Br J Sports Med.* 2012, March; 46: 253-257.

GLEMOHUMERAL JOINT PENETRATION WITH A 1.5 INCH NEEDLE

Two common approaches for accessing the glenohumeral joint for injections include the anterior and the

posterior approach. The recommended needle for the posterior approach is a standard 21 gauge 1.5 inch needle. This study compared the anterior and posterior approach for reliability in penetrating the glenohumeral joint.

Seventy-nine patients scheduled for arthroscopic glenohumeral joint injection were consented for this study. During the surgery, the depth from the skin to the joint capsule was measured using direct visualization to determine joint penetration. The posterior approach was 10 mm inferior and medial to the posteriolateral tip of the acromion, aiming towards the coracoid process. The anterior approach was just lateral to the coracoid.

The mean skin to joint capsule depth was 43.5 mm with the posterior approach and 27.1 mm with the anterior approach. The distance from the skin to the joint capsule was less than the length of a standard needle in 78 of the 79 (98.7%) patients through the anterior approach, but in 15 of the 79 (19%) patients through the posterior approach.

Conclusion: This study found that the distance from the skin to the glenohumeral joint capsule exceeds the length of a standard 1.5 inch injection needle over 80% of the time using the posterior approach but in less than 2% of the time using the anterior approach.

Tong, A et al. Glenohumeral Joint Penetration with a 21 Gauge Standard Needle. *J Shoulder Elbow Surg.* 2012, dx.doi.org/10.1016/j.jse.2011.11.034.

LAQUINIMOD FOR MULTIPLE SCLEROSIS

Laquinimod is an oral quinalone-3-carboxamide derivative which has been found to reduce inflammatory cell infiltrates in the central nervous system, decreasing demyelination

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and preventing axonal loss. This study evaluated the safety, efficacy and tolerability of oral laquinimod for patients with relapsing remitting multiple sclerosis (MS).

Patients with a diagnosis of MS, with a relapsing remitting course, were recruited from 139 sites in 24 countries. All had a disease duration of at least six months before screening. The subjects were randomly assigned to receive oral laquinimod at 0.6 mg once per day or an identical appearing placebo. The patients were assessed with the Kurtzke Expanded Disability Status Scale (EDSS) every three months with MS functional composite scores every six months, and MRI annually. The primary endpoint was the number of confirmed relapses. Secondary endpoints included disability progression, as measured by scores on the EDSS and the Multiple Sclerosis Functional Composite (MSFC).

A total of 550 patients were assigned to the laquinimod group and 556 to the placebo group. The mean, annualized relapse rate during the 24-month treatment period was significantly lower in the laquinimod group than in the placebo group ($p=0.002$). The percentages of patients who were relapse free were 62.9% in the laquinimod group and 52.2% in the placebo group ($p<0.001$). The risk of disability progression was significantly decreased for patients receiving laquinimod, as compared to those receiving placebo ($p=0.01$).

Conclusion: This study of patients with relapsing remitting multiple sclerosis demonstrates that laquinimod, given once daily, can slow the progression of disability and reduce the rate of relapse.

Comi, G., et al. Placebo-Controlled Trial of Oral Laquinimod for Multiple Sclerosis. *N Eng J Med.* 2012, March 15; 366(11): 1000-1009.

INTRAMUSCULAR MIDAZOLAM VERSUS INTRAVENOUS LORAZEPAM FOR STATUS EPILEPTICUS

The mainstay of treatment for status epilepticus has been intravenous (IV) lorazepam. However, many emergency medical services (EMS) systems have begun to use intramuscular (IM) midazolam, rather

than an intravenous agent, largely because IM administration is faster and is consistently achievable. This study compared those two treatments.

This double-blind, randomized trial included 4,314 paramedics, 33 EMS agencies and 79 hospitals across the United States. Patients were included if their convulsions had persisted for more than five minutes, and they continued convulsing upon arrival of the paramedics. Patients were randomized to receive either five to 10 mg of IM midazolam, followed by an IV placebo, or IM placebo, followed by two to four mg of IV lorazepam. The dose was determined by patient weight. The primary outcome measure was the absence of seizures upon arrival at the emergency department (ED), without the need for rescue therapy.

Upon arrival at the ED, seizures were absent in 329 of the 448 (73.4%) patients in the IM midazolam group, and in 282 of the 445 (63.4%) patients in the lorazepam group ($p<0.001$). Among the subjects in the intravenous group who did not reach the primary outcome, 31 never received the study medication due to failure to obtain vascular access. The proportion of subjects admitted to the hospital was significantly lower in the IM group than in the IV group ($p=0.01$).

Conclusion: This study of patients with status epilepticus found that intramuscular midazolam is as effective as intravenous lorazepam for the cessation of seizures during transport to the hospital.

Silbergleit, R., et al. Intramuscular versus Intravenous Therapy for Pre-Hospital Status Epilepticus. *N Engl J Med.* 2012, February 16; 366(7): 591-600.

SHOULDER INJECTIONS WITH AN ANTERIOR APPROACH

The accuracy rates for intra-articular corticosteroid injections have ranged from 10 to 42% in the clinical setting. This study sought to determine the accuracy of intra-articular glenohumeral injections.

Seventy-five, consecutive patients, all scheduled to undergo shoulder arthroscopy, were included in this study. The needle entry site was 1.0 to 1.5 cm lateral to the coracoid at the anterior superior joint

line, with the needle placed at 45° relative to the floor. During surgery, a 21 gauge, 1.5 inch needle was passed into the glenohumeral joint, where 5-10 cc of sterile saline was injected. The needle was left in place while arthroscopy was initiated. The arthroscope was then inserted using a posterior portal. The needle was considered to be within the joint when fluid was expressed from the islet of the needle at the time when the arthroscopy pump was turned on, or when direct visualization of the needle was made.

The needle was visualized with the arthroscope in all patients. In 70 patients, fluid was expressed through the islet of the needle while the arthroscope pump was turned on. In the five of the patients in whom fluid was not expressed, the needle was intra-articular and was resting against bone or soft tissue.

Conclusion: This study suggests that an anterior approach to an intra-articular glenohumeral joint injection can be performed accurately without radiologic assistance.

Kraeutler, M., et al. Accuracy of Intra-Articular Injections of the Glenohumeral Joint through an Anterior Approach: Arthroscopic Correlation. *J Shoulder Elbow Surg.* 2012, March; 21(3): 380-383.

HYALURONIC ACID INJECTIONS FOR SUBACROMIAL IMPINGEMENT

Subacromial impingement syndrome (SIS) is a soft tissue impingement between the coracoacromial arch and the greater tuberosity of the humeral head. While steroid injections are thought to be safe, some concern persists regarding the risk of damage when used around a tendon. This study was designed to assess the safety and efficacy of high-molecular weight hyaluronate injections for the treatment of SIS.

This multicenter, randomized, single-blind study included 105 patients who had been diagnosed with SIS without rotator cuff tear. All had suffered from pain for at least three months without improvement, despite conservative treatment. The subjects were divided into two groups. One group received hyaluronic acid injections once weekly for three weeks, while the

other received a single corticosteroid injection. All injections were guided by ultrasound. Patients were assessed for range of motion, function, using the American Shoulder and Elbow Surgeons standard shoulder assessment form (ASES), and for pain, using a visual analogue scale. The numbers of patients who required rescue medication were documented at three, six and 12 weeks post-injection.

At 12 weeks, both treatment groups reported decreased pain scores, with significantly more pain relief in the hyaluronic acid group than in the steroid group ($p=0.018$). ASES scores improved in both groups, with no significant difference between the two. In addition, no difference was seen between the groups in number of patients requiring rescue medication.

Conclusion: This study of patients with subacromial impingement syndrome found slightly better pain scores in those treated with hyaluronic acid than in those treated with corticosteroid, with no difference in functional outcome or in the use of rescue pain medication.

Kim, Y., et al. Does Hyaluronate Injection Work in Shoulder Disease in Early Stage? A Multicenter, Randomized, Single-Blind and Open Comparative Clinical Study. *J Shoulder Elbow Surg.* 2012, <http://dx.doi.org/10.1016/j.jse.2011.11.009>.

OSTEOCHONDRAL TALAR DOME LESIONS

Osteochondral lesions (OCLs) of the talus are an infrequent injury that may either heal spontaneously or progress to chronic symptoms of deep joint pain, worse upon weight bearing and exercise. This study evaluated the effect of platelet rich plasma (PRP) and hyaluronic acid injections for the treatment of these lesions.

This randomized, controlled trial included 29 patients with 30 symptomatic OCLs of the talus, all of which had failed to respond to previous treatment modalities. The participants were randomized to receive either hyaluronic acid or PRP. Group 1 received weekly injections of sodium hyaluronic solution of 2 mL for a total of three injections. Group 2 received one injection of two mL of

PRP. The primary efficacy measures were the modified Ankle-Hindfoot Scale (AHFS) and a visual analog scale (VAS), completed by the patients at each visit.

Both groups demonstrated improved function as measured by the AHFS, with greater improvements noted in the PRP group ($p<0.05$). In addition, those in the PRP group obtained better scores on the VAS for stiffness and function, as measured at 28 weeks ($p<0.05$ and $p<0.01$, respectively). Subjective global function scores also improved more in the PRP group ($p<0.01$).

Conclusion: This study of patients with osteochondral lesions of the talus found that injections of platelet rich plasma and hyaluronate can improve the outcome, with better outcomes realized with platelet rich plasma.

Mei-Dan, O., et al. Platelet Rich Plasma or Hyaluronate in the Management of Osteochondral Lesions of the Talus. *Am J Sports Med.* 2012, March; 40: 534-541.

RESISTANCE TREATMENT FOR RHEUMATOID ARTHRITIS

Impairment in range of motion and muscle strength can increase rheumatoid arthritis (RA) associated disability and adversely impact the patient's quality of life. As decreases in joint mobility and muscle strength prevent patients from performing regular physical activities, this disease often leads to further muscle deconditioning and exercise intolerance. This meta-analysis was designed to clarify whether resistance exercise is effective as a treatment of patients with RA.

This meta-analysis involved randomized, controlled trials included in the Cochrane database. Ten studies met the criteria for review. Resistance exercises were categorized as repetitive exercises designed to improve muscle strength through the use of resistance. Outcome measures included grip strength, disability ratings using the Health Assessment Questionnaire (HAQ), functional capacity, tender/swollen joint count, pain ratings using a visual analog scale, laboratory values, exercise tolerance and radiological imaging of damage.

Resistance exercise was associated with a positive effect on

functional capacity ($p=0.001$), a decreased tender/swollen joint count ($p=0.004$), a trend toward a positive effect on VAS pain ($p=0.24$), a significant decrease in ESR ($p=0.005$), and impairment ($p=0.001$). No statistical difference was found in the number of adverse events between treatment and control groups.

Conclusion: This systematic review and meta-analysis found that, for patients with rheumatoid arthritis, resistance exercise can decrease disability and improve functional capacity.

Baillet, A., et al. Efficacy of Resistance Exercises in Rheumatoid Arthritis: Meta-Analysis of Randomized, Controlled Trials. *Rheumatology*, 2012, March; 51(3): 519-527.

CLOSURE OR MEDICAL THERAPY FOR PATENT FORAMEN OVALE

Up to 40% of acute ischemic strokes have no identifiable cause and are classified as cryptogenic. Some of these events may result from an embolus from the venous system, traversing from the right to the left atrium through a patent foramen ovale. The ideal strategy for secondary prevention for patients who present with cryptogenic stroke or transient ischemic attack (TIA) and have a patent foramen ovale is not clear. This study compared the efficacy of closure with a percutaneous device with that of medical therapy for treating this condition.

Subjects were patients with a history of an ischemic stroke or TIA within the prior six months who had evidence of a patent foramen ovale. The participants were randomized to either closure with a percutaneous device plus antiplatelet therapy, or to receive medical therapy alone.

Patients assigned to the medical treatment group were treated with warfarin, with a target international normalized ratio of 2-3, aspirin at 325 mg per day or both. Assessments of clinical endpoints and adverse events were made at one, six, 12 and 24 months. The primary endpoint was a composite of stroke or TIA in the two-year follow-up period, death from any cause during the first 30 days or death from neurologic causes between 31 days and two years.

Between 2003 and 2008, 447 patients were randomized to the closure group and 462 to the medical group. The cumulative rates of the primary endpoint after two years were 5.5% in the closure group and 6.8% in the medical therapy group ($p=0.37$). The two-year rates of stroke were 2.9% in the closure group and 3.1% in the medical therapy group ($p=0.79$). There were no significant differences in the rates of serious adverse events between the two groups. However, atrial fibrillation was significantly more frequent in the closure group than in the medical-therapy group ($p<0.001$).

Conclusion: This study of patients with cryptogenic stroke or transient ischemic attack who have a patent foramen ovale found no significant difference in recurrent stroke between those treated with closure and those treated with medical therapy alone.

Furlan, A., et al. Closure or Medical Therapy for Cryptogenic Stroke with Patent Foramen Ovale. *N Eng J Med*. 2012, March 15; 366(11): 991-999.

DIETARY PROTEIN CONTENT AND WEIGHT GAIN DURING OVEREATING

People who become obese have a positive energy balance for an extended period of time. This study was designed to determine whether the level of dietary protein differentially affects body composition, weight gain and/or energy expenditure.

This randomized, parallel group study included 25 subjects, each initially placed on a weight stabilization diet. This was followed by 10 to 12 weeks of overfeeding on one of three diets: low-protein (five percent of energy composition), normal protein (15% of energy composition) or high protein (25% of energy composition). All three diets were 40% above weight maintenance energy requirements. Resting energy expenditure was measured for 30 minutes each week with a ventilated hood system. Total daily energy expenditure was measured during baseline and at weeks seven to eight by the doubly labeled water method. Body composition was measured at baseline and then biweekly.

The weight gain in the low protein diet group was 3.16 kg., about half that of the other two groups ($p=0.002$). Failure to increase lean body mass in the low protein group accounted for the smaller weight gain. Overeating led to a significant increase in resting energy expenditure, as well as in total energy expenditure, in both the normal and high protein groups, but not in the low protein group.

Conclusion: This study found that overeating on a low protein diet leads to less weight gain than does a diet with normal or high protein. However, this difference was due to less gain in lean muscle, with all groups equal in fat mass gained.

Bray, G., et al. Effect of Dietary Protein Content on Weight Gain, Energy Expenditure and Body Composition during Overeating. *JAMA*. 2012, January 4; 307(1): 47-56.

EPIDURAL INJECTIONS FOR POST-SURGERY SYNDROME

Cervical spine surgery in the United States has risen dramatically over the past two decades. Even with optimistic estimations, a significant proportion of those surgeries result in failure, with residual chronic pain. Broadly categorized, these cases are referred to as cervical post-surgery syndrome. This study was designed to assess the ability of epidural injections to manage the pain of post-surgery syndrome.

This randomized, double-blind, active controlled trial involved 56 patients who had undergone cervical surgery at least one year prior to enrollment. All had chronic, function limiting neck and upper extremity pain of at least six months' duration one year after surgery. The subjects were randomized to receive intra-laminar cervical injections, with group one receiving five mL of five percent lidocaine and group two receiving four mL five percent lidocaine with one mL of betamethasone. The patients were scored for pain at baseline and at three, six and 12 months after treatment. Significant pain relief was defined as greater than 50% relief as compared with baseline.

At 12 months, significant pain relief was found in 71% of group one and in 68% of group two ($p=0.465$), with functional status improvement

seen in 71% of the patients in group one and 64% in group two.

Conclusion: This study of patients with cervical postsurgery syndrome found that epidural injections with local anesthetic, with or without steroids, may reduce pain in this population.

Manchikanti, L., et al. Fluoroscopic Cervical Interlaminar Epidural Injections in Managing Chronic Pain of Cervical Postsurgery Syndrome: Preliminary Results of a Randomized, Double-Blind, Active Control. *Trial Pain Physician*. 2012, January/February; 15(1): 13-26.

MEASURING BRAIN ACTIVITY TO TRACK RECOVERY FROM CONCUSSION

Prospective studies have demonstrated that the vast majority of athletes achieve a complete recovery from symptoms, cognitive dysfunction and other impairments within seven to 10 days of a concussion. This study was designed to explore the utility of an index based upon brain electrical activity to identify longitudinal changes in brain functioning after a concussion.

Male football players from eight high schools and two colleges were enrolled prior to the 2008 and 2009 football seasons. A total of 59 players who had sustained a concussion were compared with 31 matched, non-injured athletes. All injured players completed a brief battery of sideline tests assessing symptoms, cognitive functioning and postural stability. In addition EEG recordings from five frontal electrode sites were obtained from each subject. The tests were administered at the time of injury and at eight and 45 days post-injury. Upon reviewing the electrical activity, a classification algorithm was constructed, using a weighted combination of selected linear and non-linear features of brain electrical activity, which mathematically describe the profile of TBI as distinguished from normal brain activity. The result was expressed as a discriminant score (MTBI-DS) or as an index (ranging from 0–100).

The MTBI-DS was greater in the concussed group than in the control group on the day of injury ($p=0.0004$) and on day 8 ($p=0.008$). The two groups did not differ on day 45 ($p=0.15$). The abnormalities in

brain electrical activity extended beyond the point at which the athletes had achieved a full recovery on clinical measures of post-concussion symptoms, cognitive functioning and postural stability.

Conclusion: This study contributes to the data suggesting that the duration of physiological recovery after concussion may be longer than the observed period of clinical recovery.

Barr, W., et al. Measuring Brain Electrical Activity to Track Recovery from Sport Related Concussion. *Brain Inj*. 2012, January; 26 (1): 58-66.

INCIDENCE OF REPEAT SURGERY AFTER ANTERIOR CERVICAL DISKECTOMY AND FUSION

Adjacent segment disease (ASD) after anterior cervical discectomy and fusion (ACDF) has gained attention in the past decade. However, the frequency and clinical significance of ASD is not well understood. This retrospective study was designed to estimate the incidence of ASD after ACDF in those who undergo repeat fusion surgery.

Data were obtained from the National Health Insurance Research Database (NHIRD), including all claims data from Taiwan's national health insurance program. The study's sample was obtained over the years from 1997 through 2007. During that period, 19,385 patients underwent ACDF surgery. Among those receiving the first surgery, 568 patients underwent a second ACDF surgery, and 29 underwent three or more surgeries.

At the end of the ten-year cohort trial, 94.4% of patients who received one ACDF did not seek a second surgery. Among those who did, the average time from first to second surgery was 23.3 months. The overall incidence of secondary ACDF surgery due to cervical disk disease was 7.6 per 1,000 patient years (0.8%). Males and patients ages 15 to 59 were more likely to undergo a second surgery.

Conclusion: This study of patients undergoing anterior cervical discectomy and fusion for cervical disk disease found that the annual rate of secondary ACDF surgery was approximately 0.8%, with 5.6%

undergoing repeat surgery within ten years.

Wu, J., et al. The Incidence of Adjacent Segment Disease Requiring Surgery after Anterior Cervical Discectomy and Fusion: Estimation Using an 11-Year, Comprehensive, Nationwide Database in Taiwan. *Neurosurg*. 2012, March; 70(3): 594-601.

SAFETY OF ARTHROCENTESIS AND JOINT INJECTION DURING ANTICOAGULATION

While many people who are receiving anticoagulant therapy require arthrocentesis, there is often a reluctance to perform the procedure due to the concern for bleeding. However, reversing or stopping anticoagulation therapy may place the patient at risk for a thromboembolic event. This study was designed to determine the safety of arthrocentesis or joint injection in a group of patients receiving chronic, oral warfarin therapy.

This retrospective chart review included 640 arthrocentesis and joint injection procedures performed in 514 patients between 2001 and 2009. All patients were receiving chronic warfarin therapy. The charts were divided between those for whom warfarin therapy was continued, to maintain an international normalized ratio (INR) in the therapeutic range (Group A), and those for whom warfarin was discontinued three to five days before the procedure, or for whom the INR was corrected by coagulation factors or vitamin K (Group B). In group B, procedures were performed when the INR was less than two. The charts were reviewed for the incidence of early and late clinically significant bleeding in or around the joint, as well as for infection and procedure related pain.

A total of 456 procedures were performed with the INR of two or greater and 184 performed with the INR of less than two. In group A, 22.5% of the procedures were performed in patients with an INR of greater than three. Group A had a mean INR of 2.7 and group B had a mean INR of 1.6. No significant difference was seen between the two groups in rates of early and late significant bleeding. Further, no significant difference was found between the two groups in rates of

early and late infection or pain in the joints.

Conclusion: This retrospective study of patients receiving arthrocentesis or joint injections during anticoagulation found no increased risk of clinically significant bleeding or joint infection with an international normalized ratio above two.

Ahmed, I., et al. Safety of Arthrocentesis and Joint Injection in Patients Receiving Anticoagulation at Therapeutic Levels. *Am J Med.* 2012, March; 125(3): 265-269.

NEOVASCULAR SCLEROSING FOR PATELLAR TENDINOPATHY

Sclerosing injections for insertional tendinopathies have become widely accepted in clinical practice, although perhaps ahead of scientific evidence. This study evaluated medium and long-term outcomes in a large number of patients undergoing sclerosing injections for patellar tendinopathy.

One hundred one patients with patellar tendinopathy of at least three months' duration, and with evidence of neovascularization in the painful area, were studied. The participants received up to five, ultrasound guided injections of polidocanol at four to six week intervals. Repeat injections were offered to patients who were not satisfied and had ultrasound evidence of persistent neovascularization at follow-up. Outcomes were assessed using the Victorian Institute of Sport Assessment-Patella Score (VISA-P), a self-report questionnaire which quantifies knee function and pain. The scores were collected before treatment and at six, 12 and 24 months after the first injection. Ten patients did not report follow-up data, and were excluded from the final analysis.

At twenty-four months, the patients obtained significantly better VISA-P scores than at baseline ($p<0.001$). The greatest improvement in VISA-P scores during the follow-up period was from baseline to the six-month follow-up. No further improvement in VISA-P scores was seen from six months to the 12-month or 24-month follow-up. A VISA-P score of >95 points (of a possible 100 points) was reported in 14 cases (16%) at the 12-month follow-up, and

in 22 cases (20%) at the 24-month follow-up.

Conclusion: This prospective study found significant improvement in function and pain among patients who received polidocanol injections for patellar tendinopathy during 24 months of follow-up. However, few of the patients were cured.

Hoksrud, A., et al. Ultrasound Guided Sclerosis of Neovessels in Patellar Tendinopathy: A Prospective Study of 101 Patients. *Am J Sports Med.* 2012, March; 40(3): 542-547.

LONG-TERM LOW-DOSE STEROIDS FOR POLYMYALGIA RHEUMATICA

Polymyalgia rheumatica (PMR) is an inflammatory disease characterized by aching and morning stiffness in the shoulder and pelvic girdle. Glucocorticoids (GCs) remain the mainstay of PMR therapy. However, the side effects or comorbidities resulting from chronic, low dose use of GCs are not yet well understood. This study assessed the occurrence of comorbidities known to be possible consequences of GC.

This retrospective analysis included all patients with a diagnosis of PMR who had been followed at the author's institution. For each subject, the cumulative duration and dose of GC therapy was documented. Patients were classified as those with less than, and those with more than, two years of therapy. Clinical activity was noted at each follow-up visit. The records were reviewed for incident events, including fractures, osteoporosis, arterial hypertension, acute myocardial infarction, transient ischemic attack, stroke, and diabetes mellitus. Adverse events were defined as a new diagnosis, or as a first occurrence of any these conditions after the onset of GC therapy.

At the end of 2009, 1,429 patients were identified with a diagnosis of PMR. Of those, 222 were included in the analysis. The records revealed that 43% had experienced at least one adverse event after a mean duration of GC therapy of 31 months, and a mean cumulative dose of 3.4 g. An association was found between significantly longer duration of GC therapy and the occurrence of osteoporosis ($p<0.0001$), fragility

fractures, ($p<0.0001$), arterial hypertension ($p<0.005$) and acute MI ($p<0.05$). A higher cumulative dose of GC was also associated with the occurrence of osteoporosis ($p<0.0001$), fragility fractures ($p<0.0001$), and arterial hypertension ($p<0.01$).

Conclusion: This study of patients diagnosed with polymyalgia rheumatica found that long-term, low-dose glucocorticoid treatment is associated with serious adverse events.

Mazzantini, M., et al. Adverse Events during Long-Term, Low-Dose Glucocorticoid Treatment of Polymyalgia Rheumatica: A Retrospective Study. *J Rheum.* 2012, March 1; 39:552-557.

ELECTROMYOGRAPHY VERSUS IMAGING TO DIAGNOSE CARPAL TUNNEL SYNDROME

Electromyography (EMG) is the most commonly used diagnostic tool for assessing carpal tunnel syndrome (CTS). Imaging techniques such as computed tomography (CT), magnetic resonance imaging (MRI) and ultrasound (US) have also been used. This study compared the diagnostic accuracy of EMG, US, CT and MRI in diagnosing CTS.

Sixty-nine patients with clinically suspected CTS were studied. All participants underwent a physical examination, blood sampling and x-ray, and all were evaluated with US, CT, MRI and EMG/NCS. The US measures were recorded at the distal radioulnar joint (proximal) and at the level of the pisiform bone (distal). In CT, the cross-sectional area and median nerve density were measured at each level. On MRI, fat saturated T2W scans were evaluated for the presence of edema.

Sensitivity and specificity were 90.9% and 81.2% for EMG, 83.7% and 78.6% for US, 67.6% and 86.7% for CT and 65% and 80% for MRI. The differences in diagnostic accuracy among the tests were not significant. Of the radiologic tests, the cross-sectional area of the distal median nerve had the highest sensitivity and specificity.

Conclusion: This study, comparing imaging techniques with electro-diagnostics for the evaluation of carpal tunnel syndrome, found that

EMG had a slightly higher sensitivity and specificity than the other tests.

Deniz, F., et al. Comparison of the Diagnostic Utility of Electromyography, Ultrasonography, Computed Tomography and Magnetic Resonance Imaging in Idiopathic Carpal Tunnel Syndrome Determined by Clinical Findings. **Neurosurg.** 2012, March; 70(3): 610 -616.

TRUNCAL EXERCISES FOR ACUTE STROKE

A key to successful rehabilitation after a stroke includes regaining adaptive truncal stability. This study assessed the effect of additional trunk exercises on truncal function during rehabilitation of patients with stroke.

This blinded, randomized, controlled trial included 33 patients with stroke, all receiving multidisciplinary conventional physical and occupational therapies. In addition, a treatment group received an additional 16 hours of training focusing on trunk muscle strength, coordination and selective movements of the trunk. Patients in the control group received passive mobilization of the upper limb and transcutaneous electrical nerve stimulation of the affected shoulder. The primary outcome measures were the Trunk Impairment Scale and the Tinetti test. Secondary outcome measures included the Romberg, the Four Test Balance Scale, the Berg Balance Scale, the Rivermeade Motor Assessment Battery, and the Dynamic Gate Index.

At the end of eight weeks, both groups improved on all outcome measures. However, the treatment group improved significantly more on the Trunk Impairment Scale, the Tinetti test, the Four Test Balance Scale, the Berg Balance Scale, the Rivermeade Motor Assessment Battery and the Dynamic Gate Index ($p < 0.001$, $p < 0.001$, $p < 0.014$, $p < 0.007$, $p < 0.001$ and $p < 0.006$, respectively).

Conclusion: This study of patients with stroke found that truncal exercises, in addition to traditional rehabilitation, can improve balance and mobility.

Saeyes, W., et al. Randomized Controlled Trial of Truncal Exercises after Stroke to Improve Balance and

Mobility. **Neurorehab Neural Repair.** 2012, March/April; 26(3): 231-238.

FUNCTIONAL MAGNETIC RESONANCE IMAGING PATTERNS IN SEVERE BRAIN INJURY

Brain activity can be difficult to assess in patients with severe brain injury. Previous studies have explored the use of mental imagery tasks as proxies for overt motor responses during functional magnetic resonance imaging (fMRI). In this study, a multivariate pattern analysis (MVPA) classification was applied to fMRI data of patients following a command to imagine participating in a physical activity.

Subjects were eight, healthy controls and five patients with severe brain injury. All underwent fMRI while being asked to "imagine yourself swimming". MVPA was used to analyze the fMRI data over the entire brain, and then focusing on the supplementary motor area (SMA).

All of the control subjects showed MVPA classification rates significantly above the chance level in the whole-brain and region of interest (ROI)-masked analyses. Three of five patients with severe brain injury showed MVPA classification rates significantly above chance level. Six of eight controls demonstrated significantly increased activity in the entire brain relative to the SMA, similar to that of the three brain injury patients who had accurate responses.

Conclusion: This study provides evidence that multivariate pattern analysis is a promising approach for identifying command-following performance in patients with severe brain injury.

Bardin, J., et al. Pattern Classification of Volitional Functional Magnetic Resonance Imaging Responses in Patients with Severe Brain Injury. **Arch Neurol.** 2012, February.;69(2): 176-178.

PLATELET RICH FIBRIN MATRIX FOR ROTATOR CUFF TEARS

After arthroscopic repair of rotator cuff tears, the retear rate has been shown to be as high as 94%. Limited data exist concerning the effect of biological adjuvants to improve healing after a rotator cuff repair. This

study assessed the effect of platelet rich fibrin matrix augmentation in preventing repeat tears.

Patients were selected based upon a three-part algorithm to identify rotator cuff tears at risk for retear. Enrollment continued until a total of 20 patients received platelet rich plasma during arthroscopic repair. A control group was selected retrospectively, including patients who had undergone arthroscopic rotator cuff repairs by the same surgeons. All patients underwent a progressive post surgical rehabilitation program. Return to all activity, including sports, was allowed at an average of 20 weeks. Outcome data included clinical evaluation and MRI before surgery and at one year after.

Improvement in functional outcome scores was significant in both groups, with no significant difference between the two. MRI findings demonstrated retear rates of 56% in the treatment group and 38% in the control group ($p = 0.024$). In addition, the infection rates were 12% in the treatment group and 0% in the control group ($p = 0.15$).

Conclusion: This study found that the use of platelet rich fibrin matrix at the time of rotator cuff repair fails to improve the rate of repeat tear or improve functional outcome among those at risk for retear.

Bergeson, A., et al. Effects of Platelet Rich Fibrin Matrix on Repair Integrity of at-Risk Rotator Cuff Tears. **Am J Sports Med.** 2012, February; 40(2): 286-293.

ANATOMICAL CORRELATES OF PUSHER SYNDROME

The pusher syndrome (PS) is a disorder seen following a stroke, wherein patients push away from their non-paretic side. This study further explored the anatomical cortical regions associated with PS following a unilateral stroke and whether the tilt of the subjective visual vertical (SVV) is associated with PS.

Sixty-six patients with acute, unilateral stroke were examined using MRI with a Voxel-based lesion behavior mapping analysis. Pushing was assessed with the Scale for Contraversive Pushing (SCP). In addition, SVV was measured and comparing those with left with those

(Continued from page 2)

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comparing those with left with those with right sided lesions.

Sixteen of the 38 patients with right hemispheric stroke had PS, while only seven of the 28 patients with left hemispheric stroke had PS. Subjects with PS were found to have a more severe tilt of the SVV. Further analysis demonstrated that patients with left sided lesion had a rightward tilt of SVV and those with right side lesions had more leftward SVV tilt.

Patients with right hemisphere lesions trended toward an association between the extent of pushing and specific sites, including the posterior insula, the superior temporal gyrus and the operculum. In patients with right-sided lesions, a common association was found between the extent of pushing and the absolute degree of tilt of SVV.

Conclusion: This study of patients with stroke found that insular, opercular and temporal lesions may be involved in the control of upright body position. In addition, pusher syndrome in right hemispheric lesion patients seems to depend on vestibular otolith input.

Baier, B., et al. Pusher Syndrome: Its Cortical Correlate. *J Neurol.* 2012, February; 259(2): 277-283.

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