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TETANUS TOXIN PRESERVES SKELETAL MUSCLE

Skeletal muscle disuse results in a decrease in the volume of myofibers, with a resultant decrease in muscle force production. As the action of tetanus toxin results in increased muscle activity, this animal study was designed to determine the ability of tetanus toxin to prevent changes associated with disuse atrophy.

Female Sprague rats were divided into three groups, with all undergoing immobilization. Within the experimental groups, one group underwent tetanus toxin injection and one group underwent saline injection. A third group, receiving no injections, served as controls. Two weeks after the injections, the contractile force, muscle and myofiber morphology, as well as the tibialis anterior weight were analyzed and compared to those of the control group.

After immobilization, the wet weight of the saline group muscles decreased significantly, to 68% of the wet weight of the control muscles. The wet weight of the toxin-treated muscles maintained 98% of the wet weight of the control muscles. The maximal tetanic tension (P_o) of the toxin injected muscles did not differ from that of the control muscles. The saline group muscles developed on average only 58%/44% of the maximal twitch response (P_t)/ maximal tetanic tension (P_o) produced by control muscles. Saline group muscles developed on average only 61%/45% of the P_t/ P_o generated by the toxin injected muscles.

Conclusion: This animal study found that tetanus toxin can prevent common signs of muscle disuse atrophy.

Matthews, C., et al. Tetanus Toxin Preserves Skeletal Muscle Contractile Force and Size During Limb Immobilization. **Muscle Nerve**. 2014, November; 50(5): 759-766.

MILK INTAKE AND RISK OF MORTALITY AND FRACTURES

Increased milk intake has been promoted to prevent osteoporosis and fractures. However, as the main dietary source of D-galactose, milk has been found to have negative effects on health. Animal studies have in fact demonstrated that D-galactose may accelerate aging. This study examined the effect of milk intake on mortality and fracture risk in women and men.

In two large Swedish cohorts, 61,433 women and 45,339 men answered food frequency questionnaires. From those were obtained consumption patterns concerning milk, fermented milk, yogurt and cheese. In addition, a clinical subcohort from each of the two studies underwent urine and serum analysis for markers of oxidative stress and inflammation. Those data were compared with mortality from all causes, as well as fracture events.

The median follow-up for women was 22 years, and for men was 13 years. Among women, compared with the consumption of less than one glass per day, consumption of three or more glasses per day had a greater risk of total mortality (hazard ratio=1.93) for any fracture (hazard ratio=1.16) and for hip fracture (hazard ratio=1.60). Conversely, women with a high intake of cheese or fermented milk products had lower mortality and fracture rates compared to those with low intake ($p<0.001$). For men, the excess risk was less pronounced for mortality, with no reduction in fractures noted with increased milk intake by men. Milk intake was positively associated with 8-iso-PGF2 alpha in both genders, and with interleukin six in men.

Conclusion: This study found that higher consumption of milk in women and men is not accompanied by a lower risk of fracture, and may be associated with a higher risk of death.

Michaelsson, K., et al. Milk Intake and Risk of Mortality and Fractures in Women and Men: Cohort Studies. **BMJ.** 2014; 349: g6015.

CYTISINE VERSUS NICOTINE FOR SMOKING CESSATION

Cytisine is plant based alkaloid that is a partial agonist of nicotinic acetylcholine receptors. Cytisine has been found by previous studies to be superior to placebo for short-term and long-term abstinence from tobacco abuse. This study compared the efficacy of cytisine and nicotine replacement therapies when combined with low intensity behavioral support for smoking cessation.

This parallel group, randomized, controlled, non-inferiority trial involved adult, daily smokers, presenting for tobacco cessation therapy. All participants were offered low intensity, telephone-based behavioral support, averaging three calls of 10 to 15 minutes each, over a period of eight weeks. Those in the nicotine-replacement group were provided nicotine patches, gum, or lozenges. The type and strength of nicotine replacement therapy was determined in accordance with national smoking cessation guidelines and participant preference. Those in the cytisine group received a 25-day course of tablets. Dosing was titrated according to manufacturer's recommendations. The primary outcome variable was seven days of continuous abstinence from smoking one month after quit day.

At onset, 655 individuals were randomized to each group, with 12% lost at one month in each group. At one month, continuous abstinence rates were 40% in the cytisine group and 31% in the nicotine replacement group ($p<0.001$). At six months, continuous abstinence rates were

22% in the cytisine and 15% in the nicotine replacement group (p=0.002). Self-reported adverse events occurred more frequently in the cytisine group (p<0.001), with the most frequent of these being nausea/ vomiting and sleep disorders.

Conclusion: This study of tobacco abusers presenting for cessation treatment found that behavioral therapy, combined with cytisine, produced superior cessation rates over behavioral therapy combined with nicotine replacement therapy.

Walker, N., et al. Cytisine versus Nicotine for Smoking Cessation. **N Engl J Med.** 2014, December 18; 371(25): 2353-2362.

OPIOID USE AND ANDROGEN DEFICIENCY

Previous studies have demonstrated an association between opioid use and androgen deficiency in men with chronic pain. This study examined the association between the opioid duration of action and the risk of development of androgen deficiency.

This retrospective cohort included 1,585 men, 18 to 80 years of age. All had been dispensed 90 days of opioid prescriptions, and had at least one testosterone level measured between January 1, 2007, and December 31, 2011. The opioids were defined as either long acting or short acting. Those taking more than two different opioids during the study period were excluded. Daily doses of opioids were converted to a morphine standardized equivalent (MSE).

Bivariate analysis revealed that men who used long-acting opioids were more likely to be androgen deficient than were men taking short-acting opioids (p<0.001). In addition, men with diabetes (p<0.001), hypertension (p<0.001), hyperlipidemia (p=0.002), those taking statins (p<0.001), or those with a body mass index of at least 30 (p<0.001), were more likely to have an androgen deficiency. The median MSE for androgen deficient men was 60 mg, while the median MSE for those not androgen deficient was 40 mg.

Conclusion: This study found that, among men taking opioids, the duration of action of the opioid is inversely related to testosterone level.

Rubenstein, A., et al. Elucidating Risk Factors for Androgen Deficiency Associated with Daily Opioid Use. **Am J Med**. 2014, December; 127 (12): 1195-1201.

PROGESTERONE FOR SEVERE TRAUMATIC BRAIN INJURY

Traumatic brain injury (TBI) is a progressive disorder wherein the primary injury initiates a complex sequence/cascade of chemical metabolic changes, leading to progressive tissue damage and cell death. Progesterone has been shown to have a broad neuroprotective effect in multiple animal species and varieties of models of neurologic injury. This study assessed the efficacy of progesterone as an acute treatment for severe TBI.

This multinational, prospective, double-blind, parallel group trial included patients with severe TBI, randomized to receive either intravenous progesterone or placebo. Dosing began within eight hours of injury, with progesterone loaded at a dose of 0.71 mg per kilogram for one hour, followed by 0.5 mg per kilogram per hour for 119 hours. The subjects were monitored with laboratory values and radiographic studies. The primary outcome measure was the Glasgow Outcome Scale (GOS) score at six months post-injury. Secondary outcome measures included the GOS score at three months, mortality at one and six months and the GOS-Extended score.

Of the 1,179 patients in the modified intention to treat sample, 96% were followed for six months or died before six months. The primary endpoint, the GOS score at six months, did not differ significantly between the two groups. The proportions of patients with favorable outcomes on the GOS were 50.4% in the treatment group and 50.5% in the placebo group. No significant difference in mortality was seen between the two groups.

Conclusion: This prospective study of patients with severe traumatic brain injury found no clinical benefit of treatment with progesterone.

Skolnik, B., et al. The Clinical Trial of Progesterone for Severe Traumatic Brain Injury. **N Engl J Med.** 2014,

DOI: 10.1056/NEJMoa1411090

EARLY ADMINISTRATION OF PROGESTERONE FOR ACUTE TRAUMATIC BRAIN INJURY

More than 2.4 million emergency department visits, hospitalizations or deaths are related to traumatic brain injury (TBI) annually in the United States. Previous clinical studies of progesterone in laboratory animals indicated that the early administration of progesterone after experimental TBI can reduce cerebral edema, neuronal loss and behavioral deficits. This study was designed to determine the efficacy of the early administration of progesterone for the treatment of severe, moderate to severe or moderate TBI.

The Progesterone for Traumatic Brain Injury Experimental Clinical Treatment (PROTECT III) trial is a phase 3, randomized, double-blind, placebo-controlled, clinical trial including adults presenting to the emergency room with a TBI and with a Glasgow Coma Scale score of four to twelve upon admission. The study drug was infused continuously for a total treatment duration of 96 hours. The primary outcome measure was functional recovery, as determined by the extended Glasgow Outcome Scale at six months. Secondary outcome measures included mortality, the Disability Rating Scale score, and rates of pre-specified, adverse events.

Of the 17,681 persons screened, 8,082 patients underwent randomization. Of the patients included, 53.5% had moderate to severe injury. For the primary hypothesis, favorable outcomes occurred in 51% of the treatment group and 55.5% of the placebo group. The six-month mortality rate did not differ significantly between the treatment group and the placebo group. Phlebitis or thrombophlebitis was significantly more frequent in the treatment group than in the placebo group (relative risk=3.03).

Conclusion: This large, multicentered, clinical trial failed to demonstrate that progesterone improves the clinical outcome of patients with acute traumatic brain injury.

Wright, D., et al. Very Early Administration of Progesterone for Acute Traumatic Brain Injury. **N Engl J Med.** 2014, December. DOI: 10.1056/NEJMoa1404304

ATRIAL FIBRILLATION AND SILENT CEREBRAL INFARCTIONS

A recent meta-analysis demonstrated that atrial fibrillation (a-fib) is associated with a four- to five-fold increase in the risk of stroke, and a 40% increase in the risk of cognitive impairment. This meta-analysis was designed to better understand the association between a-fib and silent cerebral infarctions (SCIs).

Five databases were searched for observational studies involving adults with a-fib, and no clinical history of stroke or prosthetic valves. Studies eligible for inclusion reported prevalence or incidence of SCIs among patients with a-fib or for which the risk estimate could be calculated.

Eleven studies including 5,317 adults were included in the final analysis. The mean ages in the studies ranged from 50 to 83.6 years. The overall prevalence of SCI among patients with a-fib was 40% by MRI and 22% by CT. A reduction in the incidence of SCI was not found through the use of anticoagulants.

Conclusion: This meta-analysis of studies involving patients with no history of stroke found that silent cerebral infarctions can be detected on MRI in 40% of patients with a-fib, and that a-fib carries a twofold increase in the risk of SCI.

Kalantarian, S., et al. Association between Atrial Fibrillation and Silent Cerebral Infarctions. A Systematic Review and Meta-Analysis. **Annals Internal Med.** 2014, November; 161 (9): 650-658.

EARLY REHABILITATION AFTER INTRACEREBRAL HEMORRHAGIC STROKE

Previous studies have demonstrated that intracerebral hemorrhage (ICH) is more severe, and associated with worse functional outcomes, than ischemic stroke. This Chinese study compared the effects of very early rehabilitation (VER) to that of standard care for patients with ICH.

Patients presenting within 48 hours of first-time ICH were randomized to receive VER plus standard care or standard care alone. In China, standard rehabilitation care involves exercises, stretching, neuromuscular electrical stimulation and functional training, beginning one week after stroke admission.

Participants in the VER group began therapy within 48 hours of ICH onset. During that week, the standard care group received no active rehabilitation, with the main focus being medical management. The primary outcome measure was death, with secondary outcomes including the Short Form-36 Health-Related Quality-of-Life measure, the Modified Barthel Index, functional measure of activities of daily living and scores on the Self Rated Anxiety Scale.

Of the 243 patients studied, patients receiving standard treatment were less likely to be alive at six months after stroke than those in the early intervention group (hazard ratio, 4.25). While no statistically significant differences were found between groups in secondary outcome measures at three months, at six months a significant difference was found between groups on all outcome measures, favoring the intervention group. The average length of hospital stay was 10 days less in the treatment group ($p<0.001$).

Conclusion: This Chinese study of patients with intracerebral hemorrhage found that early mobilization, within 48 hours, is superior to standard care in reducing deaths and improving outcomes at six months.

Liu, N., et al. Randomized Controlled Trial of Early Rehabilitation after Intracerebral Hemorrhage Stroke. Difference in Outcome within Six Months of Stroke. **Stroke**. 2014, December; 45(12): 3502-3507.

INTRACEREBRAL HEMORRHAGE IN YOUNG ADULTS

Spontaneous intracerebral hemorrhage (ICH) accounts for up to 20% of all strokes. In older patients, these have a worse prognosis than do ischemic strokes. However, limited data exist for patients younger than 50 years of age. This study was designed to identify the clinical determinants of the short- and long-term prognosis after ICH in young adults.

Consecutive patients, ages 18 to 50 years, all with ICH and admitted to a Dutch medical center between 1980

and 2010, were studied. Patients were contacted for follow-up assessments. The Kaplan-Meier survival status was calculated until death or April of 2013. This result was compared with expected mortality of the Netherlands population, stratified by age, gender and calendar year.

Of the 98 patients the most common etiologic diagnosis among patients under 40 years of age was arteriovenous malformation, while that of patients ages 40 to 50 years was hypertension. Chance of survival up to 90 days after stroke differed significantly between those with Glasgow Coma Scale scores of three, four to nine and 10 - 15 ($p<0.001$). Among those who survived for at least 30 days, 51.3% had a poor functional outcome at discharge. The all-cause, 20-year, cumulative mortality in all patients was 31.4%. The long-term risk of death among 30 -day survivors was greater than that of age and gender matched individuals for patients ages 40 to 50 years, but not for those less than 40 years of age. The five- and 10-year cumulative incidences of recurrent ICH were 8.4% and 12.2%, respectively. Recurrence was higher among those with structural vascular malformations.

Conclusion: This study of ICH in young adults found that, among the 30 day survivors under 40 years of age, these patients have a similar risk of dying compared with the general population.

Rutten-Jacobs, L., et al. Clinical Characteristics and Outcome of Intracerebral Hemorrhage in Young Adults. **J Neurol.** 2014, November; 261(11): 2143-2149.

INTRA-ARTERIAL TREATMENT FOR ACUTE ISCHEMIC STROKE

Intravenous alteplase, administered within 4.5 hours of symptom onset, has proven efficacy in patients with acute ischemic stroke. This study assessed whether intra-arterial treatment plus usual care is more effective than usual care alone for patients with proximal arterial occlusion in the anterior cerebral circulation.

This phase 3, multicenter, clinical trial compared intra-arterial treatment (intra-arterial thrombolysis, mechanical treatment or both) plus usual care (which could include intravenous administration of alteplase).The patients were 18 years of age or older, with the acute ischemic stroke caused by an intracranial occlusion in the anterior cerebral circulation artery.

Treatment had to be possible within six hours after stroke onset. Alteplase or urokinase for intraarterial thrombolysis was allowed, with the dose restricted to 30 mg of alteplase or 400,000 IU of urokinase if intravenous alteplase was given. Mechanical treatment could involve thrombus retraction, aspiration, wire disruption or use of a retrievable stent. The primary outcome measure was the score on the modified Rankin scale at 90 days.

The mean age of the 500 study participants was 65 years. Better outcomes were noted for the intervention group in all categories of the modified Rankin scale except death. Functional independence at 90 days was noted in 32.6 % of the intervention group and 19.1% of the control group, with an adjusted odds ratio of 2.16. All clinical and imaging secondary outcomes favored the intervention group. No significant difference was seen in the occurrence of serious events during the 90-day follow-up.

Conclusion: This study of patients with acute ischemic stroke caused by proximal intracranial arterial occlusion of the anterior circulation found that better functional recovery could be achieved with intra-arterial treatment added to usual care.

Burkhemer, O., et al. A Randomized Trial of Intra-Arterial Treatment for Acute Ischemic Stroke. **N Engl J Med.** 2014. DOI: 10.1056/ NEJMoa141158

MEDICATIONS FOR DIABETIC NEUROPATHY

Diabetic neuropathy is a common, long-term complication that can decrease quality of life. While various neuropathic agents are useful for treating this pain, choosing one or the other can be challenging. This systematic review investigated the relative effectiveness of various medications used for the treatment of diabetic neuropathy.

Databases were reviewed for randomized, controlled trials published between January of 2012 and April of 2014. The trials assessed the efficacy of medications for treating diabetic neuropathy, and compared the medication to placebo or to another medication.

Sixty-five, randomized, controlled trials, including 27 medications with 12,632 patients analyzed. By drug class, SNRIs, topical capsaicin, TCAs, and anticonvulsants all resulted in larger and statistically significant reductions in pain, as compared with placebo. Head-to-head trials showed that SNRIs and TCAs reduced pain more than did anticonvulsants and topical capsaicin. Studies that evaluated long-term efficacy found that the aldose reductase inhibitors fidarestat, duloxetine and oxcarbazepine are all more effective than placebo. Indirect and direct comparisons among specific medications revealed greater pain control with carbamazepine, venlafaxine, duloxetine and amitriptyline as compared with placebo.

Conclusion: This systematic review and meta-analysis of pharmacologic interventions for painful diabetic neuropathy found that carbamazepine, venlafaxine, duloxetine and amitriptyline are significantly better than placebo for controlling pain.

Griebeler, M., et al. Pharmacologic Interventions for Painful Diabetic Neuropathy. **Ann Intern Med.** 2014, November 4; 161(9): 639-649.

DULOXETINE FOR NEUROPATHIC PAIN IN MULTIPLE SCLEROSIS

Individuals with multiple sclerosis (MS) often report neuropathic pain. Despite extensive therapies to treat this pain, few controlled studies have focused on the treatment of this condition. This study assessed the efficacy and tolerability of duloxetine for reducing pain severity in patients with MS.

This randomized, double-blind, placebo-controlled trial included 2,039 adult patients with MS who complained of neuropathic pain of at least three months' duration. Those randomized to the duloxetine treatment group received 30 mg for one week, and then 60 mg for five weeks. Those in the placebo group received placebo once daily for six weeks. The primary efficacy measure was change from baseline average

pain intensity (API) at six weeks after randomization. Secondary measures included change from baseline in the weekly mean of night pain intensity (NPI) ratings, Clinical Global Impression of Severity Scale scores, Brief Pain Inventory scores, and scores on the Multiple Sclerosis Quality-Of-Life - 54 instrument.

The mean change in weekly API ratings from baseline to week six was greater in the duloxetine group than in the placebo group (p=0.001). This difference was significant as early as week one (p=0.016), and remained significant at each subsequent week of acute phase therapy (p<0.01 for each). More patients in the treatment group withdrew from the study due to adverse events, with the most common being dizziness and somnolence.

Conclusion: This study of patients with multiple sclerosis accompanied by neuropathic pain found duloxetine to be an effective intervention for this pain.

Vollmer, R., et al. A Randomized, Double-Blind, Placebo-Controlled Trial of Duloxetine for the Treatment of Pain in Patients with Multiple Sclerosis. **Pain Practice.** 2014, November; 14(8): 732–744.

TOBACCO ABUSE AND CERVICAL SPINE SURGERY

Previous studies have demonstrated that tobacco abuse is associated with poor bone quality, lower fusion rates, delayed fusion and an increased likelihood of pseudo-arthrosis following spine instrumentation and fusion. This study was designed to better understand the effects of smoking on perioperative outcomes after cervical corpectomy.

This retrospective review included medical records between 2006 and 2011, documenting adult patients who underwent anterior cervical corpectomy as a treatment for radiculopathy or myelopathy. The patient's smoking status was categorized as current smoker, quitter (cessation at least one year prior to surgery) or non-smoker. Charts were reviewed for baseline demographic and clinical variables, as well as for comorbidities. The primary outcome measures of interest were estimated blood loss, 30-day postoperative complications and length of hospital stay.

Of the 160 adult patients included in the study, 49.4% were non-smokers, 25.6% were quitters and 25% were current smokers. Relative to non-smokers, current smokers had a higher odds ratio (OR) of experiencing complications (OR=2.87; p=0.012), while quitters did not experience such a significant increase in complications (OR=1.71; p=0.174). Current smoking was independently associated with a higher OR of pseudoarthrosis compared with non-smoking (p=0.012). Current smokers experienced mean length of stays of 9.5 days, quitters 6.8 days, and nonsmokers 4.8 days. In addition, there was a trend toward greater blood loss among smokers than non-smokers, though that finding did not reach statistical significance.

Conclusion: This study of patients undergoing cervical corpectomy found that current smokers have higher perioperative complications, longer lengths of hospital stay and higher rates of pseudoarthrosis than do non-smokers.

Lau, D., et al. The Effects of Smoking on Perioperative Outcomes in Pseudoarthrosis following Anterior Cervical Corpectomy. **J Neurosurg Spine.** 2014, October; 21: 547-558.

PLATELET RICH PLASMA FOR PRESSURE ULCERS

Pressure ulcers are one of the major, secondary complications of spinal cord injury (SCI). These ulcers can be difficult to heal, and can be a source of morbidity and even mortality. As platelet rich plasma (PRP) is considered to be an advanced wound therapy for both chronic and acute wounds, this study evaluated the effect of this treatment on patients with pressure ulcers related to a SCI.

This prospective study included 25 adult patients with SCI, each with an injury below C-4 and at least two, non-healing pressure ulcers. The larger of the ulcers was chosen for the twice weekly PRP treatment, while the smaller ulcer underwent daily saline dressing. Progress was monitored over five weeks using the Pressure Ulcer Scale for Healing, wound surface area and punch biopsies of the wound margin for histopathology.

While scores on the Pressure Ulcer Scale for Healing improved over five weeks in both groups, no significant difference was seen between the two groups. The decrease in wound surface area was significant in the PRP group, but not in the control group. At five weeks, 60% of the PRP group showed well-formed granulation tissue and epithelialization, as compared to 30% in the control group. Also at five weeks, 96% of the ulcers in the PRP group demonstrated improvement, as compared to 60% in the control group.

Conclusion: This study of patients with spinal cord injury and chronic pressure ulcers found that platelet rich plasma, applied topically to the wound may be superior to standard saline dressings for ulcer healing.

Singh, R., et al. Role of Local Application of Autologous Platelet Rich Plasma in the Management of Pressure Ulcers in Spinal Cord Injury Patients. **Spinal Cord.** 2014, November; 52(11): 809-816.

HYPERCHOLESTEROLEMIA AND FROZEN SHOULDER

Frozen shoulder is a common disorder with many known risk factors. These include systemic diseases such as thyroid disorders and diabetes mellitus. Some have suggested hyperlipidemia as a possible risk factor for frozen shoulder, noting similarities in pathologic findings between this disorder and those of Dupuytren's contracture. This study tested the hypothesis that elevated serum lipid levels are associated with frozen shoulder.

Subjects were 300 patients diagnosed with primary frozen shoulder between October of 2009 and April of 2013. The control group comprised 900 age- and gender-matched adults who presented for general checkups. The subjects were excluded if they had diabetes, thyroid dysfunction, previous shoulder surgery or trauma. All underwent laboratory evaluations, including a serum lipid profile.

A univariate analysis of serum lipid levels revealed that primary frozen shoulder is significantly associated with total cholesterol

(p<0.001), measured low-density lipoprotein (p=0.001), high density lipoprotein (p=0.001), and non-high-density lipoprotein cholesterol (p<0.001). No associations were found between serum triglyceride levels and frozen shoulder. In addition, measured hyper low-density lipoproteinemia (p<0.001), hyper high density lipoproteinemia (p<0.001) and hyper non-high-density lipoprotein cholesterolemia (p<0.001) were significantly associated with primary frozen shoulder.

Conclusion: This study found that hypercholesterolemia and inflammatory lipoproteinemia are associated with primary frozen shoulder.

Sung, C., et al. Are Serum Lipids Involved in Primary Frozen Shoulder? A Case Control Study. **J Bone Joint Surg (Am).** 2014, October; 96(21): 1828-1833.

FLUID COLLECTIONS, AMPUTATIONS AND INFECTION

Combat related amputations are often complicated by gross contamination, bacterial colonization and frequent infections. Postoperative fluid collections in amputations have been the focus of previous studies. However, there is little guidance in the literature regarding the management or clinical relevance of post-amputation fluid collections. This study was designed to better understand the frequency and clinical applications of postoperative fluid collections in combat related amputations.

This retrospective study included 300 consecutive, major lower extremity amputations treated before 2009. All patients were injured in combat operations and had sustained at least one major lower extremity amputation. Data collected included demographics, description of surgery, and clinical parameters, including white blood cell count, maximum temperature, presence of bacteremia, tachycardia and oxygen desaturation, as well as extremity examination and radiographic findings. Wound infection was defined as returning to the operating room with a positive deep wound culture.

Of the subjects included in the final analysis, 55% demonstrated fluid collection in the early postoperative period. The presence of a fluid collection on cross-sectional imaging was not associated with infection. An association was found between objective clinical signs of infection, including erythema and/or drainage, and the presence of infection (p<0.001). The only radiologic or imaging parameter significantly associated with infection was the presence of air (p = 0.027)

Conclusion: This study demonstrated that fluid collections are common in combat-related amputations, especially in the early postoperative period, and were not found to be associated with an increased risk of wound infection.

Polfer, E., et al. Fluid Collections in Amputations Are Not Indicative or Predictive of Infection. **Clin Ortho Related Res**. 2014, October; 472: 2978-2983.

OUTCOMES OF A SINGLE CORTICOSTEROID INJECTION FOR TRIGGER FINGER

Trigger finger is one the most common pain disorders, with an estimated lifetime risk of 2.6% in the general population. Prior studies have shown the success of corticosteroid injections to be in the range of 61% to 84% with one to three injections. This study investigated the long-term effectiveness of a single corticosteroid injection for trigger finger.

This retrospective case series involved successive patients treated for trigger finger from January of 2000 to December of 2007. The records were examined for primary outcome of treatment failure, defined as a subsequent injection or surgical release of the affected digit. Success was identified as an absence of symptoms at subsequent follow-up visits, or by telephone interview.

Of the 366 patients, 44% had multiple trigger fingers, and 24% were diabetic at the time of the injection. Of those, 54.6% had repeat injection or surgical release, and 45.4% had no further intervention. Treatment success occurred in 49.2% of females and 38.1% of males (p<0.05). Of those with treatment failure, 64% required repeat injection and 33% underwent surgical release. Of those with single digit trigger fingers, 50.7% had treatment success, as compared with 30.5% of those with multiple trigger fingers (p<0.05).

Conclusion: This retrospective study of patients undergoing a single corticosteroid injection for trigger finger found that 45% experienced long-term treatment success.

Wojahn, R., et al. Long-Term Outcomes following a Single Corticosteroid Injection for Trigger Finger. **J Bone Joint Surg (AM)**. 2014, November 19; 96(22): 1849-1854.

OSTEOPOROTIC COMPRESSION FRACTURES TREATED WITH A RIGID BRACE, SOFT BRACE OR NO BRACE

Benign osteoporotic compression fractures without neurologic deficits are inherently stable fractures, most often treated nonoperatively. As treatment often includes wearing an orthosis, this study compared the outcomes of patients treated with no brace, a rigid brace or a soft brace.

Sixty patients, with an average age of 72.25 years and with an acute, one-level, osteoporotic compression fracture, were randomized to receive a soft brace, a rigid brace or no brace. The patients were instructed to wear the brace at all times except when lying down, for a total of eight weeks. The primary outcome measure was the Oswestry Disability Index (ODI) score at 12 weeks after fracture.

At 12 weeks after fracture, ODI scores were 35.95 points in the no brace group, 37.83 points in the soft brace group and 33.54 points in the rigid brace group. In addition, no significant differences were found in secondary outcomes, including visual analogue scale scores for back pain and body compression ratios. No significant differences were noted among the three groups in use of opioids at 12 weeks.

Conclusion: This prospective, randomized study of patients with osteoporotic compression fractures found no difference in pain or disability scores at 12 weeks between those treated with no brace and those treated with either a soft or rigid brace.

Kim, H., et al. Comparative Study of the Treatment Outcomes of Osteoporotic Compression Fractures without Neurologic Injury Using a Rigid Brace, a Soft Brace and No Brace. **J Bone Joint Surg (AM).** 2014; 96(23): 1959-1966.

TOTAL KNEE ARTHROPLASTY OUTCOMES IN DIABETICS

Some studies have estimated that more than half of patients with diabetes mellitus have arthritis, and may eventually need a hip or a knee replacement. As several studies have demonstrated that hyperglycemia can adversely affect wound healing, the risk of poor outcomes among diabetics undergoing joint replacement is a concern. This meta-analysis was undertaken to clarify the prevalence of diabetes mellitus among patients undergoing primary total knee replacement, and to determine whether this disease impacts outcome.

A systematic search was conducted for publications between 1996 and 2014. That search yielded 14, high-quality, controlled observational studies covering 835,071 total knee arthroplasties.

The data revealed that patients with diabetes mellitus were at increased risk of deep infection [odds ratio (OR)=1.61], periprosthetic fracture (OR=1.89), aseptic loosening (OR=9.36) and worse Knee Society Function subscores (mean difference=-5.86) relative to those without diabetes.

Conclusion: This meta-analysis of studies concerning the effect of diabetes on the outcome of knee replacement found that diabetes increases the risk of infection, fracture, hardware loosening and poor outcome.

Yang, Z., et al. The Influence of Diabetes Mellitus on the Post-Operative Outcome of Elective Primary Total Knee Replacement. **Bone Joint J.** 2014; 96-B: 1637-1643.

HOME-BASED TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION WITH STROKE

After stroke, both isometric and isokinetic trunk muscle strength has been found to be impaired. As sensory input is required for motor performance and skill acquisition, this study examined whether transcutaneous electrical nerve stimulation (TENS), combined with trunk training, can enhance trunk control after stroke.

Forty-six patients with a history of stroke of at least six months' duration, and with impaired balance, were studied. All patients received task-related trunk training (TRTT).Patients in the treatment group also received treatment with a TENS unit, with electrodes placed over the latissimus dorsi and the external abdominal oblique on the affected side. For placebo stimulation (placebo-TENS) the electrical circuitry inside the TENS unit was disconnected. The subjects were assessed at baseline (A0), after three weeks of training (A1), after six weeks of training (A2) and at four weeks after intervention termination (Afu).Trunk motor control was quantified using the Trunk Impairment Scale (TIS).

Compared to the control group, both the TENS and the placebo-TENS groups showed greater improvements in average isometric peak trunk flexion and extension torques, lateral seat reaching distances and TIS scores at A1, A2, and Afu. When compared with the placebo-TENS group, the TENS + TRTT group showed earlier and greater improvement in mean TIS scores at A1 ($p<0.05$). At A2, the active TENS, but not the inert TENS group showed significant improvements in forward and lateral seated reach distance scores and TIS scores. *Post hoc* analysis revealed that both TENS groups demonstrated significant improvement in dynamic sitting balance.

Conclusion: This study found that home-based, task-related trunk training is effective for improving trunk strength, sitting functional reach and trunk motor control, with the addition of TENS units augmenting the effectiveness of these exercises.

Chan, B., et al. A Home-Based Program of Transcutaneous Electrical Nerve Stimulation and Task – Related Trunk Training Improves Trunk Control in Patients With Stroke: A Randomized Controlled Clinical Trial. **Neurehabilitation and Neural Repair**. 2015, January; 29(1): 70-79.

SEXUAL FUNCTION AND FATIGUE IN TRAUMATIC BRAIN INJURY

Sexual dysfunction occurs with significantly greater frequency among individuals with traumatic brain injury (TBI) than in the general population. This study examined the specific aspects of sexual functioning in relation to fatigue among individuals with and without TBI.

Subjects were 220 community dwelling adults with mild to severe TBI, and 83 individuals without TBI who served as controls. Subjects were assessed for sexual function with the Participation Objective, Participation Subjective (POPS) measure. Each item in that questionnaire represents a specific activity, with ratings of frequency, desired frequency, and importance of the activity to life satisfaction. Fatigue was measured with the Fatigue Assessment Instrument (FAI). Mood was measured with the Beck Depression Inventory (BDI)-Second Edition and perceived health function was measured by the Medical Outcomes Study 36-Item Short Form Health (SF-36) survey. Participants with and those without TBI were compared.

Individuals without TBI reported sex to be more important to their overall quality of life than individuals with TBI. There were no significant differences between groups in sexual frequency, desired frequency, or satisfaction. For individuals with TBI, scores on the fatigue scales were related to frequency, desired frequency and importance of sexual activity. In individuals without TBI, the impact of fatigue was limited to the frequency of sexual activity.

Conclusion: This study found that the desire for and importance of sexual activity for quality of life is closely related to several aspects of fatigue among individuals with TBI.

Goldin, Y., et al. Sexual Functioning and the Effect of Fatigue in Traumatic Brain Injury. **J Head Trauma Rehab.** 2014, September/October; 29(5): 418 -426.

RISK OF COMPLEX REGIONAL PAIN SYNDROME AFTER DISTAL RADIAL FRACTURE

The most common type of fracture in the upper extremity is the distal radial fracture. Such fractures carry a high risk of creating complex regional pain syndrome, type I (CRPS-1). This study was designed to further understand the risk of CRPS-1 among patients with these fractures.

Subjects were 477 patients with a distal radial fracture, treated surgically between July of 2010 and April of 2013. The patients were assessed for symptoms of CRPS-1 at six, 12 and 24 weeks after surgery. At follow-up, 42 patients with were diagnosed with CRPS-1. These cases were reviewed for distinguishing characteristics, including age, gender, body mass index, type of fracture, energy of

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trauma, number of trial reductions, type of surgery, and duration of immobilization.

A bivariate relationship analysis indicated that six percent of male, and 11% of female, patients had developed CRPS-1 ($p=0.02$). Those with CRPS-1 were older and more likely to have sustained a high-energy injury and to have a comminuted fracture ($p<0.02$, $p<0.02$ and $p<0.01$, respectively). Multivariate logistic analysis revealed that female gender, a severe type of fracture, and a high-energy injury contributed significantly to the development of CRPS-1.

Conclusion: This study of patients with surgically treated distal radial fractures found that gender, high-energy injury and a severe fracture type are risk factors for developing CRPS-1.

Roh, Y., et al. Factors Associated with Complex Regional Pain Syndrome Type I in Patients with Surgically Treated Distal Radius Fracture. **Arch Orthop Trauma Surg.** 2014, December; 134(12): 1775-1781.

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