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BOTULINUM TOXIN A FOR THE REPAIR OF DISTAL BICEPS TENDON RUPTURES

In patients with distal biceps tendon ruptures, surgical repair seems to be the optimal treatment. As botulinum toxin has been found to be an effective treatment option for a variety of orthopedic conditions, this study assessed the outcomes of patients who underwent distal biceps tendon repair, with the use of botulinum toxin A as an intramuscular adjunct.

During surgical repair of bicep tendons, botulinum toxin A, 100 units diluted in 10 mL of normal saline, was injected into the biceps tendon. Post- surgically, the patient was transitioned into a sling, with a five-pound weight restriction for lifting. At one month, activity was progressed to full active and passive range of motion, with the weight limit restriction removed.

Appropriate paralysis was determined in 14 of 15 patients. The average final postoperative follow-up occurred at 33.4 months. At final follow-up, 93.3% reported no pain, with DASH scores averaging 4.9. Two patients had wound infections requiring treatment, with one developing heterotopic ossification requiring surgical debridement at six months after the repair.

Conclusion: This study of patients with distal biceps tendon repair found that protective paralysis using botulinum toxin can be an effective adjunct to the surgical procedure.

Khalil, L., et al. The Utility of Botulinum Toxin A in Repair of Distal Biceps Tendon Ruptures. **Musculoskel Surg**. 2018, August; 102(2): 159-163.

MEDITERRANEAN DIET AND OSTEOARTHRITIS

Osteoarthritis (OA) is the most common cause of musculoskeletal disability in the elderly. While many studies have investigated the factors affecting joints, few have investigated the effect of diet on OA. This study investigated the association between the Mediterranean diet and morphologic parameters of the joint cartilage.

Data for this study were gathered from the Osteoarthritis Initiative database, containing information from participants residing in four cities in the United States. All had symptomatic knee OA or were at high risk for developing OA. Dietary patterns were analyzed, with adherence to the Mediterranean diet (aMED) evaluated using the Mediterranean Diet Score. Magnetic resonance imaging was completed, with those findings compared with scores on the aMED.

Subjects were 703 adults with a mean age of 62.3 years. Stricter adherence to the Mediterranean diet corresponded to better MRI findings, including a significant increase in the central medial femoral cartilage volume ($p<0.0001$), the mean central medial femoral cartilage thickness ($p<0.001$), the mean cartilage thickness of the central medial tibiofemoral compartment ($p<0.0001$) and the cartilage volume of the medial tibiofemoral compartment ($p<0.001$).

Conclusion: This study found that higher adherence to the Mediterranean diet was associated with significantly better knee cartilage scores, as assessed by magnetic resonance imaging, even after adjusting for confounding factors.

Veronese, N., et al. The Association between the Mediterranean Diet and Magnetic Resonance Parameters for Knee Osteoarthritis: Data from the Osteoarthritis Initiative. **Clin Rheum**. 2018, August; 37(8): 2187-2193

MRI-GUIDED THROMBOLYSIS FOR STROKE

This study, the Efficacy and Safety of MRI-Based Thrombolysis in Wake -Up Stroke (WAKE-UP) trial was designed to determine whether treatment with alteplase improves functional outcomes among patients with unknown time of stroke onset and a mismatch between diffusion-weighted imaging and FLAIR findings on magnetic resonance imaging (MRI).

Subjects were 18 to 80 years of age, all of whom could not report the timing of the onset of stroke symptoms, but was thought to be more than 4.5 hours. Patients were eligible who had an admission MRI revealing a mismatch between the presence of an abnormal signal on MRI diffusion-weighted imaging and no visible signal change on FLAIR in the region of the acute stroke.

Those randomized to the treatment group received 0.9 mg of alteplase per kilogram of body weight or a placebo. Clinical assessments were completed at baseline, and up to 90 days after randomization. The primary efficacy endpoint was a “favorable” clinical outcome, defined as a modified Rankin scale (MRS) score at 90 days of zero to one. The primary safety endpoints were death and a composite outcome of death or dependence, defined as an MRS of four to six at 90 days.

At 90 days, favorable outcomes were noted in 53.3% of the treatment group and 41.8% of the placebo

group (p=0.02). The median scores on the MRS at 90 days were one in the alteplase group and two in the placebo group (p=0.003). Death or inability to live independently occurred in 13.5% of the alteplase group and in 18.3% of the placebo group (p=0.17). Symptomatic intracranial hemorrhage was found in two percent of the treatment group and in 0.4% in the placebo group (p=0.15).

Conclusion: This study of patients with acute stroke with an unknown time of onset found that intravenous alteplase, guided by a mismatch between diffusion-weighted imaging and FLAIR in the region of ischemia, resulted in significantly better functional outcome at 90 days.

Thomalla, G., et al. MRI-Guided Thrombolysis for Stroke with Unknown Time of Onset. **N Engl J Med.** 2018, August 16; 379(7): 611-622.

PLANTAR FASCIITIS PREVALENCE AND TREATMENT

Plantar fasciitis (PF) is associated with heel pain, poor quality of life and disability. This study was designed to better understand the epidemiology of PF and to describe common treatments.

Data were obtained from the 2013 National Health and Wellness Survey, a self-administered, internet-based questionnaire completed by 75,000 subjects. Within the questionnaire, the participants were queried concerning diagnoses for pain, which included PF. All were then asked about interventions for pain, including medications, as well as demographics, pain characteristics and other health status characteristics.

Of the adults queried, 1.1% reported a diagnosis of PF in the past year. Of those with PF, pain was reported as severe in 25.93%, moderate in 45.5% and mild in 20.6%. Most reported pain every day. Reports of PF were 2.5 times more prevalent in woman than in men, with the highest prevalence among those 45 to 64 years of age.

Those with a body mass index of 30 kg/mg or more were five times more likely to have PF than were those with a body mass index of less than 25 kg/ mg. One third of the patients reported having been diagnosed at least five years previously. Approximate 70% used over-the-counter analgesics for pain management, with anti-inflammatory medications used by 50% and acetaminophen by 27%.

Conclusion: This large study suggests that plantar fasciitis has a prevalence of 1.1% in the general population, with the highest prevalence occurring among those 45 to 64 years of age.

Nahin, R., et al. Prevalence and Pharmaceutical Treatment of Plantar Fasciitis in United States Adults. **J Pain.** 2018, August; 19 (8): 858-896.

SERUM GFAP AND UCH-L1 PREDICT THE ABSENCE OF TRAUMATIC INTRACRANIAL INJURIES

Prior studies have shown the potential for blood-based brain injury biomarkers to predict the absence of intracranial injury after traumatic brain injury (TBI). No biomarkers are approved by the USFDA for clinical use. This study assessed the ability of a biomarker test combining two proteins, ubiquitin C-terminal hydrolase-L1 (UCH-L1) and glial fibrillary acidic protein (GFAP), to predict CT-detected traumatic intracranial injuries within 12 hours of injury.

This 22-site, international study included patients 18 years of age or older presenting to the emergency department with a suspected TBI. Venous blood was taken, with samples analyzed for UCH-L1 and GFAP. These results were combined into a single test result, with the test considered valid if it satisfied the "Boolean criteria" as either positive or negative. A head CT scan was completed for each individual, with these results compared with those of the serum analysis. The primary outcome variable was the negative predicted value and sensitivity of the test for intracranial injury visible on CT.

Data from 1,959 patients were reviewed. Of these, 125 (six percent) had CT detected intracranial hemorrhages, with eight requiring neurosurgical intervention. In three of the 1,959 patients, the CT scan was positive when the serum test was negative. For detection of intracranial injury, the test had a sensitivity of 0.976 and a negative predictive value of 0.996.

Conclusion: This study of patients with a recent traumatic brain injury demonstrates the high sensitivity and negative predictive value of the combination of serum levels of UCH-L1 and GFAP testing, suggesting a clinical role for ruling out the need for CT scan.

Bazarian, J., et al. Serum GFAP and UCH-L1 for Prediction of Absence of Intracranial Injuries on Head CT (ALERET-TBI): A Multicenter, Observational Study. **Lancet Neurol.** 2018, July 24; 17: 782-789.

TRANSCRANIAL DIRECT CURRENT STIMULATION FOR POSTSTROKE APHASIA

As several pilot studies have indicated a potential role of transcranial direct current stimulation (tDCS) for the treatment of aphasia, this study was designed to better understand the utility of this intervention in patients with stroke.

Eligible participants were between the ages of 25 and 80 years, all with a single event ischemic stroke resulting in aphasia, as confirmed using the Western Aphasia Battery- Revised (WAB-R). The subjects were randomized to receive either active tDCS or sham tDCS, coupledwith

computerized behavioral treatment of anomia. Sessions were 45 minutes each, totaling 15 sessions over three weeks. At one week post- treatment, the subjects were tested for the number of correctly named common objects.

At one week follow-up the mean change in scores on the naming task were 13.9 in the active group and 8.2 in the sham group, reflecting a 70% increase in correct naming in the active, as compared with the sham groups. No adverse events were associated with the active treatment.

Conclusion: This study of patients with post-stroke aphasia found that transcranial direct current stimulation can improve aphasia.

Fridriksson, J., et al. Transcranial Direct Current Stimulation versus Sham Stimulation to Treat Aphasia after Stroke: A Randomized, Clinical Trial. **JAMA Neurol.** Published online. August 20, 2018. doi:10.1001/jamaneurol.2018.2287

ACHILLES TENDON ELONGATION AFTER REPAIR

The Achilles tendon, while the strongest tendon in the human body, is susceptible to complete rupture, occurring most frequently in men 30 to 50 years of age. While the treatment for these ruptures can involve surgical or nonsurgical repair, a consensus has not been reached regarding the optimal intervention. For both interventions the length of the tendon may elongate, with this occurring within 6-12 weeks after surgery. This study was designed to better understand this phenomenon.

Subjects were 75 patients with acute tendon rupture, all presenting for surgical repair. During that procedure, metal beads were implanted on either side of the rupture. After surgery, an orthosis was used for the first six weeks, with three heel wedges placed within the orthosis, with one wedge removed each week to allow for increased dorsiflexion. The participants were randomized to one of three separate rehabilitation regimens, including late weightbearing with immobilization (LWB + IMMOB), late weightbearing with mobilization (LWB + MOB) or early weightbearing with mobilization (EWB + MOB), which involved partial weightbearing from day one and full weightbearing from week five. The primary outcome variable was tissue elongation at rest.

Elongation increased from six to 12 weeks ($p<0.01$) and from 12 to 26 weeks ($p<0$ .001), but not from 26 to 52 weeks. There was no group difference in the amount of elongation that occurred. For tendon cross-sectional area, no interaction or group effect was found, but a significant effect of time was noted ($p<0.0001$).

Conclusion: This study of patients undergoing surgical repair of a ruptured Achilles tendon found that elongation occurs over the first six months, without being influenced by a patient's weightbearing or mobilization protocol.

Eliasson, P., et al. The Ruptured Achilles Tendon Elongates for Six Months after Surgical Repair, Regardless of Early or Late Weightbearing in Combination with Ankle Mobilization. **Am J Sport Med.** 2018, August; 46(10): 2492-2502.

CAFFEINE CYP1A2 GENOTYPE AND ENDURANCE PERFORMANCE

Over 95% of caffeine is metabolized by the CYP1A2 enzyme which is encoded by the CYP1A2 gene. In addition, the 163A>C single nucleotide polymorphism, has been shown to alter the CYP1A2 enzyme inducibility and activity. This study explored the relationship between variations in CYP1A2 genotype and the ergogenic effects of caffeine.

This randomized, double-blinded, placebo-controlled study recruited 101 competitive athletes to complete a 10-km cycling time trial. At week one, saliva samples were collected to determine fast caffeine metabolizers (AA genotype) and slow caffeine metabolizers (AC or CC genotype). During weeks two through four, the athletes were randomly assigned to ingest caffeine at a low dose (2 $mgkg^{-1}$) a moderate dose (4 $mgkg^{-1}$) or a placebo.

The genotypes of the participants were, 49% AA, 43 % AC and 8% CC. For the AA genotype, cycling time improved by 4.8% at a caffeine dose of 2 $mgkg^{-1}$ ($p=0.0005$), and by 6.8% at 4 $mgkg^{-1}$ ($p<.0001$). In contrast, among those with the CC genotype, 4 $mgkg^{-1}$ of caffeine worsened cycling time by 13.7% ($p=0.04$), with no change seen with 2 $mgkg^{-1}$ or placebo. No significant effects were observed among those with the AC genotype at any caffeine load.

Conclusion: This study of competitive athletes found that the ergogenic effect of caffeine is greatly influenced by the 163A>C single nucleotide polymorphism, with the greatest positive ergogenic effect seen among those with the AA genotype.

Guest, N., et al. Caffeine, CYP1A2 Genotype and Endurance Performance in Athletes. **Med Sci Sports Exerc.** 2018, August; 50(8): 1570-1578.

CONDOLIASE FOR LUMBAR DISC HERNIATIONS

Condoliase is a mucopolysaccharidase, with a high specificity for chondroitin sulfate and hyaluronic acid of the nucleus pulposus. This phase three, randomized, clinical trial was designed to verify the efficacy and safety of condoliase for the treatment of lumbar disc herniation (LDH).

Subjects were 163 patients, ranging in age from 20 to 70 years, each with symptomatic LDH. The subjects were randomized to receive either 1 mL of condoliase or a placebo, delivered under fluoroscopy into the nucleus pulposus, and then followed through week 52. The primary endpoint was the reduction in patient-assessed leg pain at week 13, using a 100 mm visual analogue scale (VAS).

Secondary endpoints included the "responder rate" (defined as at least 50% improvement in worst leg pain), and changes at week 52 on the VAS, the Oswestry Disability Index (ODI), the 36-Point Health Survey Form, neurologic exam results, volume of disc herniation, disc height and the need for lumbar surgery.

Significant reductions in VAS scores were noted in both groups, with mean improvements of 49.5mm after condoliase and 34.3mm after placebo ($p=0.001$). The responder rate was higher in the condoliase group at

weeks 13 and 52 (p=0.008 and p=0.002, respectively). Also, at week 52, the condoliase group had superior results in the change in disc height and volume, hypesthesia, straight leg test results and the physical component scores on the SF -36.

Conclusion: This study of patients with symptomatic lumbar disc herniation found that chemonucleolytic treatment with condoliase may improve pain and function.

Chiba, K., et al. Condoliase for the Treatment of Lumbar Disc Herniation: A Randomized, Controlled Trial. **Spine.** 2018 Aug 1; 43(15): 869-876.

MAGNETIC RESONANCE IMAGING AFTER HYALURONIC ACID INJECTION

Hip osteoarthritis (OA) leads to approximately 200,000 annual total hip replacements in the United States. As magnetic resonance imaging (MRI) is sensitive to early, subtle tissue abnormalities, this study used MRI to assess the response of hip OA to hyaluronic acid (HA) injections, using the hip MRI inflammatory scoring system (HIMRISS).

Subjects were 60 adults with symptomatic hip OA, with an inadequate response to NSAIDs or oral analgesics, each of whom had undergone a pelvic MRI before a HA hip injection. Pain, stiffness, and function were assessed with the Western Ontario and McMaster (WOMAC) questionnaire with global health assessed using a Visual Analogic Scale (VAS) at baseline and at three months post-HA injection. Inflammation was assessed with the Hip MRI Inflammatory Scoring System (HIMRISS), before and after the injection. A positive response to the injections was defined as an improvement of WOMAC pain and/ or WOMAC function scores by more than 50% (WOMAC50%).

At baseline, WOMAC function scores were found to be significantly related to HIMRISS synovitis scores (p= 0.03). At three months, 45.5% of the patients achieved a WOMAC50%. No baseline WOMAC values or clinical parameters were associated with a WOMAC 50% response at three months. A multivariate analysis revealed that patients who had low HIMRISS-bone marrow lesion femoral scores and low HIMRISS total scores were more likely to achieve a WOMAC50% response to HA (p=0.02 and p=0.016, respectively).

Conclusion: This study suggests that inflammation, as measured by magnetic resonance imaging, may be useful in predicting the response to hyaluronic acid injection in patients with symptomatic hip osteoarthritis.

Deseyne, N., et al. Hip Inflammation MRI Scoring System (HIMRISS) to Predict Response to Hyaluronic Acid Injection in Hip Osteoarthritis. **Joint Bone Spine.** 2018, Jul; 85 (4): 475-480.

MESENCHYMAL STEM CELL REPAIR OF KNEE CHONDRAL LESIONS

As mesenchymal stem cells have the capacity to differentiate into a variety of cells, many have explored the use of those cells for the treatment of chondral defects. This study used such cells to develop a three-dimensional, tissue-engineered construct (TEC), containing undifferentiated, synovial -derived mesenchymal cells, surrounded by extracellular matrices synthesized by the cells.

Subjects were five patients, 20 to 60 years of age with isolated, full-thickness cartilage defects of the knee. After an arthroscopic biopsy, a volume of TEC was created, and later implanted onto the defect site. Partial weight bearing was allowed at six weeks, and full weight bearing at eight weeks. Assessments occurred on the date of surgery, on postoperative day one, and then at weeks one, two, four, six, 12, 24 and 48. The participants were followed with MRI for up to two years postoperatively. The primary outcome was the safety of the procedure.

No serious adverse events were noted within the first two years. At two years, the defect filling rate reached 100% coverage, with good integration to adjacent cartilage in all cases. All outcomes scores, including pain and function scores, were significantly improved and remained high at 24 weeks.

Conclusion: This study of adults with knee chondral defects found that, by using a new, scaffold-free, tissue-engineered mesenchymal stem cell repair, patients could have complete defect repair combined with significant improvement in function and symptoms.

Shimomura, K., et al. First In-Human Pilot Study of Implantation of a Scaffold-Free Tissue-Engineered Construct Generated from Autologous Synovial Mesenchymal Stem Cells for Repair of Knee Chondral Lesions. **Am J Sports Med**. 2018, August; 46 (10): 2384-2393.

OVERUSE RUNNING INJURIES

Among the over 20 million regular runners in the United States, 65% report running injuries each year. This study investigated the factors associated with overuse injuries.

This prospective, longitudinal trial, The Runners and Injury Longitudinal Study (TRAILS), involved 300, injury free runners, 18 to 60 years of age. All reported running a minimum of five miles per week and were free of injury for the prior six months. Questionnaires were administered at baseline and at six and 12 months' follow-up. The patients were contacted every two weeks for a period of two years to inquire about injuries. Overuse injuries were graded as "maintaining full activity despite symptoms" (grade I), "reducing weekly mileage" (grade II) or "interrupted all training for at least two weeks" (grade III).

Of the 290 participants, 66% sustained at least one overuse running injury, including 73% of the women and 62% of the men. Most of the initial injuries occurred during the first year, with approximately half characterized as grade I. A univariate analysis revealed that

factors at baseline which were significantly associated with an increased chance of injury were lower mental health- related quality of life, more negative emotions endorsed on the Positive and Negative Affect Scale, female gender and greater knee stiffness. A multivariable analysis found only knee stiffness to be predictive of injury (odds ratio 1.18).

Conclusion: This prospective study of adult runners found that overuse injuries are greater among women and among those with greater knee stiffness.

Messier, S., et al. A Two-Year, Prospective, Cohort Study of Overuse Running Injuries: The Runners and Injury Longitudinal Study (TRAILS). **Am J Sport Med.** 2018, July; 46 (9):2211-2221.

POSTOPERATIVE BLOOD GLUCOSE AND INFECTION AFTER JOINT ARTHROPLASTY

Hyperglycemia, independent of diabetes, is a known risk factor for postoperative complications in orthopedic procedures. However, the influence of perioperative hyperglycemia on periprosthetic joint infections is not yet clear. This study was designed to better clarify this relationship.

This single-center, retrospective, case-controlled trial included 24,857, elective, primary total joint arthroplasties performed over 14 years. Post-operative day one blood glucose levels were obtained before breakfast and compared with outcomes for a minimum of one year. Demographic, medical and surgical variables were collected during hospitalization. All participants received standardized perioperative management for infection prophylaxis. Intravenous antibodies were given within one hour before the incision, and for 24 hours postoperatively.

The periprosthetic joint infection rate of the entire cohort was 1.59%. A significant and linear increase in the rate of periprosthetic joint infections was noted beginning at glucose levels of 115 mg/dL (p=0.028). Those with blood glucose levels of 280 mg/ dL had 2.05 greater odds of developing periprosthetic joint infection, as compared to those with a blood glucose level of 100 mg/dL.

Conclusion: This study found that postoperative hyperglycemia, with blood sugars of above 115, was associated with an increased risk of periprosthetic joint infection.

Kheir, M., et al. Postoperative Blood Glucose Levels Predict Infection after Total Joint Arthroplasty. **J Bone Joint Surg Am**. 2018, August; 100 (16):1423-1431.

RISK FACTORS FOR HAMSTRING INJURY IN PROFESSIONAL SOCCER

In elite soccer play, hamstring injuries are the most common noncontact injury. As the evidence supporting the use of stretching exercises for the prevention of these injuries is limited, this study examined the relationship between hamstring injuries and the flexibility of the hamstring and ankle.

Over two consecutive soccer seasons, players in all 18 teams in the Qatar Stars league were assessed for injuries. Data collected also included age, playing season, team, leg dominance, playing position, ethnicity, body mass index, as well as ankle and knee range of motion. Hamstring injury was defined as acute pain in the posterior thigh, occurring during training or match play, and resulting in an immediate cessation of participation.

Of the 438 players completing the study, 78 sustained an index hamstring injury. Goalkeepers were significantly less likely to sustain a hamstring injury than were other players. In addition, injured players were, on average, 18 months older than the uninjured. A multivariate regression analysis revealed that age (p=0.002), player position (p=0.02), passive knee extension test results (p=0.008) and dorsiflexion lunge test results (p=0.02) were significantly related to hamstring injury.

Conclusion: This prospective study of professional soccer players found that modifiable factors related to an increased risk of hamstring injury are decreased knee extension and ankle dorsiflexion passive range of motion.

van Dyk, N., et al. Hamstring and Ankle Flexibility Deficits are Weak Risk Factors for Hamstring Injury in Professional Soccer Players: A Prospective, Cohort Study of 438 Players, Including 78 Injuries. **Am J Sport Med.** 2018, July; 46 (9): 2203-2210.

VERTEBROPLASTY FOR VERTEBRAL FRACTURES

Percutaneous vertebroplasty is widely used to treat osteoporotic vertebral compression fractures. Prior research has produced conflicting data concerning the utility of vertebroplasty for reducing pain, disability, and improving quality of life. This study was designed to help clarify the efficacy of this procedure.

This randomized, double-blind trial included patients at least 50 years of age with one to three osteoporotic compression fractures. The subjects were randomized to receive polymethylmethacrylate cement injections or to undergo a sham procedure with periosteal needle placement, but no cement injection. The primary outcome measure was a ten-point visual analogue scale (VAS) for pain. Secondary outcome measures included the Quality of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO) and the Roland-Morris Disability Questionnaire (RMDQ). Assessments were made at one day, one week, and one, three, six and 12 months after the procedure.

Both the vertebroplasty (n=90) and sham (n=86) groups showed a significant reduction in VAS scores at all times, with no significant difference between the groups at any follow-up. Statistically significant pain reduction began one day post-procedure in both groups. Similar patterns were found for QUALEFFO and RMDQ scores. A

post hoc analysis did reveal more patients in the sham group with VAS scores of above five after 12 months.

Conclusion: This study of patients with painful osteoporotic vertebral fractures found no significant difference in pain reduction between groups treated with vertebroplasty and those treated with a sham procedure.

Firanescu, C., et al. Vertebroplasty versus Sham Procedure for Painful, Acute, Osteoporotic, Vertebral, Compression Fractures (VERTOS IV): Randomized, Sham Controlled, Clinical Trial. **BMJ.** 2018: 361:k1551.

SURGERY VERSUS BRACE FOR PATELLAR DISLOCATION

Lateral patellar dislocation (LPD) is estimated to occur with an incidence of up to 1.2 per 1,000 children nine to 15 years of age. This study compared the outcomes of those patients with LPD treated with surgical repair with those of children treated with bracing.

This prospective study recruited patients between nine and 14 years of age with an acute, primary LPD. The subjects were randomized within two weeks of the injury, and after diagnostic arthroscopic surgery. Those randomized to a knee brace group received a lateral stabilizing soft knee brace, applied 24 hours per day for one month, combined with physical therapy. The operative group underwent arthroscopic-assisted repair of the medial patellofemoral ligament. The main outcome variable was a redislocation at two years.

At two-year follow-up, the redislocation rates were 22% in the surgical group and 43% in the bracing group. During that time, six patients from the bracing group were surgically stabilized. Within the two years, 14% suffered a dislocation of the contralateral knee. Knee Injury and Osteoarthritis Outcome Score for Children's-Sports Play and Quality of Life Subscale scores were better in the surgical group than in the bracing group. Of those without redislocation, objective and subjective knee function was comparable between groups.

Conclusion: This study of children with a primary patellar dislocation found that surgical repair resulted in a reduced redislocation rate as compared to conservative treatment with bracing and PT.

Askenberger, M., et al. Operative Repair of Medial Patellofemoral Ligament Injury versus Knee Brace in Children with an Acute, First-Time, Traumatic Patellar Dislocation: A Randomized, Controlled Trial. **Am J Sports Med.** 2018, August: 46 (10):2328-2340.

SPINE MANIPULATION FOR LOW BACK PAIN IN ADOLESCENTS

Low back pain (LBP) is now the leading cause of disability worldwide. While many studies have addressed LBP in adults, studies of children and adults are far less abundant. This study was designed to better understand the effectiveness of spinal manipulation plus exercise compared with exercise alone in an adolescent population.

This two-site, parallel group, randomized controlled trial included patients 12-17 years of age with subacute and recurrent, or chronic nonspecific LBP. Chronic LBP was defined as 12 or more weeks of pain. Both groups received exercise training with no more than two sessions per week for 12 weeks. Those in the combined group attended 8-16 chiropractic visits, up to 20 minutes per session, no more than two times per week. The primary outcome measure was a self-reported typical level of LBP severity over the past week, as measured by a numerical rating scale. These were collected at baseline and at four, eight, 12, 26 and 52 weeks after enrollment.

Secondary outcome measures included patient rated disability, quality of life, improvement in symptoms, frequency of medication use and patient satisfaction with care. Compared with the exercise group, ratings of LBP were better in the combined group over the first year ($p<0.007$). For reduction in pain severity, the combined group had better adjusted mean scores than did the exercise group at 12 weeks ($p=0.083$), 26 weeks ($p<0.001$), and 52 weeks ($p=0.009$). In the secondary analyses, quality of life and medication use did not significantly differ between groups over the first year.

Conclusion: This study of adolescents with chronic LBP found that combining exercise with spinal manipulation was more effective than exercise alone for reducing pain.

Evans, R., et al. Spinal Manipulation and Exercise for Low Back Pain in Adolescents: A Randomized Trial. **Pain.** 2018, July: 159 (7):1297-1307.

PREOPERATIVE OPIOID USE AND READMISSION AFTER JOINT REPLACEMENT

In previous studies, preoperative opioid use has been associated with a worse clinical outcome. This study was designed to better understand the association between preoperative opioid use and the 30-day readmission rates among patients undergoing joint replacement surgeries.

This retrospective cohort study used data from the Truven Health MarketScan Commercial Claims and Encounters (commercial insurance) and the Medicare Supplemental and Coordination of Benefit (Medicare plus commercial supplemental insurance) databases. Patients were included who underwent total knee arthroplasty (TKA) or total hip arthroplasty (THA). Data were also obtained for opioid use in the six months before surgery. Opioid use was stratified as, no preoperative use (opioid naive), 1-30 days of use, 30-60 days of use, and more than 60 days of use (chronic users). The primary outcome measure was the 30-day readmission rate after surgery. Among the 324,154 patients, chronic opioid use was found in 15.6% of the TKA and 18.4% of the THA patients. For both TKA and

THA patients, the 30-day readmission rates were greater in the chronic opioid users as compared to the opioid naïve patients ($p<0.001$ for both comparisons). In a multivariate logistic regression analysis, compared to 0-60 day users, the one- year adjusted risk for a revision surgery among chronic users was 1.70 for the TKA and 2.26 for THA patients.

Conclusion: This study identifies preoperative opioid use as a risk factor for hospital readmission after total hip or total knee arthroplasty.

Weick, J., et al. Preoperative Opioid Use Is Associated with Higher Readmission and Revision Rates in Total Knee and Total Hip Arthroplasty. **J Bone Joint Surg.** 2018, July 18; 100-A (14): 1171-1176.

OBESITY AND SURGICAL SITE INFECTION

Obesity is recognized as a burden on healthcare systems. Obese individuals are more likely to develop osteoarthritis (OA) requiring a total knee arthroplasty (TKA). TKA is an invasive surgery with many associated complications, including surgical site infection (SSI). This study explored the association between body mass index (BMI) and surgical site infection.

This study retrospectively evaluated 839 patients who underwent a primary TKA. The charts were reviewed for BMI at the time of surgery and SSI during the year after surgery. Superficial SSI (SSSI) was classified as any infection that did not require re-hospitalization and which occurred during the first 30 days post-operatively. Deep SSI (DSSI) was classified as any infection that required a re-admission within one year post-operatively.

Compared with all other weight groups, the obese class III group (>40kg/m^2) had a 4.20 times greater odds of SSSI ($p=0.009$) and a 6.97 times greater odds of DSSI ($p=0.003$).

Conclusion: This study of patients undergoing total knee arthroplasty revealed that compared with those with a lesser BMI, those in obese class III had a higher incidence of surgical site infections.

Wilson, C., et al. Surgical Site Infection in Overweight and Obese Total Knee Arthroplasty Patients. **J Ortho.** 2018, June; 15(2): 328-332.

INTRAMUSCULAR STEROID INJECTIONS FOR HIP OSTEOARTHRITIS

A systemic effect of glucocorticoid on joint pain has been demonstrated in patients with subacromial impingement of the shoulder. This study was designed to determine whether intra-muscular rather than intra-articular glucocorticoid injections can affect hip pain among patients with osteoarthritis (OA) of the hip.

Subjects were patients over 40 years of age with symptomatic OA of the hip for at least six months, with hip pain severity of at least three on a 10-point scale. The patients were randomized to receive either 40 mg of triamcinolone acetate or a similar volume (1 mL) of normal saline, injected at the lateral upper quadrant of the gluteal musculature. Primary outcome variables were the severity of hip pain at two weeks, as measured by an 11-point numerical rating scale, at rest and during walking, as well as scores on the Western Ontario and McMaster University Osteoarthritis Index (WOMAC) Pain Subscale.

At two weeks, compared with the placebo group, the glucocorticoid group had a significant reduction in hip pain at rest, but not during walking. At four-, six- and 12-week follow-ups, the glucocorticoid group had significant hip pain reductions at rest and during walking. Other differences favoring the glucocorticoid group including WOMAC Pain, Function, Stiffness subscales and Total scale. Adverse events were reported by 13 patients in the placebo group and 19 in the glucocorticoid group.

Conclusion: This randomized, controlled trial found that an intramuscular glucocorticoid injection can reduce pain and improve function for up to 12 weeks.

Dorleijn, D., et al. Intramuscular Glucocorticoid Injection versus Placebo Injection in Hip Osteoarthritis: A 12-Week, Blinded, Randomized, Controlled Trial. **Ann Rheum Dis**. 2018, June; 77(6): 875 -882.

ASSOCIATION BETWEEN BMI AND LOW BACK PAIN

Low back pain (LBP) and obesity are two of the most prevalent medical conditions in the United States. Each are major drivers of increased health care expenditures. This study explored the prevalence, severity and frequency of LBP and its association with body mass index (BMI).

This study included 4,796 patients from the Osteoarthritis Initiative, a prospective study initially designed to review osteoarthritis of the knee. BMI was classified according to the World Health Organization's definition, with prevalence, severity and frequency of low back pain also assessed.

Compared with patients in the normal and underweight categories, those who were overweight and obese had an increased prevalence of LBP ($p<0.05$ for both), as did those who were severely and morbidly obese ($p<0.01$ for both). An adjusted analysis indicated that variables significantly related to an increased prevalence of LBP were a BMI of greater than 25 kg/m^2 ($p=0.021$), depression ($p=0.048$), smoking ($p=0.002$), OA of the hip ($p=0.025$) and OA of the spine ($p<0.001$).

Conclusion: This study suggests that a BMI of over 25kg/m^2 is associated with an increased prevalence of low back pain.

Su, C., et al. The Association between Body Mass Index and the Prevalence, Severity and Frequency of Low Back Pain. **Spine.** 2018, June. 43(12): 848-852.

KNEE REPLACEMENT

INFECTION AND BODY MASS INDEX

Obesity and overweight are worldwide health epidemics, with obesity associated with earlier total joint arthroplasties and higher revision rates. This retrospective study of patients who received a total knee arthroplasty (TKA) was designed to better understand the association between surgical site infection (SSI) and obesity.

Subjects were 839 patients who had undergone routine, primary TKA between April of 2007 and March of 2008. The subjects were divided by body mass index (BMI) according to the World Health Organization's (WHOs) classifications as normal, overweight, obese class I, obese class II and obese class III. The rate of infection was assessed for each of these weight categories.

Of the 839 patients, the mean BMI was 31.9kg/m^2, with 9.8% in the WHO normal BMI range, 31.7% overweight, 30.9% obese class I, 19.0% class II and 8.7% obese class III. Among the cohort, superficial SSI occurred in 2.6%, and deep SSI in 1.5%. When subjects were grouped as either obese or not obese, no significant difference was seen between the groups. However, the risks of superficial and deep SSI were 4.2 and 6.97 times greater respectively in the obese class III group compared with the other weight groups (p=0.009 and p=0.003, respectively).

Conclusion: This study of patients undergoing total knee arthroplasty found that a greater risk of superficial and deep surgical site infections was higher only among those with a body mass index of 40kg/m^2 or greater.

Wilson, C., et al. Surgical Site Infection in Overweight and Obese Total Knee Arthroplasty Patients. **J Orthop.** 2018, June; 15(2): 328-333.

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IN REVIEW

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Expanding the frontier of medicine in research, teaching, and patient care