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SELF-REPORTED HEALTH AMONG OLDER CHINESE VERSUS AMERICANS

Many factors have been shown to influence self-rated health in the older population. However, most studies have been conducted in one country. This study compared the self-rated health of older adults in China with those of their American counterparts.

Data were retrieved from the 2014 Health and Retirement Study (HRS) and the China Health and Retirement Longitudinal Study (CHARLS), conducted from 2014 to 2015. Data were analyzed for 8,905 older adults in the USA and 4,442 in China. Information was obtained concerning self-rated health, sociodemographics and family structure, functional limitations, cognition, mental health and health-related behaviors. The responses were reviewed by age category, including those 65 to 74 years, 75 to 84 years and eighty-five years of age and older.

Older Chinese subjects reported more instrumental activities of daily living limitations relative to older Americans; however, the difference in ADLs limitations was small. Older Chinese participants further reported a lower proportion of chronic conditions than did older Americans. In addition, older Chinese had poorer mental health and worse cognition, including self-reported memory and total recall scores than did older Americans. Approximately 78% of older Chinese reported fair or poor health status, while 74% of older Americans reported excellent, very good, or good health status. An ordered logistic regression model revealed that the odds of having better versus poorer health was almost five times greater in American older adults than in those in China (Odds Ratio 4.88).

Conclusion: This nationally representative sample of older populations in China and the United States found that, relative to their American counterparts, Chinese elders were much more likely to report bad health.

Xu, D., et al. A Cross-Sectional Study of Self-Reported Health among Older Adults: A Comparison of China and United States. **BMJ Open.** 2019; 9: e027895.

SOCIAL ISOLATION AND STROKE RISK

Stroke is the second most common cause of death worldwide. This Chinese study assessed the effect of social isolation on the risk of stroke in middle aged and older adults.

Data were obtained from the China Health and Retirement Longitudinal study, which included a representative study of persons 45 years of age or older in China. The data were stratified by region, type of residence, county level of gross domestic product and residency situation. All subjects underwent face-to-face interviews and computer aided household interviews with a structured questionnaire. Social isolation was assessed using a five-item scale, with depression assessed using the Center for Epidemiologic Studies Depression Scale-Short Form. A dose response assessment was made between social isolation scores and stroke incidence.

At the end of 2015, 1.93% of the cohort reported a stroke. A regression analysis revealed that persons living in social isolation were at a 64% higher risk of stroke than those who were not. When controlling for depression, those in social isolation had more than a doubled risk of stroke (OR 2.39) compared to those without social isolation.

Conclusion: This population-based sample of Chinese adults 45 years of age or older found that those living in social isolation are at more than twice the risk of stroke than those not living in social isolation.

Zhou, Z., et al. The Association of Social Isolation with the Risk of Stroke among Middle-Aged and Older

Adults in China. **Am J Epidemiol.** 2019, August; 188 (8): 1456-1465.

OSTEOARTHRITIS AND THE RISK OF CARDIOVASCULAR DISEASE

Nonsteroidal anti-inflammatory drugs (NSAIDs) are associated with cardiovascular side effects. As NSAIDs are commonly used in the treatment of osteoarthritis (OA), this study evaluated the mediating role of NSAID use in the relationship between OA and cardiovascular disease (CVD).

This longitudinal study analyzed a cohort of 720,055 British Columbia adults registered in the national health database from April 1991 to December 2013. Data were available for health information including health-related consultations, hospital admissions, diagnoses and deaths. In addition, community dispensed prescriptions were monitored. A group of non-OA individuals was compared to those with OA. The primary outcome measure was the composite of CVD events, with the secondary outcomes including ischemic heart disease, congestive heart failure and stroke.

Data were analyzed for 7,743 patients with OA, and 23,229 non-OA controls. The mean age of study participants was 64.5 years. At a mean follow-up of 9.7 years, the crude incidence rate of CVD per 1000 person years was 38.07 among patients with OA and 29.05 among non-OA controls. Adjusting for risk factors, the risk of CVD was significantly higher among those with OA as compared to controls (Hazard Ratio 1.23). Among the secondary risk factors, the risk was highest for CHF (Hazard Ratio 1.42). Approximately 41% of the total effect of OA on the increased risk of CVD was mediated through NSAID use. For the secondary outcomes, NSAID use mediated 23%, 56%, and 64% of the risk for congestive heart disease, ischemic heart disease, and stroke, respectively.

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Conclusion: This study demonstrates that patients with osteoarthritis have an increased risk of cardiovascular disease, with much of this risk related to the use of nonsteroidal anti-inflammatory drugs.

Atiquzzaman, M et al. Role of Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) in the Association between Osteoarthritis and Cardiovascular Disease: A Longitudinal Study. *Arthritis Rheumatol.* DOI: 10.1002/ART.41027

ELECTRICAL STIMULATION FOLLOWING PERIPHERAL NERVE INJURY

Previous studies of nerve injuries have shown that electrical stimulation can promote axon elongation across a surgical repair site. This animal study assessed the efficacy of repeated applications of a brief electrical stimulation on the recovery of an injured peripheral nerve.

In a well-established peripheral nerve injury model, a transection and surgical repair of a murine sciatic nerve was completed. Electrodes and recording hardware were implanted near the repair site. In the repeat condition (R), electrical stimulation was applied for one hour at 20 Hz on the day of the surgery and every third day for two weeks. In the controls, the injured mice were either untreated (U) or treated with a single ES (S). Stimulus evoked EMG data were then collected for up to 12 weeks post-injury. The animals were then euthanized for histologic evaluation of the nerves.

The amplitudes of the muscle responses increased progressively over time, with the rate of progression increased significantly in animals treated once with ES. The H-reflex recovered in all groups but reached more than twice the baseline level in the R group. In the anatomical study, both excitatory and inhibitory synaptic contacts in the injured cell bodies were sustained in the R group, but not in the others.

Conclusion: This animal study of a peripheral nerve injury suggests that repeated electrical stimulation does not enhance the rate of restoration of functional muscle denervation, and, in fact, may result in a retention of exaggerated reflexes.

Park, S., et al. Effects of Repeated 20 Hz Electrical Stimulation on Functional Recovery following Peripheral Nerve Injury. *Neurorehab*

Neural Repair. 2019, September; 39 (9): 775-784.

CORTICOSTEROID INJECTION FOR PLANTAR HEEL PAIN

Corticosteroid injections are often used to treat plantar heel pain. This literature review was designed to better understand the data surrounding this intervention.

A literature review was completed of randomized trials which included a corticosteroid injection for plantar heel pain and at least one outcome measure of pain. From this review, 47 studies were chosen for qualitative analysis and 39 for meta-analysis.

The combined sample size for the final analysis was 2,989. The outcome measures were determined for a time-points categorized as short-term (zero to six weeks), medium-term (seven to 12 weeks) and long-term (13 to 52 weeks). For reducing pain in the short-term, corticosteroid injections were more effective than autologous blood and foot orthoses. In the long-term, corticosteroid injections were less effective than dry needling or platelet rich plasma injection. For physical function, corticosteroid injections were more effective than physical therapy in improving function.

Conclusion: This literature review and meta-analysis found that corticosteroid injections were more effective for short-term pain relief than autologous blood injections or foot orthoses, but in the longer term, less effective than dry needling and platelet rich plasma.

Whittaker, G., et al. Corticosteroid Injection for Plantar Heel Pain: A Systematic Review and Meta-Analysis. *BMC Musculoskeletal Disord*, 2019; 20: 378.

IONTOPHORESIS FOR LATERAL EPICONDYLITIS

Lateral epicondylitis is a prevalent disorder, thought to be caused by repetitive strain of the tendon of the extensor carpi radialis brevis. This study evaluated the effectiveness of iontophoresis, as compared with the galvanic current therapeutic approach.

This double-blind, randomized, clinical trial included 24 adult patients clinically diagnosed with lateral epicondylitis, all of whom had not received any treatment for the prior four weeks. Baseline data included a pain assessment, using a 10-point

visual analog scale, muscle strength and hand grip strength, as well as a functional assessment, using the patient rated Tennis Elbow Evaluation Scale (TEES). Intervention occurred at 5 mA for 15 minutes, three times a week for four weeks. The prescription solution included 3 mL of 4 mg per mL of dexamethasone and four percent lidocaine gel applied at the negatively charged electrode. The positively charged electrode received the base gel solution. The galvanic current group received the same protocol, with a base gel solution used on both electrodes. Changes in pain scores were compared between the groups.

Significant pain reduction at rest was noted in both groups. At the end of the study, the iontophoresis group showed significantly lower pain levels at rest than did the galvanic current group ($p=0.002$). Pain on exertion decreased more in the iontophoresis group than in the galvanic current group ($p=0.000$). No significant difference in muscle strength was noted between groups.

Conclusion: This study of patients with lateral epicondylitis found that iontophoresis was superior to galvanic current stimulation for reducing pain, both at rest and with exertion.

Luz, D., et al. Iontophoresis and Lateral Epicondylitis: A Randomized, Double-Blind, Clinical Trial. *J Shoulder Elbow Surg.* 2019, September; 28 (9): 1743-1749.

TENS FOR ANKLE STRETCH IN THE ICU

Patients in the intensive care unit (ICU) are at risk for a number of complications, including joint contracture. As previous studies have shown that transcutaneous electrical nerve stimulation (TENS) can improve range of motion, spasticity and contracture in joints, this study investigated the effects of adding TENS to passive stretch.

This double-blind, controlled, clinical trial included patients with at least one week in the ICU. All were assessed for passive ankle range of motion, including plantarflexion and dorsiflexion. The subjects were randomized to receive standard care (S) or standard care with TENS (S+T). Standard care included stretching in dorsiflexion, applied to the patient's ankle with the knee in full extension, with five, two-minute sessions of stretch and a one-minute rest between. For the S+T group, before

stretching TENS was applied for 30 minutes at a frequency 100 Hz, a duration of 0.2 ms and an intensity of 15 mA. The sessions were completed three times per week for two weeks. A therapist held blind to the treatment group measured range of motion at baseline and at follow-up.

Comparing baseline to final follow-up the range of motion was found to have improved in both groups, with significantly greater improvement noted in the S+T group than in the S group, for both plantarflexion ($p=0.001$) and dorsiflexion ($p=0.001$).

Conclusion: This study of patients in the intensive care unit found that, compared to passive stretching alone, ankle range of motion can be enhanced by preceding passive stretching with TENS unit stimulation.

Shamsi, M., et al. The Effect of Adding TENS to Stretch on Improvement of Ankle Range of Motion in Inactive Patients in Intensive Care Units: A Pilot Trial. *BMC Sports Sci Med Rehab.* 2019; 11: 15.

PERONEAL TENDON SHEATH CORTICOSTEROID INJECTION

The treatment of symptomatic peroneal tendinopathy and tears typically begins with conservative intervention. This study assessed the efficacy of ultrasound-guided peroneal tendon sheath corticosteroid injections for the treatment of chronic tendinopathy or tears.

This retrospective study reviewed consecutive patients who had undergone ultrasound-guided peroneal tendon sheath corticosteroid injections for pain due to peroneal tendinopathy, tears or subluxation between the years 2012 and 2018. During that time, 96 patients received 109 injections. The medical records were reviewed for medical workup surrounding the procedure, treatment outcome, and socioeconomic and demographic data.

Of the 86 patients followed after the injection, 44% reported pain relief lasting only one week, while 36.8% reported greater than 12 weeks of pain relief. The duration of symptoms before the injection was associated with the duration of pain after the injection ($p=0.036$). Twenty-four of 96 (25%) patients went on to have surgery involving their peroneal tendons following injection. None were found to have a tear or tendinopathy compared with

preoperative MRI. One was found to have sural nerve irritation.

Conclusion: This study of patients with chronic peroneal pain found that of those injected, 44% had very short pain relief while 37% reported pain relief greater than three months.

Fran, B et al. Clinical Outcomes and Complications of Peroneal Tendon Sheath Ultrasound-Guided Corticosteroid Injection. *Foot Ankle Int.* 2019; <https://doi.org/10.1177/2F1071100719847629>.

DIRECT CURRENT STIMULATION FOR DEPRESSION

Depression affects many patients with central nervous system disorders. As several randomized, controlled trials have suggested that transcranial direct current stimulation (tDCS) may be an effective adjunct in the treatment of depression, this study further investigated this treatment modality.

Subjects diagnosed with major depressive disorder were randomized to receive escitalopram 20 mg/day, bifrontal tDCS (2 mA, 30min, 22 sessions) or placebo. All patients were assessed by magnetic resonance imaging, with T1-weighted images segmented into gray matter, white matter and cerebral spinal fluid. These findings were used to calculate the volumes of the dorsolateral prefrontal cortex and the anterior cingulate cortex (ACC).

Data were complete for 52 patients, with 15 in the active tDCS group, 16 in the escitalopram group and 21 in the placebo group. Improvements on the Hamilton Depression Scale were 7.2 points in the tDCS group, 10.1 points in the escitalopram group and 5.8 points in the placebo group ($p=0.3$). Larger gray matter volumes in the left dorsal PFC were associated with improvement in depression with tDCS compared to the control ($p=0.04$), with no such association noted for the right PFC or the ACC.

Conclusion: This study demonstrates that the efficacy of transcranial direct current stimulation, applied over the prefrontal cortex in patients with depression, is associated with the volume of the left prefrontal cortex.

Bulubas, L., et al. Antidepressant Effects of tDCS are Associated with Prefrontal Gray Matter Volumes at Baseline: Evidence From the ELECT-

FLUOXETINE AND TRANSCRANIAL MAGNETIC STIMULATION AFTER STROKE

Fluoxetine has been found to enhance motor outcome following ischemic stroke. Repetitive transcranial magnetic stimulation (rTMS) appears to enhance motor performance, by influencing cortical excitability in a relatively focal area. This study explored the effects of these interventions when combined.

Participants were adults with hemiparesis due to ischemic stroke, all sustained within the prior two years. All underwent 18 sessions of sham or active TMS over the M1 area of the unaffected hemisphere. The stimulus was titrated to the lowest level that could invoke a motor evoked potential, and was applied at 1 Hz, 1200 pulses for 20 minutes. The sham stimulation utilized a small current, delivered over the forehead. In addition, the subjects received fluoxetine, 20 mg, or placebo, daily for 90 days. Outcomes measured up to 90 days included motor function changes from day zero to day 90, with secondary outcomes including scores on measured of depression and cognition.

After adjusting for the times since the stroke, improvement on the Jepsen-Taylor hand function test was greater in the combined group than in the placebo group ($p=0.005$) or in the fluoxetine group ($p<0.001$). The fluoxetine group demonstrated less improvement than did the placebo group on motor function scales. The unaffected hemisphere showed a decrease in intracortical inhibition in both the combined and fluoxetine groups, with increased intracortical facilitation seen in the fluoxetine group. The facilitation was negatively correlated with motor function improvement.

Conclusion: This study of patients with chronic ischemic stroke found that combining fluoxetine and repetitive transcranial magnetic stimulation resulted in a better motor function outcome than did fluoxetine alone.

Pinto, C., et al. Combining Fluoxetine and rTMS in Poststroke Motor Recovery: A Placebo Controlled, Double-Blind, Randomized, Phase-II Clinical Trial. **Neurorehab Neural Repair.** 2019, August. 38 (8): 643–655.

TRANSCRANIAL DIRECT CURRENT STIMULATION IN WIDESPREAD PAIN

Fibromyalgia (FM) encompasses systems of central sensitization syndrome. Medications have been limited in their ability to adequately treat many of these patients. As transcranial direct current stimulation (tDCS) has been found to be effective in treating other pain conditions, this study assessed the efficacy of tDCS as a treatment for FM.

This study included 20 adult females, ages 18 to 65 years, all diagnosed with FM. The patients were randomly assigned to an active tDCS (a-tDCS) group or a placebo tDCS (p-tDCS) group. For both groups, the anode electrode was placed over the left dorsolateral prefrontal cortex (DLPFC) and the cathode over the right DLPFC. After training, the a-tDCS was self-delivered at home for 30 minutes per day at 2 mA, with 60 sessions completed over 12 weeks. The primary outcome variable was the change in pain, as measured across the 12 weeks of treatment. Baseline blood samples were collected and after the end of treatment to determine blood derived neurotrophic factor (BDNF) levels.

By the fourth week of treatment, visual analogue scale pain scores (VAS-P) improved by 45.7% in the a-tDCS group and 27.7% in the p-tDCS group ($p=0.01$). At 12 weeks, VAS-P scores were reduced by 62.06% in the a-tDCS group and 24.92% in the p-tDCS group ($p<0.001$). Those with greater BDNF levels at baseline had greater improvement in VAS-P scores with treatment ($p=0.01$).

Conclusion: This study of patients diagnosed with fibromyalgia found that transcranial direct current stimulation, applied over the dorsolateral prefrontal cortex, can significantly improve pain and disability.

Brietzke, A., et al. Large Treatment Effect with Extended, Home-Based Transcranial Direct Current Stimulation over Dorsolateral Prefrontal Cortex and Fibromyalgia: A Proof of Concept, Sham, Randomized, Clinical Study. **J Pain.** 2019. <https://doi.org/10.1016/j.jpain.2019.06.013>

CURCUMIN INHIBITS JOINT CONTRACTURE

Joint contracture is a clinical problem that affects joint function.

Prior studies have shown that phosphatase and tension homolog (PTEN) play a role in fibrosis. Others have found that curcumin has antifibrotic effects in the liver and lung, and that changes in DNA methylation may play an important role in curcumin's multiple pharmacological properties. This study investigated the effects of curcumin on joint contracture.

Joint capsules were collected from patients with joint contracture and from a control group without joint contracture. Capsules were used for the isolation and culture of fibroblasts, with fibroblasts then induced using a transforming growth factor. These samples were then exposed to curcumin for 72 hours. The cells were assessed for cell viability, migration, collagen production and RNA.

Western blot analysis revealed that PTEN expression was lower in the contracture capsule tissues than in normal capsule tissues ($p<0.05$) and decreased in the curcumin group ($p<0.05$). Those treated with curcumin demonstrated a restoration of PTEN expression, downregulated α -SMA expression and suppressed proliferation and migration of myofibroblasts by demethylation and inhibition of PI3K/Akt/mTOR signaling.

Conclusion: This study of joint capsule tissue found that curcumin can upregulate tumor suppression gene PTEN expression and inhibit the proliferation and migration of myofibroblasts.

Zhuang, Z., et al. Curcumin Inhibits Joint Contracture through PTEN Demethylation and Targeting PI3K/Akt/mTOR Pathway in Myofibroblasts from Human Joint Capsule. **Evidence-Based Complementary and Alternative Medicine.** <https://doi.org/10.1155/2019/4301238>.

CEREBROLYSIN IN THE MINIMALLY CONSCIOUS AFTER STROKE

Cerebrolysin, composed of low-molecular-weight peptides and amino acids, has been shown to exert neuroprotective and neurotrophic effects similar to those of endogenous neurotrophic factors. This study assessed the effect of Cerebrolysin for the treatment of patients in a minimally conscious state resulting from a cerebrovascular accident.

This retrospective study included patients with an ischemic and/or

hemorrhagic stroke in a minimally conscious state, as defined by the Coma Recovery Scale-Revised (CRS-R). All subjects received rehabilitation therapy, including physical therapy, occupational therapy and speech therapy, with CRS-R scores assessed at admission and at discharge. Patients who were treated with Cerebrolysin (10ml per day) for at least 20 days were compared to those who did not receive this medication. The primary outcome measure was the change in CRS-R scores.

Subjects were 75 patients with an age range of 23 to 93 years. The changes in CRS-R scores from admission to discharge were 4.2 in the treatment group and 2.3 in the control group. An adjusted analysis revealed that those in the treatment group had significantly better improvement in CRS-R scores than did those in the control group ($p=0.01$). The adjusted subscale analysis demonstrated greater improvement in the treatment group than in the control group in oromotor function ($p=0.003$) and arousal ($p=0.038$), with a trend toward better improvement on the visual function subscale ($p=0.061$).

Conclusion: This retrospective study of patients in a minimally conscious state after a cerebrovascular accident found that treatment with Cerebrolysin was associated with greater recovery.

Kim, A., et al. Effects of Cerebrolysin in Patients with Minimally Conscious State after Stroke: An Observational, Retrospective, Clinical Study. *Front Neurol.* 10: 803. <https://doi.org/10.3389/fneur.2019.00803>.

PERIPHERAL NEUROPATHY WITH THE USE OF ORAL FLUOROQUINOLONES

Fluoroquinolones are commonly used antibiotics to treat various infections of the urinary, respiratory, and gastrointestinal tracts. While peripheral neuropathy is one of the known adverse effects, the incidence has been poorly quantified. This study was designed to further understand the risk of peripheral neuropathy following exposure to fluoroquinolones.

This nested case-control study gathered data from a large primary care population database in the United Kingdom, covering the years 1999-2015. Subjects were adults who were issued at least one prescription of oral fluoroquinolone or amoxicillin-

clavulanate. Those prescribed amoxicillin-clavulanate served as controls.

A total of 1,338,900 adults, without a baseline diagnosis of peripheral neuropathy were prescribed fluoroquinolone (34.3%) or amoxicillin-clavulanate (65.7%). After excluding diabetic patients, 5,357 incident peripheral neuropathy cases were matched to 17,285 controls. The median duration was 10 days for fluoroquinolone exposure and 7 days for amoxicillin-clavulanate exposure. Compared to those without antibiotic exposure, the relative incidence of peripheral neuropathy was significantly increased with oral fluoroquinolones within 30 days of exposure (Incident relative risk (IRR) 1.47) remaining significant up to 180 days post-exposure. No such risk was found with amoxicillin-clavulanate exposure (IRR 1.10). The risk increased by three percent for each additional day of fluoroquinolone exposure, but not with amoxicillin-clavulanate exposure.

Conclusion: This study found that oral fluoroquinolone exposure was associated with an increased risk of peripheral neuropathy, especially among men and patients older than 60 years of age.

Morales, D., et al. Association Between Peripheral Neuropathy and Exposure to Oral Fluoroquinolone or Amoxicillin-Clavulanate Therapy. *JAMA Neurol.* 2019, July; 76 (7):827-833.

ANKLE INJURIES IN COLLEGIATE SOCCER

Previous studies have found that, among National Collegiate Athletic Association (NCAA) soccer players, ankle injuries occur at a rate of 7.5 per 1,000 athletic exposures (AE). This study reviewed 10 years of NCAA data to determine the change in the injury rate and injury characteristics over time.

Data were obtained from the NCAA injury surveillance program. In this system, an athletic injury (AE) is defined as a traumatic event resulting in the absence from at least one practice session or competitive event. Data were reviewed for gender, diagnostic characteristics of the ankle sprain and the year of occurrence.

For the 2004-2005 through the 2013-2014 seasons, ankle injuries occurred at a rate of 1.42 per 1,000 athletic events, with no significant difference in rates noted between time periods. However, the average

number of days missed during the period of 2003-2009 was 11.06, as compared with 5.09 in the 2009-2014 seasons ($p<0.001$). The most common ankle injury was a lateral ligament complex tear, accounting for 65.67% of the injuries. Other injuries were of the tibiofibular ligament in 10.3%, ankle contusions in 10.1% and medial deltoid ligament in 9.77%. Compared to the other ankle injuries, high ankle sprains resulted in a greater portion of athletes missing 30 or more days of participation. Injuries were three times more likely during games than in practice, and when sustained during competition, occurred more often during the second half.

Conclusion: This review of collegiate soccer ankle injuries found that the rate of ankle injuries did not change between the 2004 and 2014 seasons, although the prognosis improved over time.

Gulbrandsen, M., et al. Ten-Year Epidemiology of Ankle Injuries in Men's and Women's Collegiate Soccer Players. *J Athl Train.* 2019; 54 (8).

APPROPRIATE RESISTANCE INTENSITY FOR INFRASPINATUS ACTIVATION

Among the rotator cuff muscles, the infraspinatus is particularly instrumental in the production of primary external rotation torque and dynamic shoulder stability. This study investigated the appropriate resistance intensity for the optimal selective activation of the infraspinatus.

Subjects were 15 healthy males who performed two exercises at three resistance levels, completed in both prone and sitting positions. Resistance was placed at low intensity (10-20%), medium intensity (45-55%) or high-intensity (60-70%). During exercise, surface EMG was used to measure the activity of the infraspinatus and posterior deltoid muscles. The infraspinatus/posterior deltoid activation ratio (AR) was measured, in order to determine the condition that best isolated the infraspinatus.

Significant differences in the AR among resistance intensity conditions were observed during both prone ($p=0.031$) and sitting ($p=0.002$) conditions. The AR was optimized at low intensity during the prone condition (3.75).

Conclusion: This study suggests that low intensity is the appropriate

resistance intensity for the selective activation of the infraspinatus.

Yu, I., et al. Appropriate Resistance Intensity and Effective Exercise for Activation of Infraspinatus. *Int J Sports Med.* 2019; 40(09): 569-575.

PROFESSIONAL SOCCER RETURN TO PLAY AFTER ACHILLES RUPTURE

Previous studies have suggested that 80 percent of the general population can return to sports after an acute Achilles rupture (AAR). This study focused on male, professional soccer players, to better understand the timing and extent of recovery after an AAR.

Using internet-based injury reports, data were obtained for professional, male soccer players from 2008 to 2018 who had sustained an AAR and who underwent a surgical repair. Data were obtained on anthropometrics, playing position, team and league of play. In addition, injury history and time of return to play were retrieved, including data regarding the number of games played before and after the injury.

During the 10 years of the study, 118 AARs were identified. Return to unrestricted practice was realized in 96% of those injured after a mean of 199 days after the injury. One of the players re-ruptured his Achilles during training, with the remaining returning to competition at an average of 274 days post-injury. The number of matches played the first season after return to play was lower, while the number of matches played the second season was similar to the number of matches played before the injury. Of the 71 athletes who played at least two full seasons, eight percent sustained a re-rupture. Of the athletes who returned to play two seasons after AAR, 82% were able to perform at a level comparable to their pre-injury status. Risk factors for not returning to the same level included age over 30 years (Odds Ratio 4.46) and re-rupture within the first two seasons (Odds Ratio 6.37).

Conclusion: This study of male, professional soccer players with an acute Achilles rupture found that the majority returned to play at an average of 274 days post-injury.

Grassi, A., et al. Eighty-Two Percent of Male, Professional Football (Soccer) Players Return to Play at the Previous Level Two Seasons after Achilles Tendon Rupture Treated with Surgical Repair. *Br J Sports Med.*

2019. doi:10.1136/bjsports-2019-100556.

LIMITING FULL CONTACT PRACTICE AND CONCUSSION IN HIGH SCHOOL FOOTBALL

A national study of 20 popular high school sports in the United States found American football to have the highest rate of diagnosed concussions. In an attempt to impact this problem, the Wisconsin Interscholastic Athletic Association (WIAA) passed rules limiting contact during practice for the 2014 season. This study documented the effects of this rule change.

Data were collected in a convenience sample of high schools in Wisconsin during the 2012, 2013 and 2014 seasons. Athletic trainers measured baseline concussion symptoms before the start of the season and then recorded athlete exposures (AEs), concussion incidence and days lost for each sport related concussion. Under the new rules, competition/full contact was not allowed in the first week and was limited to 75 minutes during week two and limited to 60 minutes per week during week three and beyond.

The concussion rate in season 2012 was 8.7% and in season 2013 was 9.4%. In the 2014 season, this rate fell to 7.1%, significantly less than in the previous seasons ($p=0.003$). This change seemed to result from a 57% reduction in the number of concussions sustained during practice, with no significant change in the concussion rate during competition.

Conclusion: This study found that, after a rule change which limited full contact during practice, a significant reduction was realized in the annual concussion rate in high school football players.

Pfaffer, A., et al. Effect of a New Rule Limiting Full Contact Practice on the Incidence of Sport-Related Concussion in High School Football Players. *Am J Sports Med.* 2019, August; 47(10): 2294-2299.

WITHHOLDING JOINT REPLACEMENT IN THE MORBIDLY OBESE

Lower extremity joint replacement is associated with a relatively low complication rate. However, morbid obesity has been associated with an increased risk of complications following surgery, including infection,

early failure and worse functional outcome. As a result, these surgeries are often withheld until weight can be optimized. This study reviewed the outcomes of morbidly obese patients who requested these surgeries.

Subjects were 289 patients seen between 2014 and 2015 at one orthopedics center. All had a body mass index (BMI) of over 40 kg/m², with weight serving to disqualify them from joint replacement. These patients were informed of the risk associated with arthroplasty among the morbidly obese and were given details regarding two bariatric practices in the community. The participants were prospectively followed to review their outcomes.

At a median of 2.2 years, 72% of the cohort had not undergone arthroplasty. Only 23% attended a bariatric appointment, and, of these, only 21% underwent bariatric surgery. Of those who eventually underwent joint replacement surgery, only 39.7% had successfully achieved a body mass of less than 40 kg/m² at the time of surgery.

Conclusion: This study of patients with end-stage osteoarthritis who were initially rejected for joint replacement due to a high body mass index found that only 20% ultimately underwent joint replacement, with the majority of these remaining morbidly obese at the time of surgery.

Springer, B., et al. What Are the Implications of Withholding Total Joint Arthroplasty in the Morbidly Obese? *Bone Joint J.* 2019; 101-B (7 suppl C): 28-32.

MANAGING ACUTE ACHILLES RUPTURE

The rate of Achilles tendon ruptures has increased in the past 10 years. During that time the management of these injuries has also evolved. This study evaluated the efficacy of different treatment options.

This literature review included randomized controlled trials of patients with an acute Achilles tendon rupture that compared interventions or rehabilitation regimens. The treatments reviewed included: A) nonoperative treatment with accelerated rehabilitation; B) minimally invasive surgery with accelerated rehabilitation; C) open surgery with accelerated rehabilitation; D) nonoperative treatment with early immobilization; E) minimally invasive surgery with

early immobilization; F) open surgery with early immobilization.

Of the studies reviewed, 21 were chosen with a total of 2,060 patients included in the analysis. The mean incidence of major complications was 9.13%. The risks of major complications were significantly lower among those in groups B, C, E, and F as compared to group D (relative risk of 0.22, 0.18, 0.23, and 0.42, respectively). Using the surface under the cumulative ranking curve (SUCRA) method to determine the overall effectiveness of each treatment, the best treatment was found to be group B with the worst group D.

Conclusion: This literature review and meta-analysis suggests that among the treatments for an acute rupture of the Achilles tendon, those treated with minimally invasive surgery followed by accelerated rehabilitation had the best outcome with the least complications.

Wu, Y et al. Complications in the Management of Acute Achilles Tendon Rupture: A Systematic Review and Network Meta-analysis of 2060 Patients. *Am J Sports Med* 2019, September; 47 (9): 2251–2260.

ANTICHOLINERGICS AND DEMENTIA

In the elderly, the short-term side-effects of anticholinergic drugs include confusion and memory loss. It is uncertain whether long-term use increases the risk of dementia. This study assessed the risks of dementia associated with different types of anticholinergic medication use among those 55 years of age or older.

This nested, case control study included data from the QResearch database, including more than 30 million adults in England. Subjects were patients 55 years of age or older without a diagnosis of dementia at study entry. Those diagnosed with dementia during follow-up were compared to five individuals without this diagnosis. Anticholinergic drug exposure was quantified by total standardized daily doses (TSDDs).

The base cohort comprised 3,638,582 individuals 55 to 100 years of age, of whom 128,517 were diagnosed with dementia during follow-up. In the years before the index date, 56.6% of case patients and 51% of controls had been prescribed at least one anticholinergic drug, with a mean of six in the dementia group and four in the control group. Compared to nonuse,

the adjusted odds ratios (AORs) associated with total cumulative anticholinergic exposure in the years before the index date increased from 1.06 for one to 90 TSDDs to 1.49 in the highest exposure group (>1095 TSDDs). Associations were stronger in cases diagnosed before the age of 80 years.

Conclusion: This nested case control study found an increased risk of dementia with anticholinergic medication use.

Coupland, C., et al. Anticholinergic Drug Exposure and the Risk of Dementia: A Nested, Case-Control Study. *JAMA Intern Med.* 2019, July; 179 (8): 1084-1093.

HEARING LOSS AS A RISK FACTOR FOR DISABILITY

Hearing loss is a common chronic condition affecting older adults. This literature review was designed to better understand the association between hearing loss and disability in older adults.

A comprehensive literature search was conducted through December 2018 for studies of patient 60 years of age or older, diagnosed with hearing loss in one or both ears. Study outcomes included disabilities, impairments, and activity limitations.

Data were analyzed from 20 studies that met the inclusion criteria. Several studies found that, compared to those with normal hearing those with more severe hearing loss had a greater likelihood of mobility limitations. Others found that hearing loss was associated with dependency in activities of daily living (ADL), as well as instrumental activities of daily living (IADLs). The majority of the studies identified that hearing loss as associated with a reduction in time spent out of the home, withdrawal from leisure activity and participation in social/leisure events.

Conclusion: This systematic review evaluated the association between hearing loss and disability in older adults, demonstrating that hearing loss significantly reduced social participation and increased disability.

Lin, T et al. Hearing Loss Is a Risk Factor of Disability in Older Adults: A Systematic Review. *Arch Gerontol Geriatr.* 2019, Nov-Dec; 85:

INCIDENCE OF DEMENTIA AND ALZHEIMER DISEASE OVER TIME

Data have suggested that the prevalence of dementia will nearly quadruple in the next 40 years. This systematic review and meta-analysis was designed to better understand the change over time in the incidence of Alzheimer disease (AD) and dementia.

A literature search was completed through June 30, 2017. From this search were chosen 53 studies of dementia with a total of 123,035 individuals included in the analysis. The median length of follow-up was five years. For the AD study, 35 cohorts including 89,076 individuals were reviewed with a median follow-up of 4.5 years. Data were assessed for age-specific incidence rates. Time trends were assessed for three age groups including 65-74 years, 75-84 years, and 85 years and older.

For dementia, each 10-year increase in birth year was associated with an 80% reduction in the odds of incident dementia for those reaching the age of 65-74 years ($p < 0.001$). The reduction in the odds of incident dementia was 80% for those reaching the age of 75-84 years ($p < 0.001$), and 28% for those 85 years of age or older ($p = 0.01$).

For Alzheimer's disease, there was no significant association between birth year and incidence rates for any of the three age groups. The AD incidence rates reported from Western countries was steady over time in all age groups, while studies in non-Western countries showed a significant increase in AD incidence rates for the 65-74 years age group ($p = 0.04$).

Conclusion: This meta-analysis found that, in Western Countries, the incidence rates for dementia are declining, while those for Alzheimer disease are not.

Gao, S et al. Incidence of Dementia and Alzheimer Disease over Time: A Metaanalysis. *Am J Geriatr Psychiatry.* 2019, July; 67(7):1361–1369.

INSOMNIA AND SYMPTOM SEVERITY IN FIBROMYALGIA

Fibromyalgia (FM) is a complicated chronic pain syndrome affecting up to five percent of the general population. This study assessed the relationship between insomnia and symptom severity in patients with FM.

Data were retrieved from the Longitudinal Health Insurance Database 2010 (LHID2010) which includes medical claims data and registration files of one million

(Continued from page 2)

Justin Kim, M.D.
Majid Makeny, M.D.
Theodora Wong, M.D.
University of California/Irvine, CA

*Brittany Mays, M.D.
University of Miami, Miami, FL

*Vanessa Wanjeri, M.D.
University of Pennsylvania, Phil, PA

*Aileen Giordano, M.D.
University of VA, Charlottesville, VA

*Amy Unwin, M.D.
University of Washington, Seattle, WA

*Adem Aktas, D.O.
Alexandra Fogarty, M.D.
Christian Morris, M.D.
Michael Sookchoff, M.D.
Washington University, St. Louis, MO

Executive Editor Emeritus
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Subscription Manager
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Taiwanese. From these data were identified patients with incident FM. The data were also reviewed for a primary or secondary diagnosis of insomnia, as well as FM-related medications. The data were reviewed for an association between insomnia and healthcare visits.

Data were obtained for 5,466 patients with FM and insomnia (FM-I), and 12,454 patients with FM without insomnia. Compared to the FM group, those in the FM-I group had a greater incidence of depression and anxiety, as well as prescriptions for antidepressants, gabapentin, muscle relaxants and opioids ($p < 0.001$ for all comparisons), and pregabalin use ($p = 0.002$). Compared to the FM group those in the FM-I group had a higher number of clinic visits, and a higher cost per ambulatory visit ($p < 0.001$).

Conclusion: This retrospective study found that, among patients with a diagnosis of fibromyalgia, those with a concurrent diagnosis of insomnia had an elevated number and cost of ambulatory visits.

Huang, C et al. Insomnia Increases Symptom Severity and Healthcare Utilization in Patients with Fibromyalgia: A Population Based Study. *Clin J Pain.* 2019, September; 35(9):780-785.

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