

# REHAB IN REVIEW

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## CRASH RISK PREDICTORS IN OLDER DRIVERS

By the year 2030, there will be more than 70 million people in the US 65 years of age and older, with 85-90% of them licensed to drive. Previous studies have demonstrated that the stoppage of driving in this population may contribute to a variety of health problems, especially depression. This study reviewed the individual characteristics associated with an increased risk of crashes.

A convenience sample included drivers, 60 years of age or older, with a valid driver's license and driving at least two days per week. All were evaluated with a car simulator training device, which presented a number of scenarios requiring avoidance of crashes with cars, pedestrians and non-motorized vehicles. Measurements were made of hand grip strength, functional reach, plantar flexor muscle strength, dynamic balance, rotation of the cervical spine, visual acuity, and cognition. The dependent variable was the number of crashes.

Data were analyzed for 100 drivers, with a mean age of 73 years and a mean of 48 years of driving experience. During the driving simulation tests the mean number of crashes was 1.8. The variables most associated with crashes in the simulator were advanced age and functional reach.

**Conclusion:** This study of elderly drivers found that the risk of crashing in a driver simulation laboratory was associated with advanced age and shorter functional reach.

Silva, V., et al. Crash Risk Predictors in Older Drivers: A Cross-Sectional Study Based on a Driving Simulator and Machine Learning Algorithms. *Int J Environ Res Public Health*. 2023 Mar; 20(5): 4212.

## CHRONIC PAIN AND DEMENTIA

Several studies have investigated the association between

musculoskeletal pain and cognitive decline. This study reviewed the association between chronic pain at multiple sites and the risk of incident dementia.

Data were analyzed from 356,383 participants with a mean age of 56.5 years. During a median follow-up of 13.3 years, 4,959 new dementia events were recorded, including 2,083 with Alzheimer's disease (AD), 1,092 with vascular dementia, and 166 with frontotemporal dementia. A significant association was found between the number of chronic pain sites and the risk of new onset dementia. Compared to those with no painful sites, the hazard ratios for those with one, two, three, and four sites, and all over body pain were 1.19, 1.56, 1.95, 2.51, and 2.41, respectively ( $p < 0.001$  for all). After adjusting for confounding factors, the association between chronic pain remained significant for all cause dementia, AD dementia, and vascular dementia ( $p < 0.001$  for all).

**Conclusion:** This study, using a population-based cohort, found that chronic pain, especially in multiple sites, was associated with an increased risk of dementia.

Tian, J., et al. Association between Chronic Pain and Risk of Incident Dementia: Findings from a Prospective Cohort. *BMC Med*. 2023; 21: 169.

## RISK OF POST-TRAUMATIC OSTEOARTHRITIS OF THE KNEE

While the pathogenesis of osteoarthritis (OA) is incompletely understood, acute joint injury has been found to increase the risk of OA. This study describes the development of OA over time after acute knee injury.

Data were obtained from the United Kingdom Biobank, a large-scale biomedical database combining medical and genetic data from over 500,000 participants. The biobank was queried for injuries to the knee and subsequent development of

degenerative joint disease, including knee OA. Knee OA was defined as diagnostic or procedure codes in the medical records compatible with definite, probable, or possible knee OA and/or total knee replacement/revision. The patients were matched to non-injured controls in a 1:10 ratio. Genome-wide association studies (GWAS) were employed to assess genetic associations for traits related to knee injury and subsequent post-traumatic OA of the knee.

From a review of 502,465 records, 4,233 patients were identified as having had a knee injury at a mean age of 34.1 years. Compared to controls, the injured subjects had an increased risk of future knee OA, with a hazard ratio of 1.81. Within the first five years, the risk of future OA among injured individuals compared to controls was at its highest, with a hazard ratio of 3.26. A review of genetic data failed to identify any single nucleotide polymorphisms (SNPs) contributing to an increased risk of OA.

**Conclusion:** Using data from a large-scale British biobank, this study found that knee injuries substantially increase the likelihood of developing OA in the future, with the greatest risk occurring within the initial five-year period.

Hollis, B., et al. Lifetime Risk and Genetic Predisposition to Post-Traumatic OA of the Knee in the UK Biobank. *Osteoarthr Cartil*. 2023: In press. doi.org/10.1016/j.joca.2023.05.012.

## METFORMIN FOR PREVENTING POST-TRAUMATIC KNEE OSTEOARTHRITIS

Persons experiencing a major joint injury are at risk of developing post-traumatic osteoarthritis (OA). Metformin, a diabetes drug with pleiotropic biological effects, has been shown to prevent post-traumatic OA in multiple animal models. This study assessed the efficacy of this drug for preventing OA among

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patients undergoing anterior cruciate ligament (ACL) or meniscal surgery.

The subjects were identified from an insurance database covering over 215 million individuals in the United States. This database was queried for individuals with an ACL or meniscal surgery between 2006 and 2020. The patients' records were reviewed for exposure to metformin use or one of a class of sulfonylureas. The records were reviewed for claims of OA or total knee replacement. Those using metformin were compared to non-users.

Subjects were 2,376 individuals with a mean age of 34.9 years, who underwent ACL or meniscal surgery. Of those without presurgical OA, 10.8% (181/1675) of metformin users developed OA, compared to 17.9% of those who did not use metformin. In addition, a TKR occurred within five years of surgery in 3% of those who used metformin and in 5.3% of those who did not use metformin.

**Conclusion:** This study of patients undergoing anterior cruciate ligament repair or meniscal surgery found that those using metformin had a reduced risk of experiencing osteoarthritis or a total knee replacement.

Jafarzadeh, S., et al. Comparative Effectiveness of Metformin in Preventing Post-Traumatic Knee Osteoarthritis. **Osteoarthr Cartil.** 2023; 31: S239.

**DEPRESSION AND ANXIETY EFFECTS ON TOTAL HIP OR KNEE ARTHROPLASTY RECOVERY**

Depression and anxiety are common comorbidities that have been identified as possible risk factors for complications following total hip arthroplasty (THA) and total knee arthroplasty (TKA). The purpose of this study was to determine the prevalence of pre-operative depression and anxiety disorders and to determine their impact on complications after THA or TKA.

This retrospective study included 15,504 patients treated at the Mayo Clinic. Pre-operative depressive or anxiety disorders were identified by ICD-10 diagnosis code, or the use of medications targeting these conditions. Clinical characteristics and outcomes were obtained from the Mayo Clinic's total joint registry and electronic medical records.

A pre-operative diagnosis of depression or anxiety was found in 30% of those undergoing a primary THA and 32% undergoing primary

TKA. Compared to those without depression or anxiety, pre-operative depression or anxiety disorders were associated with a risk of infection after a TKA and after a THA (hazard ratio (HR) 1.5 and 1.9 respectively). Depression or anxiety was also associated with an increased risk of revision of a TKA or THA (HR 1.8 and 1.7 respectively). At two years, those with preoperative depression or anxiety were less likely to report much better joint function than were those without these disorders (p<0.001).

**Conclusion:** This study suggests that pre-operative depressive or anxiety disorders are associated with significantly increased risk of complications and lower satisfaction in TKA and THA patients.

Harmer, J., et al. Depression and Anxiety are Associated with an Increased Risk of Infection, Revision, and Reoperation Following Total Hip or Knee Arthroplasty. **Bone Joint J.** 2023, May 1;105-B (5):526–533.

**BISPHOSPHONATE USE AND NONUNION OF LONG BONE FRACTURE REPAIR**

Fragility fractures secondary to osteoporosis are a significant cause of morbidity and mortality in the elderly. Currently, bisphosphonates are the gold standard for medical management of osteoporosis. However, existing literature has reached mixed conclusions regarding the safety of bisphosphonate use in the acute fracture setting. This study was designed to help clarify the effect of bisphosphonates or selective estrogen receptor modulators/hormone replacement therapy (SERM/HRT) on fracture site healing.

This retrospective analysis involved Medicare claims from 2016-2019 of patients 65 years of age or older who underwent surgical repair of a long bone fracture. The subjects were followed for one year after surgery to determine fracture union status. Multivariable logistic regression models were used to determine the association between medications and fracture healing.

Data from 111,343 patients with long bone fractures were analyzed. Of these, 10,452 had a nonunion. After controlling for confounding variables, neither bisphosphonates (OR p=1.06) nor SERM/HRT (OR 1.13) were associated with nonunion. In addition, bisphosphonate use within 90 days post-fracture was not

associated with non-union (OR 0.94; p=0.175).

**Conclusion:** In this cohort of patients, use of a bisphosphonate or SERM/HRT was not associated with fracture union status at one year.

Thorne, T., et al. No Increased Risk of Nonunion with Bisphosphonate Use in a Medicare Claims Cohort following Operatively Treated Long-Bone Fractures. *J Bone Joint Surg Am.* 2023, April 5; 105(7): 549-555.

### CEREBELLAR TRANSCRANIAL DIRECT CURRENT STIMULATION AND ARM FUNCTION AFTER STROKE

Transcranial direct current stimulation (tDCS) is a noninvasive neuromodulation technique which has been shown to improve the motor function of patients with stroke. This study assessed the efficacy of tDCS, applied to the cerebellum, in patients with upper extremity dysfunction after stroke.

The subjects were within two weeks to six months of a first-time, unilateral, ischemic stroke. All displayed unilateral upper limb motor dysfunction. The participants were randomized to a tDCS group or a control group, with both groups receiving standard rehabilitation. Prior to each rehabilitation training session, those in the tDCS group received tDCS for 20 minutes at two milliamp, five days per week. The control group received a sham tDCS. The patients' upper limb motor function was assessed with the Fugl-Meyer Assessment of the Upper Extremity (FMA-UE). The primary outcome variable was the change in FMA-UE scores from baseline.

Data were obtained for 39 patients in the tDCS group and 38 patients in the control group. The changes in FMA-UE score on the first day after treatment were 10.7 in the tDCS group and 5.8 in the control group (p=0.013). At 60 days after the end of treatment, the changes from baseline in tDCS were 18.9 in the treatment group and 12.7 in the control group (p=0.043).

**Conclusion:** This study of patients with an ischemic stroke found that transcranial direct current stimulation, applied to the cerebellum, can significantly improve upper extremity motor function.

Gong, Q., et al. Effects of Cerebellar Transcranial Direct Current Stimulation on Rehabilitation of Upper Limb Motor Function after Stroke.

*Front Neurol.* 2023; 14; doi.org/10.3389/fneur.2023:1044333.

### TAI CHI FOR SARCOPENIA IN THE ELDERLY

Sarcopenia is a condition characterized by a gradual decline in muscle mass and strength that can occur with age. This study examined the efficacy of a 12-week Tai Chi program on neuromuscular and posture control in elderly patients with sarcopenia.

Subjects were 60 elderly patients with sarcopenia, randomized to either a Tai Chi group or a control group. Both groups received educational sessions once every two weeks for 12 weeks, while the Tai Chi group engaged in 40-minute Tai Chi sessions three times per week for 12 weeks. At baseline and following treatment, surface electromyography was used to assess the neuromuscular response time of muscles of the lower extremity. Postural control was assessed using the dynamic stability test module in ProKin 254, and the Overall Stability Index (OSI).

Data were completed for 60 participants. After 12 weeks, compared to baseline values, the Tai Chi group exhibited significant improvements in neuromuscular response times of the rectus femoris, semitendinosus, anterior tibialis, and gastrocnemius and the OSI, with no significant change noted in the control group.

**Conclusion:** This study of elderly patients with sarcopenia found that a Tai Chi program of 12 weeks' duration enhanced neuromuscular responses in the lower extremities and improved dynamic posture control ability.

Huang, D., et al. Effects of 12 Weeks of Tai Chi on Neuromuscular Responses and Postural Control in Elderly Patients with Sarcopenia: A Randomized, Controlled Trial. *Front Neurol.* 2023, Apr 28; 14: 1167957.

### SLEEP-WAKE DISTURBANCES AFTER STROKE AND ADVERSE OUTCOMES

Sleep loss and sleep-wake disturbances (SWDs) are thought to be risk factors for brain disorders, including stroke. However, no prior study has investigated the effect of multiple SWDs on subsequent cardio-cerebrovascular events (CCEs).

Subjects 18 to 85 years of age with ischemic stroke or transient ischemic attack were recruited from one of two stroke centers. Sleep disordered breathing (SDB) was assessed using respirography, insomnia using the Insomnia Severity Index (ISI), restless legs syndrome (RLS) using the International RLS Study Group rating scale and self-estimated sleep duration at one and three months. A Sleep Burden Index (SBI) was calculated by combining these four. The primary endpoint was a composite of death from any cause, stroke, transient ischemic attack (TIA), nonfatal myocardial infarction, unplanned hospitalization for heart failure, or unplanned hospitalization for unstable angina leading to urgent revascularization.

Data were obtained from 437 patients with confirmed ischemic stroke. Of these 70 had at least one CCE during follow-up. Compared to patients without a subsequent CCE, the mean SBI was significantly higher for patients with a subsequent CCE (p=0.0003), which was still significant after adjusting for age sex and NIHSS score at admission (p=0.0056) and when excluding TIAs (p=0.0024). As a single component, only sleep duration (p=0.0147) was a significant predictor of CCEs, with more stroke patients reporting longer compared to shorter sleep durations.

**Conclusion:** This study of patients with an ischemic stroke found that those with sleep disordered breathing had an increased risk of subsequent cerebro-cardiovascular events.

Duss, S., et al. Multiple Sleep-Wake Disturbances after Stroke Predict an Increased Risk of Cardio-Cerebrovascular Events or Death: A Prospective Cohort Study. *Euro J Neurol.* 2023 Jun;30(6):1696-1705.

### NIGHTTIME BLOOD PRESSURE AND 10-YEAR MORTALITY

Ambulatory blood pressure (BP) over 24 hours is thought to provide a better assessment of a patient's BP, and of health outcomes, than does a one-time clinic or home BP measurement. This study investigated the associations between long-term usual levels of clinic and ambulatory BP indices, and of hypertension phenotypes, with total and cardiovascular death.

The Spanish Ambulatory Blood Pressure Registry, a national study of patients at 223 centers, collected BP data from March 1, 2004, through

December 31, 2014. Clinic BP was measured using standardized procedures. Thereafter, ambulatory blood pressure monitoring was performed using a validated oscillometric device, acquiring blood pressure at 20-minute intervals during the day and at 30-minute intervals during the night. Records of death were obtained from the Spanish National Institute of Statistics.

Subjects were 59,124 individuals, 18 years of age or older. The mean age at recruitment was 58.7 years. During a median follow-up of 9.7 years, 12.1% of the participants died. An adjusted model found that 24-hour systolic blood pressure (SBP) was more strongly correlated with all-cause death than was BP obtained in the clinic. Compared to those with SBP in the normal range, those with elevated nighttime SBP had an increased hazard ratio for all-cause death (1.45), and cardiovascular death (1.51).

**Conclusion:** This large Spanish study found that ambulatory blood pressure, particularly nighttime systolic blood pressure, was more informative regarding the risk of all cause death and cardiovascular death than was clinic blood pressure.

Staplin, N., et al. Relationship between Clinic and Ambulatory Blood Pressure and Mortality: An Observational, Cohort Study in 59,124 Patients. *Lancet*. 2023. In Press. doi.org/10.1016/S0140-6736(23)00733-X.

### GREEN KIWIFRUIT FOR CONSTIPATION

Functional gastrointestinal disorders (FGIDs) are common and lead to significant morbidity. A recent global epidemiologic survey revealed that the global prevalence of functional constipation (FC) is 11.7% and irritable bowel syndrome (IBS) 1.3%. This study compared the effects of kiwifruit with that of psyllium for bowel habit and comfort.

Eligible participants were 18 to 65 years of age and included healthy controls (HC, n=63), patients with functional constipation (FC, n=60), and those with constipation-predominant IBS (IBS-C, n=61). The subjects were randomized to receive a daily dose of two zespri green kiwifruits (*A. chinensis* var. *deliciosa* "Hayward") or 7.5 g of psyllium for four weeks, with the order reversed for another four weeks. All subjects kept a daily bowel health diary. The primary outcome variable was the

number of complete, spontaneous bowel movements (CSBM) per week. Secondary outcomes involved GI comfort, including the Gastrointestinal Symptom Rating Scale (GSRS).

Between June 12, 2014, and June 17, 2017, 169 participants completed the study. The primary outcome of an increase of 1.5 CSBM per week was achieved in the FC group ( $p < 0.0001$ ), the IBS-C group ( $p = 0.0003$ ), and the combined FC + IBS-C ( $p < 0.0001$ ) groups after the kiwifruit intervention. After the psyllium intervention, the primary outcome was observed only in the IBS-C group (mean 1.87,  $p = 0.0051$ ). In the combined FC + IBS-C group, the effect of kiwifruit was significantly greater than that of psyllium ( $p = 0.038$ ).

**Conclusion:** This study of patients with constipation found that daily consumption of two green kiwifruits improved gastrointestinal discomfort, with improvement greater than that found with psyllium.

Geary, R., et al. Consumption of 2 Green Kiwifruits Daily Improves Constipation and Abdominal Comfort-Results of an International Multicenter Randomized Controlled Trial. *Am J Gastroenterol*. 2023 Jun 1;118(6):1058-1068. **Am J Gastroenterol**. 2023 Jun 1;118(6):1058-1068.

### SERUM TRYPTOPHAN METABOLITES AND HAND OSTEOARTHRITIS

Osteoarthritis (OA) affects more than 528 million people worldwide. Recent data suggest a link between tryptophan (Trp) and inflammatory process with dysfunction of the gut microbiome. The role of Trp and its metabolites in OA is unknown. This study evaluated the association between Trp metabolism and OA of the hand (HOA).

Data were obtained from the Digital Cohort Design (DIGICOD), a French, hospital-based study of patients with symptomatic HOA. Patients underwent clinical assessment of the hand, general examination, fasting blood sampling, and hand radiography, scored by Kellgren Lawrence (KL) grade and Verbruggen Veys scores. Baseline concentrations of 20 tryptophan metabolites were measured for comparison between those with HOA and those without HOA. A multivariate logistic regression was used to compare between non-erosive and erosive HOA patients with adjustments for age, BMI and gender.

Of 416 patients, 33.8% were found to have erosive HOA. The data identified four Trp metabolites, nine metabolite-ratios and one metabolite-pathway which were differentially associated with erosive HOA. Levels of Trp were decreased in those with erosive HOA ( $p = 0.007$ ). Those with E-HOA had increased levels of the enzymes Kynureninase and Kynurenine 3-mono oxygenase ( $p = 0.002$ ,  $p = 0.002$  and  $p = 0.021$  respectively). In the serotonin pathway, 5-OH-Trp and 5-OH-Tryptophane/Trp ratios were significantly increased in those with E-HOA ( $p = 0.002$ ).

**Conclusion:** This study found that Trp metabolites disturbance, resulting from processes occurring in the gut microbiome, are associated with erosive osteoarthritis of the hand.

Binvignat, M., et al. Serum Tryptophan Metabolites Are Associated with Erosive Hand Osteoarthritis and Pain: Results from the DIGICOD Cohort. **Osteoarthr Cartil**. 2023: doi.org/10.1016/j.joca.2023.04.007. Epub ahead of print.

### RETURN TO PLAY FOLLOWING SLAP REPAIR

A recent study found that high school softball players report a mean of 1.14 shoulder injuries per 10,000 athletic exposures. This study of fast pitch softball pitchers compared the outcomes of those treated with traditional surgical repair versus those treated with biceps tendonosis.

Data were obtained from the records of patients seen from 2001 to 2019 at the Andrews Sports Medicine and Orthopedic Center in Birmingham, Alabama. The records were reviewed for fast pitch softball pitchers treated for a superior labral anterior-posterior (SLAP) tear and recalcitrant biceps tendonitis. The outcomes were compared between those treated with a biceps tenodesis and those treated surgically with a traditional SLAP repair.

Data were analyzed for 77 players with a mean follow-up time of 4.6 years. Of these, 94% returned to competition at the same or a higher level. Of the 18 SLAP repair patients, 17 (94%) returned to full competition at an average of 7.9 months. Of the 29 patients who underwent biceps tenodesis, 27 (93%) returned to full competition at an average of 7.1 months.

**Conclusion:** This study of fast pitch softball players who underwent surgical repair of a SLAP lesion found that 94% return to competition at the same level or higher, with no significant difference between those receiving a SLAP repair and those receiving a biceps tenodesis.

Rothermich, M., et al. Clinical Outcomes and Return to Play in Softball Players following SLAP Repair or Biceps Tenodesis. *J Shoulder Elbow Surg.* 2023, May;32(5):924-930.

### MEDITERRANEAN DIET AND INCIDENT TYPE II DIABETES

The Mediterranean diet, which is high in vegetables, legumes, fruit, nuts, grains, fish, seafood, and virgin olive oil, has been linked to a lower incidence of multiple noncommunicable diseases. This study examined the relationship between adherence to the Mediterranean diet and the development of type 2 diabetes (T2D)

A biomarker score was created based on five circulating carotenoids and 24 fatty acids that discriminated between the Mediterranean diet and the habitual diet arms of a previous study (Medley trial). These biomarkers were applied in the observational study, the European Prospective Investigation into Cancer and Nutrition (EPIC)-InterAct case-cohort study, to assess the association of the biomarker score with T2D incidence over an average of 9.7 years of follow-up.

The data for this study were gathered from 22,202 participants, of whom 9,453 developed T2D cases. A multivariable model showed that the hazard ratio for developing T2D for the top fifth of the biomarker scores, compared to the bottom fifth was 0.38. An increase in the biomarker score by 10 percentile points reduced the incidence of type II diabetes by 11%.

**Conclusion:** This study demonstrated that a biomarker score could objectively reflect adherence to the Mediterranean diet and that increased adherence could reduce the burden of type 2 diabetes.

Sobiecki, J., et al. A Nutritional Biomarker Score of the Mediterranean Diet and Incident Type 2 Diabetes: Integrated Analysis of Data from the MedLey Randomized, Controlled Trial and the Epic-Interact Case-Cohort Study. *PLoS Med.*

Published online 2023 Apr; 20(4): e1004221.

### CYCLOBENZAPRINE USE IN THE EMERGENCY DEPARTMENT FOR BACK PAIN

Musculoskeletal back pain (MBP) is thought to have a lifetime prevalence of 75%. Cyclobenzaprine is a frequently prescribed medication for the treatment of MBP, though the literature supporting its use for musculoskeletal pain remains unclear. This study evaluated the use of cyclobenzaprine in emergency departments (Eds) in the United States.

This retrospective, cohort study obtained data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) between 2007 and 2019. Those data were reviewed to identify the percentage of visits that involved the administration and prescription of cyclobenzaprine.

Data were reviewed for an estimated 1.35 billion visits to Eds from 2007 to 2019. During that time, 2.4% of all visits involved administration of cyclobenzaprine in the Ed. Only 0.5% received a prescription of cyclobenzaprine both in the Ed and as a prescription at Ed discharge. A time series analysis demonstrated that the percentage of patients given cyclobenzaprine in the Ed has fallen over time.

**Conclusion:** This study of patients with low back pain seen at the emergency department in the U.S. found that 2.4% of the visits resulted in treatment with cyclobenzaprine, with this percentage falling between the years 2007 and 2019.

Pourmand, A., et al. Cyclobenzaprine Utilization for Musculoskeletal Back Pain: Analysis of 2007 to 2019 National Hospital Ambulatory Medical Care Survey Data. *Am J Emerg Med.* 2023 June; 68:106-111.

### REPETITIVE CORTICOSTEROID INJECTION AND TENNIS ELBOW SURGERY

Lateral epicondylitis (LE) is a chronic tendinopathy/overuse disorder that can cause occupational or recreational disability. For recalcitrant LE, surgical intervention often involves the release of the extensor carpi radialis brevis, with decortication and drilling multiple holes at the lateral epicondyle,

without reattachment of the extensor tendon. As corticosteroid (CS) injection is the most common nonoperative treatment method, this study evaluated the effect of multiple such injections on the outcome of those who subsequently were treated with a surgical release.

Between January of 2007 and December of 2019, 313 patients underwent surgical treatment for LE. The total number of injections (TNI) of corticosteroids before surgery was determined by medical record review. All patients were evaluated at baseline and post-surgery for range of motion, for pain, using a pain visual analog scale (VAS) score (0 to 10 points), a Mayo Elbow Performance Score (MEPS; 0 to 100 points), and a Disabilities of the Arm, Shoulder, and Hand (DASH) score (0 to 100 points). The TNI was compared to outcomes measures after surgery.

At a mean post operative follow-up of 42.9 months, the mean number of injections prior to surgery was 4.33. The TNI was not associated with the postoperative change in visual analogue pain scores, grip power, and wrist extension power, or the scores on the Disabilities of the Arm Shoulder and Hand (DASH) or the Mayo Elbow Performance Score (MEPS).

**Conclusion:** This study of patients with lateral epicondylitis found that the number of corticosteroid injections prior to surgical intervention did not affect postoperative outcomes.

Ha, C., et al. Effect of Repetitive Corticosteroid Injection on Tennis Elbow Surgery. *Am J Sports Med.* 2023, June: 51(7):1886-1894.

### DEEP GLUTEAL PAIN SYNDROME

Deep gluteal pain syndrome is a condition characterized by the presence of pain and thought to be caused by extra-pelvic and non-discogenic entrapment of the sciatic nerve. Patients often note posterior gluteal pain with the inability to sit for more than 30 minutes, posterior hip pain radiating to the posterior thigh, and paresthesia of the involved limb. Several studies have described fibrous or fibrovascular formation in the subgluteal area that limits the excursion of the sciatic nerve. This study describes an endoscopic technique to release sciatic nerve in patients who are diagnosed with deep gluteal pain syndrome.

This prospective observational study included 57 patients with deep

gluteal syndrome with more than six months of pain, each of whom underwent surgical intervention between 2014 and 2019. All subjects underwent surgical release of fibrotic bands from the sciatic nerve. In all cases, a functional evaluation using the modified Harris Hip Score (mHHS), the 12-item International Hip Outcome Tool (iHOT-12), and the visual analog scale (VAS) for pain were obtained. The primary outcome measures were the iHOT and the VAS.

At a mean follow-up of 22.7 months, the median scores on the mHHS improved from 59 points to 84 points ( $p < 0.01$ ). The median iHOT-12 scores improved from 50 pts to 85 pts ( $p < 0.01$ ). The median VAS pain scores improved from seven to two. Postoperative complications occurred in 12% of patients: one patient with extensive symptomatic hematoma, three patients with hypoesthesia, and three patients with dysesthesia.

**Conclusion:** This study of patients seen for deep gluteal pain syndrome found that endoscopic release of the sciatic nerve provided a good to excellent functional outcome.

Parodi, D., et al. Deep Gluteal Pain Syndrome: Endoscopic Technique and Medium-Term Functional Outcomes. *J Bone Joint Surg Am.* 2023 May 17;105(10):762-770.

### PROGNOSTIC SIGNIFICANCE OF ELECTRICAL STIMULATION FOR CERVICAL SPONDYLOTIC MYELOPATHY

Cervical spondylotic myelopathy (CSM) is the most common disorder presenting with spinal cord dysfunction. Surgical intervention can produce relatively good outcomes, with early recovery mainly due to the reversal of spinal cord ischemia due to spinal cord compression. As electrical stimulation of peripheral nerves has been shown to temporarily increase blood flow within the spinal cord (30 min to 1 h), the authors postulated that this could be used as a test of the viability of the CNS. This study assessed the utility of electrical peripheral nerve stimulation (ePNS) as a prognostic test of the viability of the injured spine.

This prospective cohort study recruited consecutive patients seen for a C3-C7 laminoplasty. The Japanese Orthopedic Association (JOA) scoring system was used as an indicator of the severity of cervical

myelopathy. The ePNS was used as a quantitative assessment of motor disability of the upper extremities. The ePNS was delivered at the ulnar nerve at five Hertz and maintained for five minutes. The primary outcome variable was the change in upper extremity (UE) function, as measured by the 10-second test.

Data were gathered from 44 patients with an average duration of symptomatic stenosis of 20.5 months. The mean JOA score improved from 9.3 points preoperatively to 12.2 points at discharge ( $p < 0.001$ ). Post-surgical gain in UE function, as measured by the 10-second test, was correlated with motor function recovery post-surgery ( $p < 0.001$ ).

**Conclusion:** Early postoperative outcomes after cervical spondylotic myelopathy surgery can be predicted by results from preoperative ePNS.

Murata, S., et al. Using Electrical Stimulation of the Ulnar Nerve Trunk to Predict Postoperative Improvement in Hand Clumsiness in Patients with Cervical Spondylotic Myelopathy. *Spine.* 2023, May 15;48(10): 702-709.

### IMPACT OF ANTERIOR CRUCIATE LIGAMENT SURGERY ON OSTEOARTHRITIS

Osteoarthritis (OA) is the most common form of arthritis worldwide, and a major cause of disability. The frequency of total knee replacement for knee OA 20 years after anterior cruciate ligament (ACL) injury is seven times that of the uninjured population. This study was designed to better understand the relative impact of the surgical repair process on the development of OA.

A literature search was employed to identify studies of patients with ACL tears that compared the outcomes of surgical versus non-surgical repair. Of the 958 studies reviewed, three randomized controlled trials, involving 343 participants, were included in the analysis. The main outcome was the difference between groups in the change in OA from baseline.

At 2-11 years follow up, based on the x-ray scores, those undergoing ACL repair had a greater risk of developing OA than did those treated non-surgically (Relative Risk (RR) 1.72).

**Conclusion:** This meta-analysis of randomized controlled trials suggests that those who undergo surgical repair of an injured ACL have an increased risk of developing

osteoarthritis.

Ferrero, S., et al. Impact of Anterior Cruciate Ligament Surgery on the Development of Knee Osteoarthritis: A Systematic Literature Review and Meta- Analysis Comparing Non-Surgical and Surgical Treatments. *Osteoarthr Cartil Open.* 2023. doi: 10.1177/ 19476035211046041.

### EPIDEMIC OF LONELINESS

The United States Surgeon General publishes "advisories", that are reserved for significant public health challenges that require the nation's immediate awareness and action. This year an advisory was released, entitled "Our Epidemic of Loneliness and Isolation". This paper is a summary of a recently published advisory on loneliness and isolation.

This advisory was established through consultations with over 50 subject matter experts and a review of the literature of sociology, psychology, neuroscience, political science, economics, and public health. The data were summarized in a review of the findings, followed by recommendations for action.

The literature review found that loneliness and social isolation increase the risk of premature death by 26% and 29% respectively. Others found that approximately half of US adults indicate that they experience loneliness. Objective measures of social exposure indicate that the average time and social isolation/spent alone increased from 2003 (142.5 hours) to 2019 (154.5 hours), and 2020 (166.5 hours). This decline was greatest among young people 15-24 years of age where time spent in person with friends has been reduced by 70% over two decades. The percentage of Americans living alone increased from 13% in 1960 to 29% in 2022. In 2019, 70% of Americans noted that they belonged to a church, falling to 47% in 2020. The hazard ratio of premature mortality due to social isolation now exceeds that of smoking up to 15 cigarettes per day, drinking six alcoholic beverages per day, lack of physical activity, obesity and air pollution. Beyond the medical sequelae, loneliness and isolation are associated with lower academic achievement and worse performance at work.

The Surgeon General suggests that there must be a national strategy to advance social connectivity. These are: 1) strengthen social infrastructure and local communities;

2) enact pro-connection public policies; 3) mobilize the health sector; 4) reformed digital environments; 5) deepen our knowledge; 6) build a culture of connection. These are explained in this advisory and include suggestions for formal training, adequate reimbursement for time spent on social connection issues, a call to integrate social connection as an intrinsic part of patient care, and a call to work with community organizations to provide support for people at risk.

**Conclusion:** The paper identifies an epidemic of loneliness in the United States, the health risks associated with this epidemic, and provides suggestions for government participation in alleviating this epidemic.

US Department of Health and Human Services. Our Epidemic of Loneliness and Isolation, 2023: The US Surgeon General's Advisory on the Healing Effects of Social Connection and Community. 2023, May.

### **SOCIAL HEALTH AND COGNITIVE CHANGE IN OLD AGE**

Today, there are 50 million people living with dementia worldwide, with this number expected to double in the next decade. Social isolation has gained attention as a potentially modifiable risk factor. This study investigated the association between social health (social network size, social engagement, and social support) and the rate of cognitive decline.

Participants were drawn from the Swedish National Study on Aging and Care-Kungsholmen Brain Magnetic Resonance Imaging study. The subjects were community dwelling adults  $\geq 60$  years of age, without dementia or neurologic disorder at baseline. A composite of social health was computed by combining social connections, social support and engagement and leisure activities at baseline. The subjects were queried about social connections and social support, and their engagement in the past 12 months in 26 predefined leisure activities that involved social, mental or physical components. Social network and leisure activity were combined to create the social health index (SHI). Baseline MRIs were used to estimate total brain tissue volume (TBTv) as a measure of brain reserve. Cognition was assessed by neuropsychological testing. Covariates included education status, smoking, alcohol

consumption, body mass index, blood pressure and chronic medical conditions.

The 368 subjects were followed for 12 years. A multi-adjusted mixed effect models analysis found that moderate-good SH was associated with slower cognitive decline ( $p = 0.018$ ). In addition, moderate-large TBTv was correlated with slower cognitive decline ( $p < 0.001$ ). Further analysis found that moderate to good social health was associated with higher cognitive levels, only among participants with moderate to large TBTv.

**Conclusion:** This community based Swedish study of adults 60 years of age or older found that social health and moderate to large total brain tissue volume were separately associated with a slower cognitive decline.

Marseglia, A., et al. Social Health and Cognitive Change in Old Age: Role of Brain Reserve. *Ann Neurol.* 2023, April; 93(4):844-855.

### **KETAMINE VERSUS ECT FOR TREATMENT-RESISTANT DEPRESSION**

Major depressive disorder is a leading cause of disability worldwide. While antidepressants are widely available, their effectiveness is suboptimal in more than one-third of patients. For patients with treatment-resistant depression (TRD), electroconvulsive therapy (ECT) is one of the more effective treatments. Ketamine, an N-methyl-D-aspartate receptor antagonist, has been approved by the Food and Drug Administration as a sedative, analgesic and general anesthetic. Over the past two decades, ketamine, administered intravenously at sub-anesthetic doses, had been found to have a rapid antidepressant effect. This study compared the efficacy of ketamine to that of ECT for patients with TRD.

This trial was a prospective, open-label, randomized, noninferiority trial that was conducted at five sites: an urban community hospital (Lutheran Hospital, Cleveland Clinic), a Veterans Administration hospital (Baylor College of Medicine), and three university hospital-based centers (Yale University School of Medicine, Johns Hopkins Medical Institute, and Mount Sinai School of Medicine).

Patients with TRD were randomized to receive either ketamine or ECT. Ketamine was

administered intravenously at the accepted subanesthetic dose of 0.5 mg per kilogram of body weight over a 40-minute period, twice per week. The ECT group received unilateral ECT three times per week for three weeks. A response to treatment was defined as a decrease of at least 50% in the score on the Quick Inventory of Depressive Symptomatology-Self-Report (QIDS-SR-16). Data were collected for 200 in the ketamine group and 203 in the ECT group.

A response according to the QIDS-SR-16 occurred in 108 of 195 patients (55.4%) in the ketamine group and in 70 of 170 patients (41.2%) in the ECT group. Scores on the GSE-My for patient-reported memory function at the end-of-treatment was better in the ketamine group than in the ECT group.

The scores on the Squire Memory Complaint Questionnaire (SMCQ) at the end-of-treatment visit indicated that there were fewer patient reports of adverse cognitive symptoms in the ketamine group than in the ECT group.

**Conclusion:** This study of patients with treatment-resistant depression without psychotic features found that treatment with ketamine was not inferior to ECT.

Anand, A., et al. Ketamine Versus ECT For Nonpsychotic Treatment-Resistant Depression. *N Engl J Med.* 2023, May 24; doi: 10.1056/NEJMoa2302399. Epub ahead of print.

### **SAFFRON HERBAL TEA AND HAPPINESS IN POSTMENOPAUSAL WOMEN**

Evidence suggests that menopause can be associated with a number of psychological changes including depression and anxiety. In a review study that examined the pharmacological effects of saffron, it was found that crocin in saffron inhibited the reabsorption of dopamine and norepinephrine and that safranal prevented the reabsorption of serotonin, both playing a role in the antidepressant and stimulant function of saffron. This study evaluated the effect of saffron tea on the affect of postmenopausal women.

The subjects were chosen from postmenopausal women referred to community health centers at Larestan University of Medical Sciences, Iran. The subjects were assessed with the Oxford Happiness Questionnaire (OHQ) and then randomized to a

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treatment group or a control group. The control group received a tea, once daily, made of white rock candy in lukewarm water. The treatment group received the Saffron tea once per day, made by using 30 milligram dried stigmas of the saffron plant, prepared in 300 mls of boiling water for 10 to 15 minutes. The primary outcome measure was the change in OHQ scores and the difference in this change between groups.

Data were completed for 72 women, with a mean age of 53 years at the study baseline, and a mean age at menopause of 47 years. In the treatment group the mean OHQ scores improved from 42.93 to 61.58 ( $p < 0.001$ ). In the control group the mean baseline OHQ score was 43.11 and the mean follow up was 42.75, demonstrating no improvement. The groups did not differ at baseline, while at follow up the treatment group had significantly better OHQ happiness scores ( $p < 0.001$ ).

**Conclusion:** This study of postmenopausal women found that saffron tea, once daily, could improve their subjective happiness.

Delam, H., et al. The Effect of Crocus Sativus L. (Saffron) Herbal Tea on Happiness in Postmenopausal Women: A Randomized Controlled Trial. **BMC Complement Med Ther.** 2023;23:176.

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