

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Infant sleep problems and mother's

J Sleep Res. 2018 May 2:e12696. doi: 10.1111/jsr.12696.

#### **The effects of maternal risk factors during pregnancy on the onset of sleep difficulties in infants at 3 months old.**

Morales-Muñoz I<sup>1</sup>, Saarenpää-Heikkilä O<sup>2</sup>, Kylliäinen A<sup>3</sup>, Pölkki P<sup>4</sup>, Porkka-Heiskanen T<sup>5</sup>, Paunio T<sup>1,6</sup>, Paavonen EJ<sup>1,7</sup>.

Sleep problems in young children are among the most common concerns reported to paediatricians. Sleep is thought to have important regulatory functions, and sleep difficulties in early childhood are linked to several psychosocial and physiological problems. Moreover, several prenatal factors have been found to influence infants' sleep. Among them, most of the studies have been focused on maternal prenatal depression and/or anxiety as potential risk factors for sleep problems in childhood, whereas other relevant psychological factors during pregnancy have not received as much attention.

Therefore, we aimed to examine the effect of several psychiatric maternal risk factors during pregnancy (i.e. symptoms of anxiety, depression, insomnia, alcohol use, seasonality, attention deficit and hyperactivity disorder and/or stressful life events) on the onset of some sleep problems related to sleep quality and sleep practices in 3-month-old infants.

We examined 1,221 cases from a population-based birth cohort, with subjective measures during pregnancy in mothers, and at 3 months after birth in the infants. The findings showed that all the maternal risk factors during pregnancy, except for symptoms of alcoholism and sleepiness, were related to sleep difficulties in infants. Interestingly, attention deficit and hyperactivity disorder symptomatology in mothers during pregnancy was the only variable that predicted more than two sleeping difficulties (i.e. long sleep-onset latency, co-sleeping with parents and irregular sleeping routines) at 3 months old.

Our results highlight the relevance of maternal risk factors during pregnancy, and not only prenatal depression and/or anxiety, as variables to be considered when examining sleep difficulties in infants.

### 8. VISCERA

#### Nuts helps metabolic syndrome

##### **Long-term nuts intake and metabolic syndrome: A 13-year longitudinal population-based study**

Clinical Nutrition — | May 15, 2018

Hassannejad R, et al.

The population-based longitudinal study was conducted on a sub-sample of the Isfahan Cohort Study (ICS) to determine the relationships between long-term nuts intake and the risk of metabolic syndrome (MetS). The sample consisted of one thousand, three hundred eighty-seven adults, aged  $\geq 35$  years. Using the Logistic and Cumulative Logit regressions with considering mixed random effects, the longitudinal relationship between the trend of nuts intake and the risk and severity of MetS was investigated.

After a 13-year follow-up period in a cohort of the Iranian population, nuts intake showed a significant, inverse association with the risk and severity of MetS.

### IBs small intestine bacteria

#### **Testing and treating small intestinal bacterial overgrowth reduces symptoms in patients with inflammatory bowel disease**

Digestive Diseases and Sciences — | May 15, 2018

Cohen-Mekelburg S, et al.

A retrospective cohort study of one hundred forty-seven patients with inflammatory bowel disease (IBD) who were referred for small intestinal bacterial overgrowth (SIBO) breath testing from 1/2012 to 5/2016 was conducted to ascertain whether an improvement in IBD clinical activity scores is seen after testing and treating SIBO. Using Student's t test for continuous variables and Chi-squared or Fisher's exact test for categorical variables, characteristics of SIBO positive and treated patients were compared to SIBO negative patients, including the changes in Partial Mayo Score or Harvey Bradshaw Index (HBI).

In an IBD population, this study examined the clinical effect of testing and treating for SIBO. A significant reduction in HBI was observed after testing for and treating SIBO.

**IBS bacteria**

m J Gastroenterol. 2000 Dec;95(12):3503-6.

**Eradication of small intestinal bacterial overgrowth reduces symptoms of irritable bowel syndrome.**

Pimentel M<sup>1</sup>, Chow EJ, Lin HC.

*OBJECTIVES:*

Irritable bowel syndrome is the most common gastrointestinal diagnosis. The symptoms of irritable bowel syndrome are similar to those of small intestinal bacterial overgrowth. The purpose of this study was to test whether overgrowth is associated with irritable bowel syndrome and whether treatment of overgrowth reduces their intestinal complaints.

*METHODS:*

Two hundred two subjects in a prospective database of subjects referred from the community undergoing a lactulose hydrogen breath test for assessment of overgrowth were Rome I criteria positive for irritable bowel syndrome. They were treated with open label antibiotics after positive breath test. Subjects returning for follow-up breath test to confirm eradication of overgrowth were also assessed. Subjects with inflammatory bowel disease, abdominal surgery, or subjects demonstrating rapid transit were excluded. Baseline and after treatment symptoms were rated on visual analog scales for bloating, diarrhea, abdominal pain, defecation relief, mucous, sensation of incomplete evacuation, straining, and urgency. Subjects were blinded to their breath test results until completion of the questionnaire.

*RESULTS:*

Of 202 irritable bowel syndrome patients, 157 (78%) had overgrowth. Of these, 47 had follow-up testing. Twenty-five of 47 follow-up subjects had eradication of small intestinal bacterial overgrowth. Comparison of those that eradicated to those that failed to eradicate revealed an improvement in irritable bowel syndrome symptoms with diarrhea and abdominal pain being statistically significant after Bonferroni correction ( $p < 0.05$ ). Furthermore, 48% of eradicated subjects no longer met Rome criteria ( $\chi^2 = 12.0$ ,  $p < 0.001$ ). No difference was seen if eradication was not successful.

*CONCLUSIONS:*

Small intestinal bacterial overgrowth is associated with irritable bowel syndrome. Eradication of the overgrowth eliminates irritable bowel syndrome by study criteria in 48% of subjects.

## Appendicitis and prostate CA

**Research Article****Appendicitis before age 20 years is associated with an increased risk of later prostate cancer**

Henrik Ugge, Ruzan Udumyan, Jessica Carlsson, Sabina Davidsson, Ove Andrén, Scott Montgomery and Katja Fall

**DOI:** 10.1158/1055-9965.EPI-17-1204

**Background:** Appendicitis before age 20 years has been observed to influence the risk of several inflammatory conditions, possibly through underlying immunological mechanisms. Inflammation has further been suggested to be involved in prostate cancer development. We therefore hypothesized that immunological characteristics signaled by appendicitis before late adolescence might influence the risk of later prostate cancer, and aimed to evaluate this association in a population-based study.

**Methods:** We identified a large cohort of Swedish men who underwent assessment for military conscription around the age of 18 years (n= 242,573). Medical diagnoses at time of conscription were available through the Swedish Military Conscription Register. The Swedish Cancer Register was used to identify diagnoses of prostate cancer. Multivariable adjusted Cox regression analyses were used to estimate hazard ratios (HR) and 95% confidence intervals (95% CI) for the association between appendicitis and prostate cancer.

**Results:** During a median of 36.7 years of follow-up, 1,684 diagnoses of prostate cancer occurred. We found a statistically significant association between appendicitis and overall prostate cancer (adjusted HR: 1.70; 95% CI: 1.08-2.67). The risk was notably increased for advanced (HR: 4.42; 95% CI: 1.74-11.22) and lethal (HR: 8.95; 95% CI: 2.98-26.91) prostate cancer.

**Conclusion:** These results suggest that a diagnosis of appendicitis before adulthood potentially signals underlying immune characteristics and a pattern of inflammatory response relevant to prostate cancer risk. **Impact:** The study lends support to the proposed role of inflammation in prostate carcinogenesis, and adds another area of investigation potentially relevant to prostate cancer development.

## IBS

Gastroenterology. 2018 Apr 12. pii: S0016-5085(18)30445-1. doi: 10.1053/j.gastro.2018.04.012.

**Risk of Serious and Opportunistic Infections Associated With Treatment of Inflammatory Bowel Diseases.**

Kirchgesner J<sup>1</sup>, Lemaitre M<sup>2</sup>, Carrat F<sup>3</sup>, Zureik M<sup>2</sup>, Carbonnel MF<sup>4</sup>, Dray-Spira R<sup>5</sup>.

*BACKGROUND & AIMS:*

The risk of infection associated with tumor necrosis factor antagonists (anti-TNF) and thiopurines (combination therapy) is uncertain. We assessed the risk of serious and opportunistic infections in patients with IBD treated with thiopurine monotherapy, anti-TNF monotherapy, or combination therapy in a large cohort of patients in France.

*METHODS:*

We performed a nationwide population-based study of patients (18 years or older) with a diagnosis of IBD in the French national health insurance database; we collected data from January 1, 2009 until December 31, 2014. The risks of serious and opportunistic infections associated with exposure to combination therapy, anti-TNF, and thiopurine monotherapies were compared using marginal structural Cox proportional hazard models adjusted for baseline and time-varying socio-demographic characteristics, medications, and comorbidities.

*RESULTS:*

Among the 190,694 patients with IBD included in our analysis, 8561 serious infections and 674 opportunistic infections occurred. Compared to anti-TNF monotherapy, combination therapy was associated with increased risks of serious infection (hazard ratio [HR], 1.23; 95% CI, 1.05-1.45) and opportunistic infection (HR, 1.96; 95% CI, 1.32-2.91). Compared with thiopurine monotherapy, anti-TNF monotherapy was associated with increased risks of serious infection (HR, 1.71; 95% CI, 1.56-1.88), mycobacterial infection (HR, 1.98; 95% CI, 1.15-3.40) and bacterial infection (HR, 2.38; 95% CI, 1.23-4.58, respectively). Conversely, anti-TNF monotherapy was associated with decreased risk of opportunistic viral infection compared to thiopurine monotherapy (HR, 0.57, 95% CI, 0.38-0.87).

*CONCLUSIONS:*

In a nationwide cohort study of patients with IBD in France, we found heterogeneity in risks of serious and opportunistic infections in patients treated with immune-suppressive regimens. These should be carefully considered and weighed against potential benefits for IBD treatment in patient management.

## 12 A. WHIPLASH

### Brachial plexus

#### **Evidence for Increased MRI Signal Intensity and Morphological Changes in the Brachial Plexus and Median Nerves of Patients With Chronic Arm and Neck Pain Following Whiplash Injury**

**Authors:** Jane Greening, PhD MCSP<sup>1</sup>, Kamakshi Anantharaman, MSc<sup>2</sup>, Rupert Young, PhD<sup>2</sup>, Andrew Dilley, PhD<sup>1</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**0 **Issue:**0 **Pages:**1–35 **DOI:**10.2519/jospt.2018.7875

#### **Study Design**

Cross-sectional study.

#### **Background**

Whiplash following a motor vehicle accident can result in chronic neck and arm pain. Patients frequently present with cutaneous hypersensitivities and hypoesthesia but without obvious clinical sign of nerve injury. T2-weighted magnetic resonance imaging (MRI) has previously been used to identify nerve pathology.

#### **Objectives**

To determine whether there are signs of peripheral nerve pathology on MRI in patients with chronic arm and neck pain following whiplash injury.

#### **Methods**

This study used T2-weighted MRI to examine the brachial plexus and median nerve in patients and age-matched healthy control subjects. Clinical examination included tests of plexus and nerve trunk mechanical sensitivity.

#### **Results**

T2 signal was greater in the brachial plexus and median nerve at the wrist in the patient group (mean intensity ratio = 0.52 (0.13 SD) and 2.09 (0.33 SD) respectively) compared to the control group (mean intensity = 0.45 (0.07 SD) and 1.38 (0.31 SD) respectively;  $p < 0.05$ ). Changes in median nerve morphology were also observed, which included an enlargement (mean area = 8.05 (1.29 SD) mm<sup>2</sup> in the patient group and 6.52 (1.08 SD) mm<sup>2</sup> in the control group;  $p < 0.05$ ) and flattening at the proximal carpal row (mean aspect ratio = 2.46 (0.53 SD) in the patient group and 1.62 (0.30 SD) in the control group;  $p < 0.05$ ). All patients demonstrated signs of nerve trunk mechanical sensitivity.

#### **Conclusion**

These findings suggest that patients with chronic whiplash may have inflammatory changes and/or mild neuropathy, which may contribute to symptoms. *J Orthop Sports Phys Ther*, Epub 24 Apr 2018. doi:10.2519/jospt.2018.7875

### 13 B. TMJ/ORAL

#### Bruxism and psychotropic drugs

##### **Association between psychotropic medications and presence of sleep bruxism: A systematic review**

Journal of Oral Rehabilitation — | May 07, 2018

Melo G, et al.

Authors reviewed the literature for studies that assessed the relationship between psychotropic medication use and presence of sleep bruxism (SB). With use of citalopram, escitalopram, fluoxetine, mirtazapine and sertraline, no increased odds of SB were seen. Regarding anticonvulsants in children, only barbiturates were associated with SB, while for benzodiazepine, carbamazepine and valproate no increased odds for SB were observed. Methylphenidate was the only psychostimulant evaluated, and in adolescents, an association with SB was seen.

Results demonstrated a probable association of medications such as duloxetine, paroxetine, venlafaxine, barbiturates and methylphenidate with SB.



**13 C. AIRWAYS/SWALLOWING/SPEECH****CPAP and**

Sleep Breath. 2018 Apr 18. doi: 10.1007/s11325-018-1660-4.

**Impact of continuous positive airway pressure on vascular endothelial growth factor in patients with obstructive sleep apnea: a meta-analysis.**

Qi JC<sup>1</sup>, Zhang L<sup>1</sup>, Li H<sup>1</sup>, Zeng H<sup>1</sup>, Ye Y<sup>1</sup>, Wang T<sup>1</sup>, Wu Q<sup>1</sup>, Chen L<sup>1</sup>, Xu Q<sup>1</sup>, Zheng Y<sup>1</sup>, Huang Y<sup>1</sup>, Lin L<sup>2</sup>.

**PURPOSE:**

Cumulative evidence supports the clear relationship of obstructive sleep apnea (OSA) with cardiovascular disease (CVD). And, adherence to continuous positive airway pressure (CPAP) treatment alleviates the risk of CVD in subjects with OSA. Vascular endothelial growth factor (VEGF), a potent angiogenic cytokine regulated by hypoxia-inducible factor, stimulates the progression of CVD. Thus, whether treatment with CPAP can actually decrease VEGF in patients with OSA remains inconclusive. The purpose of the present study was to quantitatively evaluate the impact of CPAP therapy on VEGF levels in OSA patients.

**METHODS:**

We systematically searched Web of Science, Cochrane Library, PubMed, and Embase databases that examined the impact of CPAP on VEGF levels in OSA patients prior to May 1, 2017. Related searching terms were "sleep apnea, obstructive," "sleep disordered breathing," "continuous positive airway pressure," "positive airway pressure," and "vascular endothelial growth factor." We used standardized mean difference (SMD) to analyze the summary estimates for CPAP therapy.

**RESULTS:**

Six studies involving 392 patients were eligible for the meta-analysis. Meta-analysis of the pooled effect showed that levels of VEGF were significantly decreased in patients with OSA before and after CPAP treatment (SMD = - 0.440, 95% confidence interval (CI) = - 0.684 to - 0.196,  $z = 3.53$ ,  $p = 0.000$ ). Further, results demonstrated that differences in age, body mass index, apnea-hypopnea index, CPAP therapy duration, sample size, and racial differences also affected CPAP efficacy.

**CONCLUSIONS:**

Improved endothelial function measured by VEGF may be associated with CPAP therapy in OSA patients. The use of VEGF levels may be clinically important in evaluating CVD for OSA patients. Further large-scale, well-designed long-term interventional investigations are needed to clarify this issue.

**Infant sleep problems**

J Sleep Res. 2018 May 2:e12696. doi: 10.1111/jsr.12696.

**The effects of maternal risk factors during pregnancy on the onset of sleep difficulties in infants at 3 months old.**

Morales-Muñoz I<sup>1</sup>, Saarenpää-Heikkilä O<sup>2</sup>, Kylliäinen A<sup>3</sup>, Pölkki P<sup>4</sup>, Porkka-Heiskanen T<sup>5</sup>, Paunio T<sup>1,6</sup>, Paavonen EJ<sup>1,7</sup>.

Sleep problems in young children are among the most common concerns reported to paediatricians. Sleep is thought to have important regulatory functions, and sleep difficulties in early childhood are linked to several psychosocial and physiological problems. Moreover, several prenatal factors have been found to influence infants' sleep. Among them, most of the studies have been focused on maternal prenatal depression and/or anxiety as potential risk factors for sleep problems in childhood, whereas other relevant psychological factors during pregnancy have not received as much attention.

Therefore, we aimed to examine the effect of several psychiatric maternal risk factors during pregnancy (i.e. symptoms of anxiety, depression, insomnia, alcohol use, seasonality, attention deficit and hyperactivity disorder and/or stressful life events) on the onset of some sleep problems related to sleep quality and sleep practices in 3-month-old infants.

We examined 1,221 cases from a population-based birth cohort, with subjective measures during pregnancy in mothers, and at 3 months after birth in the infants. The findings showed that all the maternal risk factors during pregnancy, except for symptoms of alcoholism and sleepiness, were related to sleep difficulties in infants. Interestingly, attention deficit and hyperactivity disorder symptomatology in mothers during pregnancy was the only variable that predicted more than two sleeping difficulties (i.e. long sleep-onset latency, co-sleeping with parents and irregular sleeping routines) at 3 months old.

Our results highlight the relevance of maternal risk factors during pregnancy, and not only prenatal depression and/or anxiety, as variables to be considered when examining sleep difficulties in infants.

## Sleep apnea and the liver

**ABSTRACT FINAL ID:** 1229 The Journal of Pediatrics

**TITLE: Treating Obstructive Sleep Apnea and Chronic Intermittent Nocturnal Hypoxia with CPAP Improves Severity of Non-Alcoholic Fatty Liver Disease (NAFLD) in Obese Pediatric Patients**

**ABSTRACT**

Emerging evidence suggests that obesity related obstructive sleep apnea (OSA) and chronic intermittent nocturnal hypoxia are associated with oxidative stress and progression of pediatric NAFLD.

**Objective:** To determine the effects of treating OSA/chronic intermittent nocturnal hypoxia on oxidative stress and pediatric NAFLD disease severity.

**Methods:** Biopsy proven NAFLD subjects with OSA/nocturnal hypoxia were studied before and after CPAP treatment for sleep disordered breathing, including laboratory testing and markers of oxidative stress (urine F2-isoprostanes (F2I)) and hypoxia (circulating HIF, VEGF and EPO).

**Results:** 9 adolescents (age  $11.8 \pm 1.3$  yrs, BMI  $29.5 \pm 3.8$ , 89% male, 100% Hispanic) with non-alcoholic steatohepatitis (NASH) (mean histologic mean grade:  $2.3 \pm 0.9$ , stage:  $1.4 \pm 1.3$  and NAS summary score:  $4.8 \pm 1.6$ ) had OSA/nocturnal hypoxia by polysomnogram. At baseline, they had severe sleep disordered breathing, elevated aminotransferases, and the metabolic syndrome (Table). They experienced significant oxidative stress (high F2I) and systemic hypoxia (high circulating HIF, VEGF, and EPO). OSA/hypoxia was treated with home CPAP for a mean  $89 \pm 62$  days, with a mean usage of  $296 \pm 126$  minutes per night and subjects were reevaluated. While BMI was unchanged ( $31.7 \pm 2.8$ ), OSA/nocturnal hypoxia severity improved significantly on CPAP (Table). Significant decreases in ALT, metabolic syndrome markers, oxidative stress (F2I) and VEGF were observed.

**Conclusions:** This study provides strong evidence that treatment of OSA/chronic intermittent hypoxia with CPAP in children with NAFLD improves liver injury and components of metabolic syndrome and reduces oxidative stress. Therefore, CPAP should be formally tested as a novel therapy to prevent progression of NAFLD in those obese children found to have OSA/chronic intermittent nocturnal hypoxia.

**Sleep and atherosclerosis**

## Atherosclerosis

**Sleep duration and subclinical atherosclerosis: The Aragon Workers' Health Study**

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<https://doi.org/10.1016/j.atherosclerosis.2018.05.003>

**Highlights**

- Duration and quality of sleep play a key role in good health and quality of life.
- Few studies have evaluated the association of sleep duration with atherosclerosis.
- Compared to sleeping 7 h/day, shorter and longer sleep duration was associated with a higher prevalence of coronary calcium.
- The association between sleep duration and carotid or femoral plaques was not statistically significant.
- These findings support that subjects with short or long sleep are at increased risk of CVD.

**Background and aims**

Few studies have evaluated the association of sleep duration with subclinical atherosclerosis, and with heterogeneous findings. We evaluated the association of sleep duration with the presence of coronary, carotid, and femoral subclinical atherosclerosis in healthy middle-age men with low prevalence of clinical comorbidities.

**Methods**

We performed a cross-sectional analysis of 1968 men, 40–60 years of age, participating in the Aragon Workers' Health Study (AWHS). Duration of sleep during a typical work week was assessed by questionnaire. Coronary artery calcium scores (CACS) was assessed by computed tomography and the presence of carotid plaque and femoral plaque by ultrasound.

**Results**

In fully adjusted models, the odds ratios (95% CI) for CACS >0 comparing sleep durations of ≤5, 6, and ≥8 h with 7 h were 1.34 (0.98–1.85), 1.35 (1.08–1.69) and 1.21 (0.90–1.62), respectively ( $p = 0.04$ ). A similar U-shaped association was observed for CACS ≥100 and for CACS. The corresponding odds ratios for the presence of at least one carotid plaque were ≤5, 6, and ≥8 h with 7 h were 1.23 (0.88–1.72), 1.09 (0.86–1.38), and 0.86 (0.63–1.17), respectively ( $p = 0.31$ ), and for the presence of at least one femoral plaque were 1.25 (0.87–1.80), 1.19 (0.93–1.51) and 1.17 (0.86–1.61), respectively ( $p = 0.39$ ).

**Conclusions**

Middle-aged men reporting 7 h of sleep duration had the lowest prevalence of subclinical coronary atherosclerosis as assessed by CAC. Our results support that men with very short or very long sleep durations are at increased risk of atherosclerosis.

## 16. CONCUSSIONS

More LE injuries following concussions

### Risk for Lower Extremity Injury After Concussion: A Matched Cohort Study in Soldiers

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**0 **Issue:**0 **Pages:**1–25 **DOI:**10.2519/jospt.2018.8053

#### Study Design

Matched cohort study.

#### Background

Rates of lower extremity (LE) musculoskeletal injury are reportedly higher in professional and collegiate athletes following concussions. However, there is a paucity of evidence on this relationship outside of high level athletes.

#### Objectives

Examine the risk of acute LE musculoskeletal injury in Soldiers within 2 years of an incident concussion compared to matched non-concussed Soldiers.

#### Methods

This study used the medical encounter and personnel data of active duty U.S. Army Soldiers from 2005-2011. Incident concussions were identified using International Classification of Disease 9th Revision (ICD-9) codes in medical encounter data of all Soldiers from 2005-2009. One non-concussed Soldier in the Army during the same month was matched on age, sex, rank, length of service, deployment status, and military career field to each concussed Soldier. A hazard ratio (HR) and 95% confidence interval (95%CI) was calculated for the risk of LE injury within 2 years of an incident concussion. Monthly HRs were compared to identify differences in injury rates between the groups, and a HR for the period of greatest difference was also calculated.

#### Results

N=23,044 individuals (11,522 concussed and 11,522 non-concussed) were included in this study. Within 2 years of concussion, the hazard of LE injury was 38% greater compared to non-concussed Soldiers (HR=1.38, 95%CI[1.30,1.46]), while the 15-month hazard was 45% greater (HR=1.45, 95%CI[1.36,1.56]).

#### Conclusions

The rate of LE musculoskeletal injury among this population of physically active adults is higher following concussion, and the risk remains elevated for more than a year following injury.

#### Level of Evidence

2b. *J Orthop Sports Phys Ther*, Epub 8 May 2018. doi:10.2519/jospt.2018.8053

## Veterans and dementia

**Original Investigation** May 7, 2018

**Association of Mild Traumatic Brain Injury With and Without Loss of Consciousness With Dementia in US Military Veterans**

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**Key Points**

**Question** Is mild traumatic brain injury without loss of consciousness associated with an increased risk of dementia diagnosis in veterans?

**Findings** In this propensity-matched cohort study of more than 350 000 veterans with and without traumatic brain injuries, mild traumatic brain injury without loss of consciousness was associated with more than a 2-fold increase in the risk of dementia diagnosis, even after adjusting for medical and psychiatric comorbidities.

**Meaning** Even mild traumatic brain injuries that do not result in loss of consciousness might have long-term neurodegenerative consequences.

**Importance** Traumatic brain injury (TBI) is common in both veteran and civilian populations. Prior studies have linked moderate and severe TBI with increased dementia risk, but the association between dementia and mild TBI, particularly mild TBI without loss of consciousness (LOC), remains unclear.

**Objective** To examine the association between TBI severity, LOC, and dementia diagnosis in veterans.

**Design, Setting, and Participants** This cohort study of all patients diagnosed with a TBI in the Veterans Health Administration health care system from October 1, 2001, to September 30, 2014, and a propensity-matched comparison group. Patients with dementia at baseline were excluded. Researchers identified TBIs through the Comprehensive TBI Evaluation database, which is restricted to Iraq and Afghanistan veterans, and the National Patient Care Database, which includes veterans of all eras. The severity of each TBI was based on the most severe injury recorded and classified as mild without LOC, mild with LOC, mild with LOC status unknown, or moderate or severe using Department of Defense or Defense and Veterans Brain Injury Center criteria. *International Classification of Diseases, Ninth Revision* codes were used to identify dementia diagnoses during follow-up and medical and psychiatric comorbidities in the 2 years prior to the index date.

**Main Outcomes and Measures** Dementia diagnosis in veterans who had experienced TBI with or without LOC and control participants without TBI exposure.

**Results** The study included 178 779 patients diagnosed with a TBI in the Veterans Health Administration health care system and 178 779 patients in a propensity-matched comparison group. Veterans had a mean (SD) age of nearly 49.5 (18.2) years at baseline; 33 250 (9.3%) were women, and 259 136 (72.5%) were non-Hispanic white individuals. Differences between veterans with and without TBI were small. A total of 4698 veterans (2.6%) without TBI developed dementia compared with 10 835 (6.1%) of those with TBI. After adjustment for demographics and medical and psychiatric comorbidities, adjusted hazard ratios for dementia were 2.36 (95% CI, 2.10-2.66) for mild TBI without LOC, 2.51 (95% CI, 2.29-2.76) for mild TBI with LOC, 3.19 (95% CI, 3.05-3.33) for mild TBI with LOC status unknown, and 3.77 (95% CI, 3.63-3.91) for moderate to severe TBI.

**Conclusions and Relevance** In this cohort study of more than 350 000 veterans, even mild TBI without LOC was associated with more than a 2-fold increase in the risk of dementia diagnosis. Studies of strategies to determine mechanisms, prevention, and treatment of TBI-related dementia in veterans are urgently needed.

## 23. SURGERY

Pt important in replacements

### The Utilization of Formal Physical Therapy After Shoulder Arthroplasty

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,

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**Study Design** Epidemiological retrospective database study.

**Background** It is widely believed that structured rehabilitation programs by professional therapists help guide patients through the various recovery periods after shoulder arthroplasty, speeding up their recovery and improving their final functional gains. However, to our knowledge, there are no studies providing information about the current state of physical rehabilitation use after shoulder arthroplasty.

#### Objectives

Describe the variation in physical rehabilitation utilization after total and reverse total shoulder arthroplasty and identify differences in utilization based on type of insurance (private versus public), gender, age, region of the country, and type of replacement.

#### Methods

This study utilizes a commercially available database, PearlDiver, with longitudinal patient tracking linking all patients' CPT (Current Procedural Terminology) and ICD-9 (International Classification of Diseases, Ninth Revision) codes to their specific records to analyze patterns of physical rehabilitation usage after total and reverse total shoulder arthroplasty (TSA and RSA) in the US. Two main patient populations were analyzed within the PearlDiver database, the Humana private insurance population and the Medicare insurance population. The period analyzed was 2010-2015.

#### Results

There was significantly higher utilization of physical rehabilitation in the Humana population when compared to the Medicare population ( $p < .001$ , Cramer's  $V = .270$ ). In the Humana population 36% patients have 5 or less physical therapy visits in the six months following their operation, while in the Medicare population 56% of patients have 5 or less physical rehabilitation visits in the same period. TSA had a higher utilization rate than RSA in the Humana ( $p < .001$ ,  $V = .104$ ; TSA: 31% 5 or less physical rehabilitation visits, RSA: 40% 5 or less PT visits within 6 months) and Medicare populations ( $p < .001$ ,  $V = .135$ ; TSA 51% 5 or less PT visits, RSA: 61% 5 or less physical rehabilitation visits within 6 months).

#### Conclusion

Postoperative utilization of physical rehabilitation after anatomic and reverse total shoulder arthroplasty is markedly higher in privately insured patients than patients with Medicare, regardless of age, gender, diagnosis, or region of country. These findings have important implications from the individual patient's experience and outcomes to the system-wide resource utilization.

**Level of Evidence** Level III epidemiological study. *J Orthop Sports Phys Ther*, Epub 8 May 2018. doi:10.2519/jospt.2018.8176

### 30 A. IMPINGEMENT

#### Difference between in soccer players

#### Sub-Elite Football Players With Hip-Related Groin Pain and Positive Flexion Adduction Internal Rotation Test Exhibit Distinct Biomechanical Differences Compared With the Asymptomatic Side

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2018 **Volume:**0 **Issue:**0 **Pages:**1–26 **DOI:**10.2519/jospt.2018.7910

#### Study Design

Observational cross-sectional study.

#### Background

Hip-related groin pain is common in sub-elite football players and may be associated with altered hip biomechanics.

#### Objectives

To compare the hip biomechanics, bony hip morphology associated with femoroacetabular impingement (FAI) syndrome, and hip strength and range of motion between the symptomatic and asymptomatic limb of sub-elite football players with unilateral hip-related groin pain and a positive flexion adduction internal rotation test.

#### Methods

Fifteen sub-elite football (soccer) players with unilateral hip-related groin pain and a positive flexion adduction internal rotation test were recruited. Three-dimensional motion analysis and ground reaction force data were recorded for walking and a single leg drop jump (SLDJ) task. Participants also underwent a standard anterior-posterior hip radiograph and hip strength and range of movement assessment. Between-limb differences were assessed using paired t-tests or Wilcoxon sign-rank tests.

#### Results

The symptomatic limb displayed a smaller peak hip extension angle ( $P=.01$ ) and a lower peak hip adduction moment ( $P=.03$ ) compared with the asymptomatic limb during the stance phase of walking. Additionally, during the SLDJ, the symptomatic limb demonstrated less total sagittal plane range of motion ( $P=.04$ ). The symptomatic limb also demonstrated less external rotation range of motion ( $P=.03$ ) however, no differences were found between limbs for bony hip morphology associated with FAI syndrome or hip strength.

#### Conclusion

This study found between limb asymmetries in low- and high-impact functional tasks such as walking and a SLDJ in football players with unilateral hip-related groin pain. Despite unilateral pain, bony morphology associated with FAI syndrome did not differ between limbs. *J Orthop Sports Phys Ther*, Epub 8 May 2018. doi:10.2519/jospt.2018.7910



**32 A. KNEE/ACL****Laxity**

Arthroscopy: The Journal of Arthroscopic & Related Surgery

**Risk Factors for Abnormal Anteroposterior Knee Laxity After Primary Anterior Cruciate Ligament Reconstruction**

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<https://doi.org/10.1016/j.arthro.2018.03.038>

**Purpose**

To identify preoperative and intraoperative factors associated with abnormal anterior knee laxity after primary anterior cruciate ligament (ACL) reconstruction.

**Methods**

A total of 5,462 patients who underwent primary ACL reconstruction at our institution from January 2000 to October 2015, with no associated ligament injuries, were included. Demographic data, information regarding graft used, concomitant meniscal surgery, and instrumented laxity were reviewed. The KT-1000 arthrometer, with an anterior tibial load of 134 N, was used to evaluate knee laxity preoperatively and at 6-month follow-up. Patients were considered to have abnormal anterior knee laxity if the postoperative side-to-side difference was greater than 5 mm (International Knee Documentation Committee laxity grade C or D). A logistic regression analysis was used to evaluate whether patient age, gender, preoperative knee laxity, graft type, and presence of medial or lateral meniscus resection or suture were risk factors for abnormal knee laxity.

**Results**

The risk of having abnormal anterior knee laxity was significantly related to younger age (<30 years) (odds ratio [OR] 1.44; 95% confidence interval [CI], 1.07-1.95;  $P = .016$ ), preoperative side-to-side difference greater than 5 mm (OR, 6.57; 95% CI, 4.94-8.73;  $P < .001$ ), hamstring tendon graft (OR, 1.83; 95% CI, 1.08-3.11;  $P = .025$ ), and medial meniscus resection (OR, 2.22; 95% CI, 1.61-3.07;  $P < .001$ ). Female gender (OR, 0.96; 95% CI, 0.72-1.28;  $P = .80$ ), medial meniscus suture (OR, 0.82; 95% CI 0.42-1.62;  $P = .58$ ), lateral meniscus resection (OR, 0.73; 95% CI 0.49-1.10;  $P = .13$ ), and lateral meniscus suture (OR, 0.99; 95% CI, 0.46-2.11;  $P = .98$ ) were not associated with increased risk of abnormal knee laxity.

**Conclusions**

Age less than 30 years, preoperative side-to-side difference greater than 5 mm, hamstring tendon graft, and medial meniscus resection are associated with increased risk of having abnormal anterior knee laxity 6 months after primary ACL reconstruction.

**37. OSTEOARTHRITIS/KNEE****Running does not increase****Running does not increase symptoms or structural progression in people with knee osteoarthritis: Data from the osteoarthritis initiative**

Clinical Rheumatology — | May 08, 2018

Lo GH, et al.

Researchers assessed the relationship of self-selected running on osteoarthritis (OA) symptoms and structure progression in people with knee OA. In individuals 50 years old and older with knee OA, an association of self-selected running was seen with improved knee pain, and not with worsening knee pain or radiographically defined structural progression was seen. Self-selected running, which was likely influenced by knee symptoms and could result in lower intensity and shorter duration sessions of exercise, need not be discouraged in people with knee OA.

## Methods

- In this nested cohort study within the Osteoarthritis Initiative (OAI) (2004–2014) authors included those at least 50 years old with OA in at least 1 knee.
- They defined the runners via a self-administered questionnaire at the 96-month visit.
- Experts evaluated symptoms and scored radiographs for Kellgren-Lawrence (KL) grade (2–4) and medial Joint Space Narrowing (JSN) score (0–3) at baseline and 48-months.
- The association between self-selected running with KL worsening, medial JSN worsening, new knee pain, and improved knee pain over 48 months, was evaluated, adjusting for baseline age, sex, body mass index (BMI), KL score, contralateral KL score, contralateral knee pain, and injury.
- In the case of unavailability of data at the 48-month visit, data from the 36-month visit was used.

## Results

- As per data, 1,203 participants had a mean age of 63.2 (7.9) years, BMI of 29.5 (4.6) kg/m<sup>2</sup>, 45.3% were male, and 11.5% were runners.
- Data from 8% of participants needed imputation.
- Authors noted that adjusted odds ratios for KL grade worsening and new frequent knee pain were 0.9 (0.6-1.3) and 0.9 (0.6-1.6) respectively.
- For frequent knee pain resolution, adjusted odds ratio was 1.7 (1.0-2.8).

## 52. EXERCISE

## Resisted ex help depression

**Association of Efficacy of Resistance Exercise Training With Depressive Symptoms Meta-analysis and Meta-regression Analysis of Randomized Clinical Trials**

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## Key Points

**Question** What is the overall association of efficacy of resistance exercise training with depressive symptoms, and which logical, theoretical, and/or prior empirical variables are associated with depressive symptoms? **Findings** In this meta-analysis of 33 clinical trials including 1877 participants, resistance exercise training was associated with a significant reduction in depressive symptoms, with a moderate-sized mean effect. Total volume of resistance exercise training, health status, and strength improvements were not associated with the antidepressant effect; however, smaller reductions in depressive symptoms were derived from trials with blinded allocation and/or assessment. **Meaning** The available empirical evidence supports resistance exercise training as an alternative and/or adjuvant therapy for depressive symptoms. **Importance** The physical benefits of resistance exercise training (RET) are well documented, but less is known regarding the association of RET with mental health outcomes. To date, no quantitative synthesis of the antidepressant effects of RET has been conducted. **Objectives** To estimate the association of efficacy of RET with depressive symptoms and determine the extent to which logical, theoretical, and/or prior empirical variables are associated with depressive symptoms and whether the association of efficacy of RET with depressive symptoms accounts for variability in the overall effect size. **Data Sources** Articles published before August 2017, located using Google Scholar, MEDLINE, PsycINFO, PubMed, and Web of Science. **Study Selection** Randomized clinical trials included randomization to RET (n = 947) or a nonactive control condition (n = 930). **Data Extraction and Synthesis** Hedges *d* effect sizes were computed and random-effects models were used for all analyses. Meta-regression was conducted to quantify the potential moderating influence of participant and trial characteristics. **Main Outcomes and Measures** Randomized clinical trials used validated measures of depressive symptoms assessed at baseline and midintervention and/or postintervention. Four primary moderators were selected a priori to provide focused research hypotheses about variation in effect size: total volume of prescribed RET, whether participants were healthy or physically or mentally ill, whether or not allocation and/or assessment were blinded, and whether or not the RET intervention resulted in a significant improvement in strength. **Results** Fifty-four effects were derived from 33 randomized clinical trials involving 1877 participants. Resistance exercise training was associated with a significant reduction in depressive symptoms with a moderate-sized mean effect  $\Delta$  of 0.66 (95% CI, 0.48-0.83;  $z = 7.35$ ;  $P < .001$ ). Significant heterogeneity was indicated (total  $Q = 216.92$ ,  $df = 53$ ;  $P < .001$ ;  $I^2 = 76.0\%$  [95% CI, 72.7%-79.0%]), and sampling error accounted for 32.9% of observed variance. The number needed to treat was 4. Total volume of prescribed RET, participant health status, and strength improvements were not significantly associated with the antidepressant effect of RET. However, smaller reductions in depressive symptoms were derived from randomized clinical trials with blinded allocation and/or assessment. **Conclusions and Relevance** Resistance exercise training significantly reduced depressive symptoms among adults regardless of health status, total prescribed volume of RET, or significant improvements in strength. Better-quality randomized clinical trials blinding both allocation and assessment and comparing RET with other empirically supported treatments for depressive symptoms are needed.

**56. ATHLETICS****Cross country VO<sub>2</sub>****Seasonal variations in body composition, maximal oxygen uptake, and gas exchange threshold in cross-country skiers**

Open Access Journal of Sports Medicine — | May 14, 2018

Polat M, et al.

Researchers determined the differences in body composition, maximal oxygen uptake ( $VO_{2max}$ ), and gas exchange threshold values of cross-country skiers across training phases throughout a season. They obtained first measurements in July, during the first preparation period; the second measurements in October, during the second preparation period; and the third measurements in February, during the competition period. No significant change was observed in  $VO_{2max}$  and gas exchange threshold values recorded during the third measurements, the timing of which coincided with the competitive season of the cross-country skiers. However, a significant increase was noted in their incremental running test time and running speed while a notable decrease was seen in their body weight and body mass index. A tolerance for high-intensity exercise was developed in the cross-country skiers and they reached their highest level of athletic performance during the competitive season.\

**59. PAIN****SCI neuropathic pain**

The Journal of Pain

Original Reports

**Electroencephalographic Predictors of Neuropathic Pain in Subacute Spinal Cord Injury**

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Helen Berry<sup>d,</sup> Matthew Fraser<sup>c</sup>

<https://doi.org/10.1016/j.jpain.2018.04.011>

**Highlights**

- neuropathic pain (NP) in SCI has both EEG predictors and early markers
- Reduced EEG reactivity to eyes opening and reduced alpha power predict NP in SCI
- EEG predictors may predict NP earlier than sensory tests

**Abstract**

It is widely believed that cortical changes are a consequence of long standing neuropathic pain (NP). In this paper we demonstrate that NP in people with subacute spinal cord injury (SCI) has characteristic electroencephalographic (EEG) markers which precede the onset of pain. EEG was recorded in a relaxed state and during motor imagination tasks in 10 able bodied participants and 31 subacute SCI participants (11 with NP, 10 without NP and 10 who developed pain within 6 months of EEG recording). All 20 SCI participants initially without NP were tested for mechanically induced allodynia but only one person, who later developed pain, reported an unpleasant sensation. The EEG reactivity to opening eyes was reduced in the alpha band and absent in the theta and beta bands in participants who later developed pain, and it was reduced in participants who already had pain. Alpha band power was reduced at BA7 in both the relaxed state and during motor imagination in participants who either had or later developed pain compared to participants without pain. All SCI groups had reduced dominant alpha frequency and beta band power at BA7.

Electroencephalographic reactivity to eyes opening, and reduced spontaneous and induced alpha activity over the parietal cortex were predictors of future NP as well as markers of existing NP.

Clinical Trial Registration Number: NCT02178917

Perspectives: We demonstrate that brain activity in subacute SCI contains both early markers and predictors of NP, which may manifest before sensory discomfort. These markers and predictors may complement known sensory phenotypes of NP. They may exist in other patient groups suffering from NP of central origin.

## Depression

**Association between psychological interventions and chronic pain outcomes in older adults: A systematic review and meta-analysis**

JAMA Internal Medicine — | May 10, 2018

Niknejad B, et al.

The efficacy of psychological interventions in older adults with chronic pain was investigated. In addition, researchers determined if treatment effects vary by participant, intervention, and study characteristics. In older adults, psychological interventions for the treatment of chronic pain showed small benefits, including reducing pain and catastrophizing beliefs and improving pain self-efficacy for managing pain. When delivered using group-based approaches, these results were strongest.

## Methods

- A search of MEDLINE, Embase, PsycINFO, and the Cochrane Library from inception to March 29, 2017 was performed for the data.
- For analysis, included studies were those which
  - (1) Used a randomized trial design,
  - (2) Evaluated a psychological intervention that used cognitive behavioral modalities alone or in combination with another strategy,
  - (3) Enrolled individuals with chronic pain (pain  $\geq 3$  months) with a sample mean age of 60 years or older, and
  - (4) Reported preintervention and postintervention quantitative data.
- Data was independently extracted by 2 authors.
- The effects of treatment on outcomes was assessed via a mixed-model meta-analysis.
- The association between participant (eg, age), intervention (eg, treatment mode delivery), and study (eg, methodologic quality) characteristics with outcomes was investigated via performing analyses.
- The primary outcome included pain intensity.
- Secondary outcomes included pain interference, depressive symptoms, anxiety, catastrophizing beliefs, self-efficacy for managing pain, physical function, and physical health.

## Results

- Analysis of 22 studies with 2,608 participants (1,799 [69.0%] women) was performed.
- Mean (SD) age of the participants was 71.9 (7.1) years.
- In this study, differences of standardized mean differences ( $d_D$ ) at posttreatment were pain intensity ( $d_D = -0.181$ ,  $P = .006$ ), pain interference ( $d_D = -0.133$ ,  $P = .12$ ), depressive symptoms ( $d_D = -0.128$ ,  $P = .14$ ), anxiety ( $d_D = -0.205$ ,  $P = .09$ ), catastrophizing beliefs ( $d_D = -0.184$ ,  $P = .046$ ), self-efficacy ( $d_D = 0.193$ ,  $P = .02$ ), physical function ( $d_D = 0.006$ ,  $P = .96$ ), and physical health ( $d_D = 0.160$ ,  $P = .24$ ).
- Observation suggested persistence of effects beyond the posttreatment assessment only for pain ( $d_D = -0.251$ ,  $P = .002$ ).
- Moderator analyses revealed that only mode of therapy (group vs individual) had a consistent effect in favor of group-based therapy.

**Unifying proposal**

J Neurol Neurosurg Psychiatry. 2018 May 7. pii: jnnp-2017-317823. doi: 10.1136/jnnp-2017-317823.

**A unifying theory for cognitive abnormalities in functional neurological disorders, fibromyalgia and chronic fatigue syndrome: systematic review.**

Teodoro T<sup>1,2,3</sup>, Edwards MJ<sup>1,2</sup>, Isaacs JD<sup>1,2</sup>.

**BACKGROUND:**

Functional cognitive disorder (FCD) describes cognitive dysfunction in the absence of an organic cause. It is increasingly prevalent in healthcare settings yet its key neuropsychological features have not been reported in large patient cohorts. We hypothesised that cognitive profiles in fibromyalgia (FM), chronic fatigue syndrome (CFS) and functional neurological disorders (FNDs) would provide a template for characterising FCD.

**METHODS:**

We conducted a systematic review of studies with cognition-related outcomes in FM, CFS and FND.

**RESULTS:**

We selected 52 studies on FM, 95 on CFS and 39 on FND. We found a general discordance between high rates of subjective cognitive symptoms, including forgetfulness, distractibility and word-finding difficulties, and inconsistent objective neuropsychological deficits. Objective deficits were reported, including poor selective and divided attention, slow information processing and vulnerability to distraction. In some studies, cognitive performance was inversely correlated with pain, exertion and fatigue. Performance validity testing demonstrated poor effort in only a minority of subjects, and patients with CFS showed a heightened perception of effort.

**DISCUSSION:**

The cognitive profiles of FM, CFS and non-cognitive FND are similar to the proposed features of FCD, suggesting common mechanistic underpinnings. Similar findings have been reported in patients with mild traumatic brain injury and whiplash. We hypothesise that pain, fatigue and excessive interoceptive monitoring produce a decrease in externally directed attention. This increases susceptibility to distraction and slows information processing, interfering with cognitive function, in particular multitasking. Routine cognitive processes are experienced as unduly effortful. This may reflect a switch from an automatic to a less efficient controlled or explicit cognitive mode, a mechanism that has also been proposed for impaired motor control in FND. These experiences might then be overinterpreted due to memory perfectionism and heightened self-monitoring of cognitive performance.