

## 2. LBP

### Pain Interference

The Journal of Pain

#### Prevalence and Correlates of Low Pain Interference among Patients with High Pain Intensity who are Prescribed Long-Term Opioid Therapy

- Melissa H. Adams<sup>a</sup>, Steven K. Dobscha<sup>a,b</sup>, Ning X. Smith<sup>c</sup>, Bobbi Jo Yarborough<sup>c</sup>, Richard A. Deyo<sup>c,d</sup>, Benjamin J. Morasco<sup>a,b</sup>,  
<https://doi.org/10.1016/j.jpain.2018.04.005>

#### Highlights

- We assessed pain interference among patients with high pain intensity.
- Those with lower pain interference had fewer mental health symptoms.
- Depressive symptoms and pain self-efficacy were associated with pain interference.
- Interventions targeting pain self-efficacy and depression are recommended.

#### Abstract

The pain experience may vary greatly among individuals reporting equally high levels of pain. We sought to examine demographic and clinical characteristics associated with pain interference in patients with high pain intensity. Among patients with chronic musculoskeletal pain who were prescribed long-term opioid therapy (LTOT), who were recruited from two healthcare systems, we identified a subset who reported high pain intensity (n=189). All individuals completed self-report assessments of clinical and demographic factors. Analyses examined characteristics associated with pain interference. Within this group of patients with high reported pain intensity, 16.4% (n=31) had low pain interference, 39.2% (n=74) had moderate pain interference, and 44.4% (n=84) had high pain interference. In bivariate analyses, patients with lower pain interference had fewer symptoms of depression and anxiety, less pain catastrophizing, better quality of life, and greater self-efficacy for managing pain. In multivariate analyses, variables most strongly associated with low pain interference, relative to high interference, were depression severity (OR=0.90, 95% CI=0.82-0.99) and pain self-efficacy (OR=1.07, 95% CI=1.02-1.12). Study results suggest that chronic pain treatments that address symptoms of depression and enhance pain self-efficacy may be prioritized, particularly among patients who are prescribed long-term opioid therapy.

Perspective: This article describes the prevalence and correlates of pain interference categories (low, medium, and high) among patients with high pain intensity who are prescribed long-term opioid therapy. Findings reveal that 16.4% of participants with high pain intensity had low impairment. Multivariate analyses indicate variables significantly associated with low pain interference were lower depression scores and higher pain self-efficacy.

**What aggravates acute LBP**

Spine (Phila Pa 1976). 2018 Mar 15;43(6):427-433. doi: 10.1097/BRS.0000000000002326.

**Do Physical Activities Trigger Flare-ups During an Acute Low Back Pain Episode?: A Longitudinal Case-Crossover Feasibility Study.**

Suri P<sup>1,2,3,4</sup>, Rainville J<sup>3,4</sup>, de Schepper E<sup>5</sup>, Martha J<sup>3</sup>, Hartigan C<sup>3,4</sup>, Hunter DJ<sup>3,6</sup>.

*STUDY DESIGN:*

Prospective, longitudinal case-crossover study.

*OBJECTIVE:*

The aim of this study was to determine whether physical activities trigger flare-ups of pain during the course of acute low back pain (LBP).

*SUMMARY OF BACKGROUND DATA:*

∴ There exist no evidence-based estimates for the transient risk of pain flare-ups associated with specific physical activities, during acute LBP.

*METHODS:*

Participants with LBP of duration <3 months completed frequent, Internet-based serial assessments at both 3- and 7-day intervals for 6 weeks. At each assessment, participants reported whether they had engaged in specific physical activity exposures, or experienced stress or depression, during the past 24 hours. Participants also reported whether they were currently experiencing a LBP flare-up, defined as "a period of increased pain lasting at least 2 hours, when your pain intensity is distinctly worse than it has been recently." Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated for associations between potential triggers during the past 24 hours, and the risk of LBP flare-ups, using conditional logistic regression.

*RESULTS:*

Of 48 participants followed longitudinally, 30 participants had both case ("flare") and control periods and contributed data to the case-crossover analysis. There were 81 flare periods and 247 control periods, an average of 11 periods per participant. Prolonged sitting (>6 hours) was the only activity that was significantly associated with flare-ups (OR 4.4, 95% CI 2.0-9.7; P<0.001). Having either stress or depression was also significantly associated with greater risk of flare-ups (OR 2.5, 95% CI 1.0-6.0; P=0.04). In multivariable analyses, prolonged sitting (OR 4.2, 95% CI 1.9-9.1; P<0.001), physical therapy (PT) (OR 0.4, 95% CI 0.1-1.0; P=0.05), and stress/depression (OR 2.8, 95% CI 1.2-6.7; P=0.02) were independently and significantly associated with LBP flare-up risk.

*CONCLUSION:*

Among participants with acute LBP, prolonged sitting (>6 hours) and stress or depression triggered LBP flare-ups. PT was a deterrent of flare-ups.

## 5. SURGERY

### Fusion comparisons

*Clin Spine Surg.* 2018 May;31(4):E230-E238. doi: 10.1097/BSD.0000000000000549.

#### **Radiographic and Clinical Outcomes of Anterior and Transforaminal Lumbar Interbody Fusions: A Systematic Review and Meta-analysis of Comparative Studies.**

Ajiboye RM<sup>1</sup>, Alas H<sup>2</sup>, Mosich GM<sup>1</sup>, Sharma A<sup>3</sup>, Pourtaheri S<sup>1</sup>.

#### *STUDY DESIGN:*

Systematic review and meta-analysis.

#### *OBJECTIVE:*

Compare the radiographic and clinical outcomes of anterior lumbar interbody fusion (ALIF) to transforaminal lumbar interbody fusion (TLIF).

#### *SUMMARY OF BACKGROUND DATA:*

ALIF and TLIF are 2 methods of achieving spinal arthrodesis. There are conflicting reports with no consensus on the optimal interbody technique to achieve successful radiographic and clinical outcomes. The goal of this systematic review and meta-analysis was to compare the radiographic and clinical outcomes of ALIF to TLIF.

#### *MATERIALS AND METHODS:*

A systematic search of multiple medical reference databases was conducted for studies comparing ALIF to TLIF. Studies that included stand-alone ALIFs were excluded. Meta-analysis was performed using the random-effects model for heterogeneity. Radiographic outcome measures included segmental and overall lumbar lordosis, and fusion rates. Clinical outcomes measures included Oswestry disability index (ODI) and visual analog scale (VAS) score for back pain.

#### *RESULTS:*

The search yielded 7 studies totaling 811 patients (ALIF=448, TLIF=363). ALIF was superior to TLIF in restoring segmental lumbar lordosis at L4-L5 and L5-S1 (L4-L5; P=0.013, L5-S1; P<0.001). ALIF was also superior to TLIF in restoring overall lumbar lordosis (P<0.001). However, no significant differences in fusion rates were noted between both techniques [odds ratio=0.905; 95% confidence interval, 0.458-1.789; P=0.775]. In addition, ALIF and TLIF were comparable with regards to ODI and VAS scores (ODI; P=0.184, VAS; P=0.983).

#### *CONCLUSIONS:*

For the restoration of lumbar lordosis, ALIF is superior to TLIF. However, TLIF is comparable to ALIF with regards to fusion rate and clinical outcomes.

### 7. PELVIC ORGANS/WOMAN'S HEALTH

#### Diet and Menopause

**Dietary intake and age at natural menopause: Results from the UK Women's Cohort Study**  
Journal of Epidemiology and Community Health — | May 04, 2018  
Dunneram Y, et al.

Using regression modelling and adjusting for confounders, researchers examined the links between diet and age at natural menopause among women aged 40–65 years from the UK Women's Cohort Study who had experienced a natural menopause between baseline and first follow-up.

The permanent cessation of menstrual periods for at least 12 consecutive months was accepted as the definition of natural menopause. Four-year follow-up was conducted.

A high intake of oily fish and fresh legumes were found to be related to delayed onset of natural menopause by 3.3 years per portion/day and 0.9 years per portion/day, respectively. Earlier menopause was reported in relation to the consumption of refined pasta and rice. A higher intake of vitamin B6 and zinc was also shown to be related to a later age of menopause. Overall, some food groups and specific nutrients are individually predictive of age at natural menopause.

**Uterus scars from Abortion.**

BJOG. 2018 Mar 13. doi: 10.1111/1471-0528.15216.

**Intrauterine adhesions following an induced termination of pregnancy: a nationwide cohort study.**

Mentula M<sup>1</sup>, Männistö J<sup>2</sup>, Gissler M<sup>3,4</sup>, Heikinheimo O<sup>1</sup>, Niinimäki M<sup>2</sup>.

*OBJECTIVE:*

Intrauterine adhesions (IUAs) are a problematic complication after termination of pregnancy, but their incidence is unknown. Our objective was to assess the incidence of IUAs following induced termination of pregnancy and the risk factors for IUAs.

*DESIGN:*

Retrospective cohort study.

*SETTING:*

A nationwide registry study.

*SAMPLE:*

All women undergoing induced termination of pregnancy (n = 80 015) in Finland between 2000 and 2008.

*METHODS:*

The data were retrieved from the Finnish Abortion Registry and the Hospital Discharge Registry. The diagnosis of IUAs or complications was based on the diagnostic codes (International Statistical Classification of Diseases and Related Health Problems 10th Revision, ICD-10) and operative codes according to the Nordic Medico-Statistical Committee (NOMESCO) Classification of Surgical Procedures (NCSP). IUAs were defined as ICD-10 code N85.6 or operative code LCG02. A subanalysis of IUA cases and five matched controls was performed.

*MAIN OUTCOME MEASURES:*

The incidence of and risk factors for IUAs.

*RESULTS:*

A total of 12 (1.5 per 10 000) IUA diagnoses were identified from 79 960 eligible induced terminations of pregnancy. The rate of IUAs was 1.5 and 2.0 cases per 10 000 terminations of pregnancy following medically and surgically induced termination of pregnancy, respectively (P = 0.19). In a subgroup analysis of IUA cases and five matched controls, surgical treatment of the remaining products of conception following termination of pregnancy significantly increased the risk of IUAs (odds ratio, OR 5.50; 95% confidence interval, 95% CI 1.46-20.79; P = 0.012).

*CONCLUSION:*

IUAs that require further treatment are rare after an induced termination of pregnancy. Surgical evacuation following medical or surgical termination of pregnancy was a risk factor for the diagnosis of IUAs. These results suggest that trauma to a recently pregnant uterus is an important risk factor for IUAs.

## 8. VISCERA

### COPD and OA

#### Prevalence of osteoarthritis in individuals with COPD: a systematic review

**Authors** Wshah A, Guilcher SJT, Goldstein R, Brooks D

**Published** 16 April 2018 Volume 2018:13 Pages 1207—1216

**DOI** <https://doi.org/10.2147/COPD.S158614>

**Abstract:** The objective of this review was to examine the prevalence of osteoarthritis (OA) in individuals with COPD.

A computer-based literature search of CINAHL, Medline, PsycINFO and Embase databases was performed. Studies reporting the prevalence of OA among a cohort of individuals with COPD were included. The sample size varied across the studies from 27 to 52,643 with a total number of 101,399 individuals with COPD recruited from different countries. The mean age ranged from 59 to 76 years. The prevalence rates of OA among individuals with COPD were calculated as weighted means. A total of 14 studies met the inclusion criteria with a prevalence ranging from 12% to 74% and an overall weighted mean of 35.5%.

Our findings suggest that the prevalence of OA is high among individuals with COPD and should be considered when developing and applying interventions in this population.

**Garlic and fat**

Coron Artery Dis. 2018 Jun;29(4):325-328. doi: 10.1097/MCA.0000000000000587.

**Randomized trial evaluating the effect of aged garlic extract with supplements versus placebo on adipose tissue surrogates for coronary atherosclerosis progression.**

Zeb I<sup>1</sup>, Ahmadi N<sup>2</sup>, Flores F<sup>3</sup>, Budoff MJ<sup>3</sup>.

*AIMS*

Increased epicardial adipose tissue (EAT), pericardial adipose tissue (PAT), periaortic adipose tissue (PaAT), and subcutaneous adipose tissue (SAT) are mediators of metabolic risk, and are associated with the severity of coronary artery calcium (CAC). Aged garlic extract (AGE) has been shown to reduce the progression of coronary atherosclerosis. This study evaluates the effect of AGE with supplements (AGE+S) on EAT, PAT, SAT, and PaAT.

*METHODS:*

Sixty asymptomatic participants participated in a randomized trial evaluating the effect of AGE+S versus placebo on coronary atherosclerosis progression, and underwent CAC at baseline and after 12 months of treatment. EAT, PAT, PaAT, and SAT volumes were measured on CAC scans. PAT was calculated as: intrathoracic adipose tissue-EAT. SAT was defined as the volume of fat depot anterior to the sternum and posterior to the vertebra. PaAT was defined as fat depot around the descending aorta.

*RESULTS:*

At 1 year, the increase in EAT, PAT, PaAT, and SAT was significantly lower in the AGE+S as compared with the placebo group ( $P < 0.05$ ). The odds ratios of increase in EAT, PAT, PaAT, and SAT were 0.63 [95% confidence interval (CI): 0.43-0.90], 0.72 (95% CI: 0.45-0.93), 0.81 (95% CI: 0.65-0.98), and 0.87 (CI: 0.52-0.98), respectively, compared with the placebo group, which even remained significant (all  $P < 0.05$ ) after adjustment for cardiovascular risk factors and statin therapy and BMI.

*CONCLUSION:*

This study shows that AGE+S is associated with favorable effects on reducing the progression rate of adipose tissue volumes.

## CV fitness and dementia

**Cardiorespiratory fitness and risk of dementia: a prospective population-based cohort study**

S Kurl J A Laukkanen E Lonnroos A M Remes H Soininen

*Age and Ageing*, afy060, <https://doi.org/10.1093/ageing/afy060>

Dementia is considered to be one of the major public health problems in light of the ageing population. Little is known about directly measured cardiorespiratory fitness as measured by maximal oxygen uptake and the risk of dementia. Our aim was to examine the relationship of cardiorespiratory fitness, as indicated by maximal oxygen uptake, with subsequent incidence of dementia.

This was a population-based cohort study with an average follow-up of 22 (range 0.22–29.8) years from eastern Finland. About 2,031 men with a mean age of 52.8 years of age and no history of dementia or pulmonary disease at baseline participated in the study. Among these men, 208 cases of dementia occurred. Maximal oxygen uptake (ml/kg/min) was measured during exercise testing at baseline. One standard deviation increase in  $VO_{2max}$  was associated with a 20% decrease in dementia. Cardiorespiratory fitness was inversely related to the risk of dementia. Men with low cardiorespiratory fitness ( $VO_{2max} < 23.7$  ml/kg/min, lowest quintile) had a 1.92-fold (1.24–2.967,  $P = 0.003$ ), risk of dementia as compared with men who had high cardiorespiratory fitness ( $VO_{2max} > 36.5$  ml/kg/min, highest quintile) after adjusting for age and examination years. In a multivariate model, low cardiorespiratory fitness was associated with a 1.95-fold (1.24–3.05,  $P = 0.003$ ) risk of dementia.

Our findings show that low cardiorespiratory fitness was associated with an increased risk of dementia.

## IBS data

Eur J Gastroenterol Hepatol. 2018 Jun;30(6):598-607. doi: 10.1097/MEG.0000000000001072.

**Age at disease onset of inflammatory bowel disease is associated with later extraintestinal manifestations and complications.**

Herzog D<sup>1</sup>, Fournier N<sup>2</sup>, Buehr P<sup>3</sup>, Rueger V<sup>3</sup>, Koller R<sup>3</sup>, Heyland K<sup>3</sup>, Nydegger A<sup>4</sup>, Spalinger J<sup>5</sup>, Schibli S<sup>6</sup>, Petit LM<sup>7</sup>, Braegger CP<sup>3,8</sup>; Swiss IBD Cohort Study Group.

**INTRODUCTION:**

A small but increasing number of patients with inflammatory bowel disease are diagnosed during childhood or adolescence, and disease distribution and severity at onset vary according to the age at diagnosis. Clinical factors present at the time of diagnosis can be predictive of the disease course.

**AIM:**

The aim of this study was to characterize disease behavior and the cumulative complications and extraintestinal manifestations 10 years after the diagnosis and to assess their association with age at diagnosis.

**PATIENTS AND METHODS:**

Data of patients participating with the Swiss IBD cohort study registry, a disease duration of 10 years and a complete data set were analyzed. The outcome was defined as the cumulative change of disease behavior, the occurrence of extra-intestinal manifestations or complications, and the necessity for medical or surgical interventions.

**RESULTS:**

A total of 481 patients with Crohn's disease (CD) and 386 patients with ulcerative colitis (UC), grouped according to disease onset before 10, 17, 40, or after 40 years of age, were analyzed. Despite differences in sex, initial disease location, and smoking habits, at 10 years after the diagnosis, no difference was found regarding disease behavior in CD or regarding progression of disease extension in UC. Similarly, no age-of-onset-dependent cumulative need for medical or surgical therapies was found. However, higher rates of anemia and lower rates of arthralgia and osteopenia were found in both pediatric-onset CD and UC, and a tendency toward higher rates of stomatitis in pediatric-onset CD, and of primary sclerosing cholangitis and ankylosing spondylitis in pediatric-onset UC.

**CONCLUSION:**

After 10 years of disease evolution, age at disease onset is not anymore associated with disease behavior but only with a small difference in the occurrence of specific extraintestinal manifestations and complications.

**10 A. CERVICAL SPINE****C spine motions with different postures**

Clin Spine Surg. 2018 May;31(4):E239-E244. doi: 10.1097/BSD.0000000000000605.

**Characteristics of Cervical Spine Motion in Different Types of Cervical Alignment: Kinematic MRI Study.**

Sessumpun K<sup>1,2</sup>, Paholpak P<sup>1,3</sup>, Hindoyan KN<sup>1</sup>, Tamai K<sup>1,4</sup>, Sangkomkamhang T<sup>2</sup>, Buser Z<sup>1</sup>, Wang JC<sup>1</sup>.

**STUDY DESIGN:**

Retrospective study.

**OBJECTIVE:**

To evaluate how each type of sagittal cervical alignment affects the motion of the upper and subaxial cervical spine using kinematic magnetic resonance imaging.

**SUMMARY OF BACKGROUND DATA:**

The sagittal malalignment of the cervical spine from degeneration in the subaxial cervical spine reflects a disruption in the kinematic properties of the cervical spine and affects the motion of adjacent segments. Changes in the sagittal parameters and kinematics of the upper cervical spine and upper thoracic spine due to the kyphosis are unknown.

**METHODS:**

Kinematic magnetic resonance imaging of the cervical spine in neutral position from 311 patients, including 90 lordotic, 90 straight, 90 global kyphotic, and 41 segmental kyphotic were analyzed. The lordotic angle at the upper and lower cervical spine, and T1 slope were measured in the neutral position and again in flexion and extension for dynamic analysis.

**RESULTS:**

The number of levels with significant disk degeneration was higher in the global kyphosis group. In the global kyphosis group, neutral sagittal parameters showed some characteristics of compensation to the malalignment. Compared with the lordotic group, patients with global kyphosis demonstrated significantly higher lordotic angle of the upper cervical spine and more horizontal T1 slope. The dynamic evaluation showed greater range of motion of the entire cervical spine and subaxial cervical spine in younger patients. However, we still found greater range of motion of the occipito-atlanto-axial complex in global kyphosis, even when controlling for age and number of levels with significant disk degeneration.

**CONCLUSION:**

Sagittal malalignment of the cervical spine affects all parts of the cervical motion complex. The global kyphotic alignment of subaxial cervical spine affects the kinematic properties of the occipito-atlanto-axial complex and upper thoracic spine to compensate for the alteration of cervical alignment. These differences are not seen in straight and segmental kyphosis.

**LEVEL OF EVIDENCE:** Level 3. PMID: 29315118 DOI: 10.1097/BSD.0000000000000605

## 12 B. CERVICAL SURGERIES

### Surgeries and pain

Clin Spine Surg. 2018 May;31(4):E245-E251. doi: 10.1097/BSD.0000000000000619.

#### **Impact of Cervical Sagittal Alignment on Axial Neck Pain and Health-related Quality of Life After Cervical Laminoplasty in Patients With Cervical Spondylotic Myelopathy or Ossification of the Posterior Longitudinal Ligament: A Prospective Comparative Study.**

Fujiwara H<sup>1</sup>, Oda T<sup>1</sup>, Makino T<sup>2</sup>, Moriguchi Y<sup>1</sup>, Yonenobu K<sup>1</sup>, Kaito T<sup>2</sup>.

#### *STUDY DESIGN:*

This is prospective observational study.

#### *OBJECTIVE:*

To prospectively investigate the correlation among axial neck pain; a newly developed patient-based quality of life outcome measure, the Japanese Orthopaedic Association Cervical Myelopathy Evaluation Questionnaire (JOACMEQ); and cervical sagittal alignment after open-door laminoplasty for cervical myelopathy.

#### *SUMMARY OF BACKGROUND DATA:*

Many studies have focused on postoperative axial neck pain after laminoplasty. However, the correlation among cervical sagittal alignment, neck pain, and JOACMEQ has not been investigated.

#### *MATERIALS AND METHODS:*

In total, 57 consecutive patients treated by open-door laminoplasty for cervical myelopathy were included (mean age, 63.7 y; 15 women and 42 men) and divided into 2 groups according to diagnosis [cervical spondylotic myelopathy (CSM) group: 35 patients, and ossification of the posterior longitudinal ligament (OPLL) group: 22 patients]. JOA score, a subdomain of cervical spine function (CSF) in the JOACMEQ, and the visual analog scale for axial neck pain were assessed preoperatively and 12 months postoperatively. Radiographic cervical sagittal parameters were measured by C2 sagittal vertical axis (C2 SVA), C2-C7 lordosis, C7 sagittal slope (C7 slope), and range of motion.

#### *RESULTS:*

C2 SVA values in both groups shifted slightly anteriorly between preoperative and 12-month postoperative measurements (CSM: +19.7±10.9 mm; OPLL: +22.1±13.4 mm vs. CSM: +23.2±16.1 mm; OPLL: +28.7±15.4 mm, respectively). Postoperative axial neck pain in the OPLL group showed strong negative correlations with C2 SVA and C7 slope. Strong negative correlations were found between axial neck pain and CSF in both the preoperative CSM and OPLL groups (CSM:  $r=-0.45$ ,  $P=0.01$ ; OPLL:  $r=-0.61$ ,  $P<0.01$ ) and between axial neck pain and CSF in the postoperative OPLL group ( $r=-0.51$ ,  $P=0.05$ ).

#### *CONCLUSIONS:*

This study demonstrated a significant negative correlation between neck pain and CSF in both the CSM and OPLL groups preoperatively and in the OPLL group postoperatively. Radiographic cervical sagittal alignment did not significantly correlate with preoperative or postoperative axial neck pain.

## Fusions and opioid use

The Spine Journal

**Chronic pre-operative opioid use is a risk factor for increased complications, resource use and costs after cervical fusion**

- Nikhil Jain, MD<sup>1</sup>, John L. Brock, BA<sup>2</sup>, Frank M. Phillips, MD<sup>3</sup>, Tristan Weaver, MD<sup>1</sup>, Safdar N. Khan, MD<sup>1</sup>,

<https://doi.org/10.1016/j.spinee.2018.03.015>

**Background Context** As healthcare transitions to value-based models, there has been an increased focus on patient factors that can influence peri- and post-operative adverse events, resource use, and costs. Many studies have reported risk factors for systemic complications after cervical fusion, but none have studied chronic opioid therapy (COT) as a risk factor.

**Purpose** To answer the following questions from a large cohort of patients who underwent primary cervical fusion for degenerative pathology: (1) What is the patient profile associated with pre-operative COT? (2) Is pre-operative COT a risk factor for 90-day systemic complications, emergency department (ED) visits, readmission, and one-year adverse events? (3) What are the risk factors and one-year adverse events related to long-term post-operative opioid use? and (4) How much did payers reimburse for management of complications and adverse events?

**Study Design** Retrospective review of Humana commercial insurance data (2007-Q3 2015). **Patient Sample** 29,101 patients undergoing primary cervical fusion for degenerative pathology.

**Methods** Patients and procedures of interest were included using International Classification of Diseases (ICD) coding. Patients with opioid prescriptions for >6 months before surgery were considered as having pre-operative COT. Patients with continued opioid use till one-year after surgery were considered as long-term users. Descriptive analysis of patient cohorts has been done. Multiple-variable logistic regression analyses adjusting for approach, number of levels of surgery, discharge disposition, and comorbidities were done to answer first three study questions. Reimbursement data from insurers has been reported to answer our fourth study question.

**Results** Of the entire cohort, 6,643 (22.8%) had pre-operative COT. Pre-operative COT was associated with a higher risk of 90-day wound complications (OR 1.39, 95% CI:1.16-1.66), all-cause 90-day ED visits (adjusted OR 1.22, 95% CI:1.13-1.32), and pain-related ED visits (adjusted OR 1.39, 95% CI:1.24-1.55). Patients who had pre-operative COT were more likely to receive epidural and/or facet joint injections within one-year after surgery (adjusted OR 1.68, 95% CI: 1.47-1.92). These patients were also more likely to undergo a repeat cervical fusion within a year as compared to patients who did not have pre-operative COT (adjusted OR 1.21, 95% CI: 1.01-1.43). Pre-operative COT had a higher likelihood of long-term use after surgery (adjusted OR 4.72, 95% CI:4.41-5.06). Long-term opioid use after surgery was associated with a higher risk of new-onset constipation (adjusted OR 1.34, 95% CI:1.22-1.48). The risk of complications and adverse events was not found to be significant in patients with < 3-months pre-operative opioid use or those who stopped opioids for at-least 6-weeks before surgery. The cost of additional resource use for medications, ED visits, constipation, injections and revision fusion ranged from \$623-\$27,360 per patient.

**Conclusions** Pre-operative opioid use among cervical fusion patients increases complication rates, post-operative opioid usage, healthcare resource utilization and costs. These risks may be reduced by restricting the duration of pre-operative opioid use or weaning off before surgery. Better understanding and management of pain in the pre-operative period with judicious use of opioids is critical to enhance outcomes after cervical fusion surgery.

**13 B. TMJ/ORAL****Micronutrients and oral health**

Aust Dent J. 2018 Mar 6. doi: 10.1111/adj.12606.

**Periodontal disease severity is associated with micronutrient intake.**

Luo PP<sup>1</sup>, Xu HS<sup>1</sup>, Chen YW<sup>2</sup>, Wu SP<sup>1</sup>.

**BACKGROUND:**

This study aimed to examine if specific micronutrients were associated with periodontal disease using data from the US National Health and Nutrition Examination Survey (NHANES) from 2011 to 2014.

**METHODS:**

Participants who were aged 30 years or more and received complete periodontal examinations were included. Regression analyses were performed to determine associations of variables of interest with periodontal disease.

**RESULTS:**

Data of 6415 NHANES participants were included in the analysis. Multivariable analysis revealed that less intake of vitamin A (adjusted odds ratio (aOR) = 1.784), vitamin B1 (aOR = 1.334), vitamin C (aOR = 1.401), vitamin E (aOR = 1.576), iron (aOR = 1.234), folate (aOR = 1.254) and phosphorus (aOR = 1.280) was associated with increased severity of periodontal disease. Compared with the highest level of vitamin D intake, the second highest level of vitamin D intake was associated with lower severity of periodontal disease (aOR = 0.727).

**CONCLUSIONS:**

Insufficient intake of vitamin A, B1, C and E, iron, folate and phosphorus was significantly associated with severity of periodontal disease. Results of the present study suggest that the above micronutrients may be increased in the diet or taken as dietary supplements in order to reduce severity of periodontal disease.

**13 C. AIRWAYS/SWALLOWING/SPEECH****Sleep quality****Sleep quality and covariates as predictors of pain intensity among the general population in rural China**

**Article (PDF Available)** in [Journal of Pain Research](#) Volume 11:857-866 · April 2018 with 16 Reads

DOI: 10.2147/JPR.S156731

The aims of this study were to investigate the distribution of sleep quality and its relationship with the prevalence of pain among rural Chinese people and to explore the association between sleep quality and pain intensity among the general population in real-life settings.

**Methods:** This cross-sectional survey included a total of 2052 adults from rural areas in Liuyang, Hunan Province, recruited through random multistage sampling. The distributions of sleep quality and pain prevalence among the participants over a 4-week period were described. Because of multicollinearity among variables, the influence of self-rated sleep quality and psychosocial covariates on pain intensity was explored using a ridge regression model.

**Results:** The data showed that participants reporting all categories of sleep quality experienced some degree of pain. Sleep quality, along with physical and mental health, was a negative predictor of pain intensity among the general population. Symptoms of depression positively predicted pain intensity.

**Conclusion:** Poor sleep quality increased pain intensity among the participants. Both previous research and the present data suggest that improving sleep quality may significantly decrease pain intensity in the general population. The relationship between sleep and pain may be bidirectional. This finding also suggests that treatment for sleep disorders and insomnia should be addressed in future efforts to alleviate pain intensity. **Keywords:** sleep, pain, depression symptoms, mental health

*Sleep quality and covariates as...* (PDF Download Available). Available from:

[https://www.researchgate.net/publication/324776278\\_Sleep\\_quality\\_and\\_covariates\\_as\\_predictors\\_of\\_pain\\_intensity\\_among\\_the\\_general\\_population\\_in\\_rural\\_China](https://www.researchgate.net/publication/324776278_Sleep_quality_and_covariates_as_predictors_of_pain_intensity_among_the_general_population_in_rural_China) [accessed May 06 2018].

**Insomnia and anxiety**

Depress Anxiety. 2018 Apr 26. doi: 10.1002/da.22764

**Insomnia mediates the longitudinal relationship between anxiety and depressive symptoms in a nationally representative sample of adolescents.**

Li YI<sup>1</sup>, Starr LR<sup>1</sup>, Wray-Lake L<sup>2</sup>.

*BACKGROUND:*

Anxiety and depression are commonly comorbid with each other, with anxiety often temporally preceding the development of depression. Although increasingly research has begun to investigate the role of sleep problems in depression, no study has examined insomnia as a mediator in the longitudinal relationship between anxiety and subsequent depression.

*METHODS:*

The current study utilizes data from Waves I, II, and IV of the National Longitudinal Study of Adolescent to Adult Health, a nationally representative prospective study conducted over a 14-year period (n = 20,745, 50.5% female, M age at Wave I = 16.20). Participants completed portions of the Center for Epidemiologic Studies Depression Scale at Waves I and IV to assess depressive symptoms, a six-item anxiety measure at Wave I, and three items assessing insomnia, sleep quality, and sleep duration at Wave II.

*RESULTS:*

Structural equation modeling indicated that insomnia and unrestful sleep significantly mediated the relationship between anxiety and subsequent depression. The relationship between anxiety and depression was not significantly mediated by sleep duration.

*CONCLUSIONS:*

Findings suggest that anxiety may increase risk for the development of later depression through insomnia.

**Insomnia and suicide**

BMC Psychiatry. 2018 May 2;18(1):117. doi: 10.1186/s12888-018-1702-2.

**Insomnia as an independent predictor of suicide attempts: a nationwide population-based retrospective cohort study.**

Lin HT<sup>1</sup>, Lai CH<sup>1</sup>, Perng HJ<sup>2</sup>, Chung CH<sup>2</sup>, Wang CC<sup>3</sup>, Chen WL<sup>3</sup>, Chien WC<sup>4,5,6</sup>.

**BACKGROUND:**

Numerous studies have verified that insomnia is associated with suicidal ideation, suicide attempts, and death by suicide. Limited population-based cohort studies have been conducted to examine the association. The present study aimed to analyze whether insomnia increases the risk of suicide attempts and verify the effects of insomnia on suicide risk.

**METHODS:**

This study is a cohort study using 2000-2013 hospitalization data from the National Health Insurance Research Database (NHIRD) to track the rate of suicide attempts among insomnia patients aged 15 years or older. In addition, a 1:2 pairing based on sex, age, and date of hospitalization was conducted to identify the reference cohort (patients without insomnia). Cox proportional hazard model was used to assess the effects of insomnia on suicide risk.

**RESULTS:**

The total number of hospitalized patients aged 15 years or older was 479,967 between 2000 and 2013 (159,989 patients with insomnia and 319,978 patients without insomnia). After adjusting for confounders, suicide risk in insomnia patients was 3.533-fold that of patients without insomnia (adjusted hazard ratio [HR] = 3.533, 95% confidence interval [CI] = 3.059-4.080,  $P < 0.001$ ). Suicide risk in low-income patients was 1.434-fold (adjusted HR = 1.434, 95% CI = 1.184-1.736,  $P < 0.001$ ) that of non-low-income patients. Suicide risk in patients with drug dependence and with mental disorders was 1.592-fold (adjusted HR = 1.592, 95% CI = 1.220-2.077,  $P < 0.001$ ) and 4.483-fold (adjusted HR = 4.483, 95% CI = 3.934-5.109,  $P < 0.001$ ) that of patients without drug dependence and without mental disorders, respectively. In the female population, suicide risk in insomnia patients was 4.186-fold (adjusted HR = 4.186, 95% CI = 3.429-5.111,  $P < 0.001$ ) that of patients without insomnia. Among patients aged 25-44 years, suicide risk in insomnia patients was 5.546-fold (adjusted HR = 5.546, 95% CI = 4.236-7.262,  $P < 0.001$ ) that of patients without insomnia. Furthermore, the suicide risk of insomnia patients with mental disorders was 18.322-fold that of patients without insomnia and mental disorders ( $P < 0.001$ ).

**CONCLUSION:**

Insomnia, low income, drug dependence, and mental disorders are independent risk factors for suicide attempts. Female patients and those aged 25-44 years are at high risk of suicide due to insomnia. Insomnia, mental disorders, and low income exhibit a synergistic effect on suicide attempts. Clinicians should pay attention to mental status and income level of insomnia patients.

## Cerebral hypoxia

**Nocturnal cerebral hypoxia in obstructive sleep apnoea – a randomised controlled trial**

Esther I. Schwarz, Michael Furian, Christian Schlatzer, John R. Stradling, Malcolm Kohler, Konrad E. Bloch  
European Respiratory Journal 2018; **DOI:** 10.1183/13993003.00032-2018

**Objectives.** Cerebral hypoxia may promote cerebral damage in patients with obstructive sleep apnoea (OSA). We investigated whether OSA patients experience nocturnal cerebral hypoxia that is prevented by continuous positive airway pressure (CPAP).

**Methods.** OSA patients using CPAP underwent sleep studies including pulse oximetry (SpO<sub>2</sub>) and near-infrared spectroscopy to monitor cerebral tissue oxygenation (CTO) at baseline and after 2 weeks on either subtherapeutic or therapeutic CPAP according to randomised allocation. Changes in oxygenation at end of the 2-week intervention were compared between groups.

**Results.** Among 21 patients (mean apnoea/hypopnoea-index 50.3/h), OSA recurred in all 9 using subtherapeutic and in 0 using therapeutic CPAP: mean (95%CI) between-group differences in changes of oxygen-desaturation-index baseline to 2 weeks +40.7/h(+31.1;+50.4) for SpO<sub>2</sub> and +37.0/h(+25.3;+48.7) for CTO (both p<0.001). Mean nocturnal SpO<sub>2</sub> and CTO decreased more in patients using subtherapeutic vs. therapeutic CPAP: -2.4%(-3.4;-1.1) and -3.8%(-7.4;-0.1), respectively, both p<0.03. Severe CTO-drops ≥13% associated with cerebral dysfunction in previous studies occurred in 4/9 patients using subtherapeutic but in 0/12 using therapeutic CPAP (p=0.01).

**Conclusions.** In patients with OSA, CPAP-withdrawal resulted in nocturnal cerebral deoxygenation suggesting a role of cerebral hypoxia in predisposing untreated OSA patients to cerebral damage.

**Sleep and MS pain**

BMC Musculoskeletal Disorders

December 2018, 19:128|

**Insomnia and risk of chronic musculoskeletal complaints: longitudinal data from the HUNT study, Norway**

B. L. Uhlig T. Sand T. I. Nilsen P. J. Mork K. Hagen

## Background

The aim of this study was to investigate the prospective association between insomnia and risk of chronic musculoskeletal complaints (CMSC) and chronic widespread musculoskeletal complaints (CWMSC). A second aim was to evaluate the association between insomnia and number of body regions with CMSC at follow-up.

## Methods

We used data from the second (HUNT2, 1995–1997) and third (HUNT3, 2006–2008) wave of the Nord-Trøndelag Health Study (the HUNT Study). The population-at-risk included 13,429 people aged 20–70 years who reported no CMSC at baseline in HUNT2 and who answered the questionnaires on insomnia in HUNT2 and CMSC in HUNT3. Insomnia was defined according to the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) with minor modification, whereas CMSC was assessed for nine different body regions. CWMSC was defined according to the 1990 criteria by the American College of Rheumatology. We used Poisson regression to estimate adjusted risk ratios (RRs) for CMSC and CWMSC at 11 years follow-up. Precision of the estimates was assessed by a 95% confidence interval (CIs).

## Results

Insomnia at baseline was associated with increased risk of any CMSC (RR 1.16, 95% CI 1.03–1.32) and CWMSC (RR 1.58, 95% CI 1.26–1.98) at follow-up. RR for CMSC for specific body regions ranged from 1.34 (95% CI 1.05–1.73) for the knees and 1.34 (1.10–1.63) for the neck to 1.60 (95% CI 1.19–2.14) for the ankles/ft. Further, insomnia was associated with increased risk of CMSC in 3–4 regions (RR 1.36, 95% CI 1.05–1.77), and 5 or more regions (RR 1.93, 95% CI 1.40–2.66), but not 1–2 regions (RR 0.99, 95% CI 0.80–1.24).

## Conclusions

Insomnia is associated with increased risk of CMSC, CWMSC, and CMSC located in 3 or more body regions.

## Sleep and pain

## ORIGINAL RESEARCH

**Sleep quality and covariates as predictors of pain intensity among the general population in rural China**

**Authors** Liu XK, Xiao SY, Zhou L, Hu M, Zhou W, Liu HM

**DOI** <https://doi.org/10.2147/JPR.S156731>

**Purpose:** The aims of this study were to investigate the distribution of sleep quality and its relationship with the prevalence of pain among rural Chinese people and to explore the association between sleep quality and pain intensity among the general population in real-life settings.

**Methods:** This cross-sectional survey included a total of 2052 adults from rural areas in Liuyang, Hunan Province, recruited through random multistage sampling. The distributions of sleep quality and pain prevalence among the participants over a 4-week period were described. Because of multicollinearity among variables, the influence of self-rated sleep quality and psychosocial covariates on pain intensity was explored using a ridge regression model.

**Results:** The data showed that participants reporting all categories of sleep quality experienced some degree of pain. Sleep quality, along with physical and mental health, was a negative predictor of pain intensity among the general population. Symptoms of depression positively predicted pain intensity.

**Conclusion:** Poor sleep quality increased pain intensity among the participants. Both previous research and the present data suggest that improving sleep quality may significantly decrease pain intensity in the general population. The relationship between sleep and pain may be bidirectional. This finding also suggests that treatment for sleep disorders and insomnia should be addressed in future efforts to alleviate pain intensity.

**14. HEADACHES****Acupuncture**

## ORIGINAL RESEARCH

**Acupuncture therapy in treating migraine: results of a magnetic resonance spectroscopy imaging study**

Authors Gu T, Lin L, Jiang Y, Chen J, D'Arcy RCN, Chen M, Song X

Published 27 April 2018 Volume 2018:11 Pages 889—900

DOI <https://doi.org/10.2147/JPR.S162696>

**Background:** Acupuncture has been proven to be effective as an alternative therapy in treating migraine, but the pathophysiological mechanisms of the treatment remain unclear. This study investigated possible neurochemical responses to acupuncture treatment.

**Patients and methods:** Proton magnetic resonance spectroscopy imaging was used to investigate biochemical levels pre- and post-acupuncture treatment. Participants (N=45) included subjects diagnosed with: 1) migraine without aura; 2) cervicogenic headache; and 3) healthy controls. Participants in the two patient groups received verum acupuncture using acupoints that target migraine without aura but not cervicogenic headache, while the healthy controls received a sham treatment. All participants had magnetic resonance spectroscopy scans before and after the acupuncture therapy. Levels of brain metabolites were examined in relation to clinical headache assessment scores.

**Results:** A significant increase in N-acetylaspartate/creatine was observed in bilateral thalamus in migraine without aura after the acupuncture treatment, which was significantly correlated with the headache intensity score.

**Conclusion:** The data demonstrate brain biochemical changes underlying the effect of acupuncture treatment of migraine.

## 15. VESTIBULAR

### Aerobic ex helps decrease saccade motions

Neuropsychologia. 2018 Jan 8;108:73-81. doi: 10.1016/j.neuropsychologia.2017.11.029. Epub 2017 Nov 27.

#### **Executive-related oculomotor control is improved following a 10-min single-bout of aerobic exercise: Evidence from the antisaccade task.**

Samani A<sup>1</sup>, Heath M<sup>2</sup>.

Previous work has shown that a single-bout of moderate-to-vigorous intensity exercise improves task-specific activity within frontoparietal networks and produces a short-term 'boost' to executive-related cognitive control - an effect in healthy young adults that is reported to be selective to exercise durations of 20min or greater.

The present study sought to determine whether such a 'boost' extends to an exercise duration as brief as 10min. Healthy young adults performed a 10-min single-bout of moderate-to-vigorous intensity aerobic exercise (i.e., via a cycle ergometer) and pre- and post-exercise executive control was examined via the antisaccade task. Antisaccades are an executive task requiring a goal-directed eye movement (i.e., a saccade) mirror-symmetrical to a visual stimulus. The hands- and language-free nature of antisaccades coupled with the temporal precision of eye-tracking technology make it an ideal tool for identifying executive performance changes. Moreover, an extensive literature has shown that antisaccades are mediated via frontoparietal networks that are modulated following single-bout and chronic exercise training.

Results showed that antisaccade reaction time (RT) reliably decreased by 27ms from pre- to post-exercise assessments. Further, the percentage of antisaccade directional errors did not reliably vary from the pre- (13%) to post-exercise (9%) assessments - a result indicating that the RT improvement was unrelated to a speed-accuracy trade-off. A follow-up experiment involving antisaccade sessions separated by a non-exercise interval did not show a similar RT modulation.

Thus, a 10-min bout of moderate-to-vigorous intensity aerobic exercise benefits executive-related oculomotor control, and is a finding we attribute to an exercise-based increase in attention/arousal and/or improved task-specific activity within the frontoparietal networks supporting antisaccades.

-

## 30 A. IMPINGEMENT

## Scar tissue post-surgery

European Journal of Radiology

**Imaging appearance and distribution of intra-articular adhesions following open FAI surgery** ☆Pascal Cyrill Haefeli<sup>a, \*</sup>, Florian Schmaranzer<sup>a</sup>, Simon Damian Steppacher<sup>a</sup>, Jennifer Cullmann-Bastian<sup>b</sup>, Moritz Tannast<sup>a</sup>, Lorenz Büchler<sup>a</sup><https://doi.org/10.1016/j.ejrad.2018.04.026>**Highlights**

- On direct MRA, femoral adhesions appear primarily as complete obliterations of the peripheral compartment of the hip joint.
- The signal intensity of the adhesions was most commonly of intermediate strength compared to the capsule (hypointense) and contrast (hyperintense).
- Femoral and labral adhesions occur at the site of primary surgical correction.
- The Adhesion alpha angle may be used to quantify the loss of offset due to scar tissue.

**Objectives** To evaluate the appearance and distribution of intra-articular adhesions on direct MR arthrograms (MRA) in symptomatic patients after surgical hip dislocation (SHD) for the treatment of femoroacetabular impingement (FAI).

**Methods**

All 18 patients (19 hips) who underwent arthroscopic debridement for treatment of symptomatic adhesions after open surgery of FAI between 2003 and 2012 and that had a complete set of pre- and postoperative direct MRI were evaluated. On PD-w radial images, pre- and postoperative osseous alpha angles were measured. Signal intensity and degree of obliteration of the peripheral compartment of the hip joint were assessed circumferentially at each ‘half-hour’ position and quantified with the adhesion alpha angle measured between a line connecting the most proximal appearance of adhesions on the femoral neck with the femoral head center and the femoral neck axis). Linear regression analysis was performed between the site of correction and adhesions. As a control group, all patients (9;9 hips) that underwent revision surgery during the same time period in which adhesions were not the primary cause for revision were evaluated.

**Results**

Femoral adhesions primarily (47%) appeared as intermediate, complete obliterations correlating with the site of offset correction ( $R = 0.883$ ,  $p < 0.001$ ). Adhesion alpha angles were comparable to the pre-operative osseous alpha angles (21/24 positions,  $p > 0.05$ ) and were greater than the postoperative osseous alpha angles (11/24 positions,  $p < 0.05$ ). Most labral adhesions (83.2%) appeared as adjacent and correlated with the site of rim trimming ( $R = 0.777$ ,  $p < 0.001$ ). In the control group, the most common reason for revision surgery was persisting cam deformity (67%). The radiographic findings were confirmed intra-operatively.

**Conclusion**

Intra-articular adhesions most commonly appear at the site of primary offset correction. Recurrent impingement due to scar tissue may be quantified with the adhesion alpha angle. MR arthrograms are suitable to distinguish between postoperative adhesions and other known causes for persisting symptoms.

### 35. KNEE/TOTAL

#### Conservative care

#### **Total knee replacement and non-surgical treatment of knee osteoarthritis: 2-year outcome from two parallel randomized controlled trials**

Osteoarthritis and Cartilage — | May 02, 2018

Skou ST, et al.

Experts compared 2-year outcomes of total knee replacement (TKR) followed by non-surgical treatment to that of non-surgical treatment alone and outcomes of the same non-surgical treatment to that of written advice.

Authors noted the greater effectiveness of TKR followed by non-surgical treatment on pain and function vs non-surgical treatment alone, which in turn was more effective than written advice. For at least 2 years following non-surgical treatment, 2 out of 3 patients with moderate to severe knee OA eligible for TKR delayed surgery.

## 42. PLANTAR SURFACE

### Gender differences

#### Impact of plantar fasciitis on the quality of life of male and female patients according to the Foot Health Status Questionnaire

**Authors** Palomo-López P, Becerro-de-Bengoa-Vallejo R, Losa-Iglesias ME, Rodríguez-Sanz D, Calvo-Lobo C, López-López D

**Published** 27 April 2018 Volume 2018:11 Pages 875—880

**DOI** <https://doi.org/10.2147/JPR.S159918>

**Background and purpose:** Plantar fasciitis (PF) is a foot disorder in adults secondary to an inflammatory response caused by repetitive micro-trauma. We evaluated and compared the impact on quality of life (QoL) related to foot health and general health between males and females with PF.

**Methods:** In this cross-sectional descriptive study, patients with PF were recruited from a podiatry clinic. Physical examination, sociodemographic data, and the self-reported Foot Health Status Questionnaire (FHSQ) were recorded. The FHSQ has three sections and provides two composite scores from 0 to 100. Higher scores (close to 100) reflect better QoL related to foot health and health in general; lower scores (close to 0) denote a worse QoL related to these health items.

**Results:** One hundred patients (49 males [42.38 ± 14.065 years old] and 51 females [43.90 ± 14.305 years old]) were recruited. Section one of the FHSQ evaluates four foot domains, and significant differences ( $P < 0.05$ ) were shown for foot pain and footwear, with males having higher scores than females, but not for foot function and general foot health ( $P > 0.05$ ). Section two assesses four domains of general wellbeing, and significant differences ( $P < 0.05$ ) were shown for overall health, physical function, social capacity, and vigor, with males having higher scores than females.

**Conclusion:** Females with PF showed a worse health-related QoL for foot pain, foot function, footwear, and general foot health than males. A better health-related QoL was also shown for males with PF than for females with regard to general health, physical activity, social capacity, and vigor.

**50 A. MOTOR CONTROL****Reaction time and inflammation**

Exp Gerontol. 2018 Apr 6;108:118-124. doi: 10.1016/j.exger.2018.04.002.

**Reaction time in healthy elderly is associated with chronic low-grade inflammation and advanced glycation end product.**

Arnold P<sup>1</sup>, Njemini R<sup>2</sup>, Vantieghem S<sup>3</sup>, Gorus E<sup>4</sup>, Pool-Goudzwaard A<sup>5</sup>, Buyl R<sup>6</sup>, Bautmans I<sup>7</sup>.

Chronic inflammation and Advanced Glycation End products (AGE) are associated with sarcopenia. Decreased voluntary muscle activation and increased antagonist coactivation can contribute to age-related muscle weakness. The influence of chronic inflammation and AGE in these neuromuscular mechanisms is not clear.

We studied whether a relation exists between circulating levels of inflammatory cytokines and AGEs as well as the interplay between agonist and antagonist muscle activation. We studied 64 community-dwelling old subjects, during a maximal isometric voluntary contraction (MVC) and a reaction-time (RT) test of the upper limb. Twenty-five circulating inflammatory biomarkers were determined. Linear regression showed significant relationships between chronic inflammation and six muscle activation parameters. MIP-1 $\beta$  showed a significant negative relation with antagonist coactivation (during MVC) and antagonist muscle activity during pre-movement time (PMT) and movement time (MT) (during RT). A higher level of pentosidine (AGE) was predictive for a longer PMT. We conclude that in older relatively healthy persons antagonist muscle activation is influenced by chronic inflammation, contributing to age-related muscle weakness.

Our results also suggest a mechanical and inflammatory influence of pentosidine in upper limb slowing of movement. These findings show novel insight in underlying mechanisms of age-related muscle weakness.

**52. EXERCISE****Aerobics helps CV disease**

Atherosclerosis

**Aerobic, resistance or combined training: A systematic review and meta-analysis of exercise to reduce cardiovascular risk in adults with metabolic syndrome**

- Michael Wewege<sup>1</sup>, Jeanette Thom, Kerry-Anne Rye, Belinda Parmenter  
<https://doi.org/10.1016/j.atherosclerosis.2018.05.002>

## Highlights

- Aerobic exercise appears the most beneficial mode for individuals with metabolic syndrome without type 2 diabetes.
- Longer duration interventions and progression to higher intensities may enhance the benefits of aerobic exercise.

## Background and aims

Exercise is beneficial for individuals with metabolic syndrome (MetS). An understudied group, who represent the majority of the MetS population, are individuals who have not developed diabetes. This review examined aerobic, resistance and combined (aerobic + resistance) exercise for cardiovascular risk factors in MetS without diabetes.

## Methods

Eight electronic databases were searched up to September 2017 for randomised controlled trials >4 weeks in duration that compared an exercise intervention to non-exercise control in MetS without diabetes. MetS criteria, cardiorespiratory fitness and cardiovascular risk factors were meta-analysed in a random effects model.

## Results

Eleven studies with 16 interventions were included (12 aerobic, 4 resistance). Aerobic exercise significantly improved waist circumference  $-3.4$  cm ( $p < 0.01$ ), fasting glucose  $-0.15$  mmol/L ( $p = 0.03$ ), high-density cholesterol  $0.05$  mmol/L ( $p = 0.02$ ), triglycerides  $-0.29$  mmol/L ( $p < 0.01$ ), diastolic blood pressure  $-1.6$  mmHg ( $p = 0.01$ ), and cardiorespiratory fitness  $4.2$  ml/kg/min ( $p < 0.01$ ), among other outcomes. No significant effects were determined following resistance exercise possibly due to limited data. Sub-analyses suggested that aerobic exercise progressed to vigorous intensity and conducted 3 days/week for  $\geq 12$  weeks offered larger and more widespread improvements.

## Conclusions

Aerobic exercise following current guidelines offers widespread benefits to individuals with MetS without diabetes. More studies on resistance/combined exercise programs in MetS are required to improve the quality of evidence.

**Work and exercise**

Scand J Public Health. 2018 Apr 1:1403494818765894. doi: 10.1177/1403494818765894.

**Is fatigue after work a barrier for leisure-time physical activity? Cross-sectional study among 10,000 adults from the general working population.**

Bláfoss R<sup>1</sup>, Micheletti JK<sup>1,2</sup>, Sundstrup E<sup>1</sup>, Jakobsen MD<sup>1</sup>, Bay H<sup>1</sup>, Andersen LL<sup>1,3</sup>.

**AIM:**

In spite of the many health-related benefits of regular physical activity, fatiguing work may be a barrier to performing leisure-time physical activity. This study investigates the association between work-related fatigue and the duration of low- and high-intensity leisure-time physical activity in workers with sedentary and physically demanding jobs.

**METHODS:**

From the 2010 round of the Danish Work Environment Cohort Study, currently employed wage earners from the general working population (N=10,427) replied to questions about work-related fatigue (predictor) and duration of low- and high-intensity leisure-time physical activity (outcome). Associations were modelled using general linear models controlling for various confounders.

**RESULTS:**

Among workers with physically demanding jobs, higher levels of work-related fatigue were associated with gradually lower levels of leisure-time physical activity - for low, moderate and high levels of work-related fatigue the duration of high-intensity leisure-time physical activity was 133 (95% confidence interval (CI) 127-178), 134 (95% CI 109-160) and 113 (95% CI 86-140) min per week, respectively (trend test  $p < 0.001$ ). The duration of high-intensity leisure-time physical activity was lower among older workers ( $\geq 50$  years) compared to younger workers ( $< 50$  years) ( $132 \pm 126$  vs  $168 \pm 150$  min per week) ( $p < 0.0001$ ).

**CONCLUSIONS:**

The duration of high-intensity leisure-time physical activity gradually decreases with increased work-related fatigue in workers with physically demanding jobs. Older workers perform less high-intensity physical activity than younger workers. Workplaces should consider initiatives to allow workers with physically demanding jobs and older workers to perform physical exercise during working hours and thereby increase physical capacity to meet the job demands.

## 56. ATHLETICS

## Changes with aging

Ageing Research Reviews

Review

**Muscle Morphology and Performance in Master Athletes: A Systematic Review and Meta-analyses**James Mckendry<sup>a, \*</sup>, Leigh Breen<sup>a, b</sup>, Brandon J. Shad<sup>a</sup>, Carolyn Greig<sup>a, b</sup><https://doi.org/10.1016/j.arr.2018.04.007>**Highlights**

- Ageing athletes are a unique population, who maintain excellent health in older age.
- This is the first systematic review and meta-analyses of data from master athletes.
- Age-associated decrements in physical function are offset in master athletes.
- Unfavourable fat mass gain is mitigated in master athletes.

**Introduction**

The extent to which chronic exercise training preserves age-related decrements in physical function, muscle strength, mass and morphology is unclear. Our aim was to conduct a systematic review of the literature to determine to what extent chronically trained master athletes (strength/power and endurance) preserve levels of physical function, muscle strength, muscle mass and morphology in older age, compared with older and younger controls and young trained individuals.

**Methods**

The systematic data search included Medline, EMBASE, SPORTDiscus, CINAHL and Web of Science databases. **Inclusion criteria:** i) master athletes mean exercise training duration  $\geq 20$  years ii) master athletes mean age of cohort  $> 59$  years iii) at least one measurement of muscle mass/volume/fibre-type morphology and/or strength/physical function.

**Results**

Fifty-five eligible studies were identified. Meta-analyses were carried out on maximal aerobic capacity, maximal voluntary contraction and body composition. Master endurance athletes ( $42.0 \pm 6.6 \text{ ml kg}^{-1} \text{ min}^{-1}$ ) exhibited  $\text{VO}_{2\text{max}}$  values comparable with young healthy controls ( $43.1 \pm 6.8 \text{ ml kg}^{-1} \text{ min}^{-1}$ ,  $P = 0.84$ ), greater than older controls ( $27.1 \pm 4.3 \text{ ml.kg}^{-1} \text{ min}^{-1}$ ,  $P < 0.01$ ) and master strength/power athletes ( $26.5 \pm 2.3 \text{ ml.kg}^{-1} \text{ min}^{-1}$ ,  $P < 0.01$ ), and lower than young endurance trained individuals ( $60.0 \pm 5.4 \text{ ml kg}^{-1} \text{ min}^{-1}$ ,  $P < 0.01$ ). Master strength/power athletes (0.60 (0.28 to 0.93)  $P < 0.01$ ) and young controls (0.71 (0.06 to 1.36)  $P < 0.05$ ) were significantly stronger compared with the other groups. Body fat % was greater in master endurance athletes than young endurance trained ( $-4.44\%$  ( $-8.44$  to  $-0.43$ )  $P < 0.05$ ) but lower compared with older controls (7.11% (5.70 to 8.52)  $P < 0.01$ ).

**Conclusion**

Despite advancing age, this review suggests that chronic exercise training preserves physical function, muscular strength and body fat levels similar to that of young, healthy individuals in an exercise mode-specific manner.

**58. RUNNING****Knee OA and running****Running does not increase symptoms or structural progression in people with knee osteoarthritis: Data from the osteoarthritis initiative**

Clinical Rheumatology — | May 07, 2018

Lo GH, et al.

Researchers assessed the relationship of self-selected running on osteoarthritis (OA) symptom and structure progression in people with knee OA. In individuals 50 years old and older with knee OA, an association of self-selected running with improved knee pain and not with worsening knee pain or radiographically defined structural progression was seen. Hence, 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 using 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 of self-selected running with outcomes: KL worsening, medial JSN worsening, new knee pain, and improved knee pain over 48 months, adjusting for baseline age, sex, body mass index (BMI), KL score, contralateral KL score, contralateral knee pain, and injury were evaluated.
- In case of unavailability of data at the 48-month visit, they were imputed from the 36-month visit.

## 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% male, and 11.5% runners.
- Results suggested that data from 8% of participants required 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).

**59. PAIN****Neuroinflammation****Neuroinflammation of the spinal cord and nerve roots in chronic radicular pain patients**

Albrecht, Daniel, S.a,b; Ahmed, Shihab, U.c; Kettner, Norman, W.d; Borra, Ronald, J.H.e,f; Cohen-Adad, Julieng,h; Deng, Haoi; Houle, Timothy, T.i; Opalacz, Arissac; Roth, Sarah, A.c; Melo, Marcos F., Vidali; Chen, Lucyc; Mao, Jianrenc; Hooker, Jacob, M.a; Loggia, Marco, L.a; Zhang, Yic,\*

PAIN: May 2018 - Volume 159 - Issue 5 - p 968–977

doi: 10.1097/j.pain.0000000000001171

Numerous preclinical studies support the role of spinal neuroimmune activation in the pathogenesis of chronic pain, and targeting glia (eg, microglia/astrocyte)- or macrophage-mediated neuroinflammatory responses effectively prevents or reverses the establishment of persistent nocifensive behaviors in laboratory animals. However, thus far, the translation of those findings into novel treatments for clinical use has been hindered by the scarcity of data supporting the role of neuroinflammation in human pain. Here, we show that patients suffering from a common chronic pain disorder (lumbar radiculopathy), compared with healthy volunteers, exhibit elevated levels of the neuroinflammation marker 18 kDa translocator protein, in both the neuroforamina (containing dorsal root ganglion and nerve roots) and spinal cord. These elevations demonstrated a pattern of spatial specificity correlating with the patients' clinical presentation, as they were observed in the neuroforamen ipsilateral to the symptomatic leg (compared with both contralateral neuroforamen in the same patients as well as to healthy controls) and in the most caudal spinal cord segments, which are known to process sensory information from the lumbosacral nerve roots affected in these patients (compared with more superior segments). Furthermore, the neuroforaminal translocator protein signal was associated with responses to fluoroscopy-guided epidural steroid injections, supporting its role as an imaging marker of neuroinflammation, and highlighting the clinical significance of these observations. These results implicate immunoactivation at multiple levels of the nervous system as a potentially important and clinically relevant mechanism in human radicular pain, and suggest that therapies targeting immune cell activation may be beneficial for chronic pain patients.

**62 A. NUTRITION/VITAMINS****Eggs healthy**

European Journal of Nutrition pp 1–12|

**Egg consumption and the risk of cardiovascular disease and all-cause mortality: Guangzhou Biobank Cohort Study and meta-analyses**

Lin Xu Tai Hing Lam Chao Qiang Jiang Wei Sen Zhang eng Zhu Ya Li Jin Jean Woo Kar Keung Cheng G. Neil Thomas

**Purpose**

Eggs are highly nutritious but concerns over their cholesterol content have led to dietary avoidance among many. There are also important international differences in relevant dietary guidance. We conducted the first prospective study in China investigating the association of egg consumption, cardiovascular disease (CVD) mortality, and a meta-analysis.

**Methods**

We included 28,024 participants without CVD at baseline (2003-8) in Guangzhou Biobank Cohort Study. All-cause and CVD mortality were identified through record linkage. We used Cox proportional hazards regression. We followed the Meta-analysis Of Observational Studies in Epidemiology reporting guidelines.

**Results**

During 275,343 person-years follow-up (average 9.8 years), we found 2685 all-cause and 873 CVD deaths. We found no significant difference in all-cause mortality between higher (7+ eggs/week) and low consumption (< 1 egg/week) [adjusted hazard ratio (HR) 1.08, 95% confidence interval (CI) 0.93–1.24], and mortality from CVD (0.99, 95% CI 0.76–1.27), ischemic heart disease (IHD) (0.92, 95% CI 0.63–1.36), or stroke (0.88, 95% CI 0.57–1.35). The updated meta-analyses including our results showed that 7+ eggs/week was not associated with all-cause mortality (HR 1.09, 95% CI 0.997–1.200) or IHD (HR 0.97, 95% CI 0.90–1.05), but associated with a small reduction in stroke (HR 0.91, 95% CI 0.85–0.98).

**Conclusions**

Eating one egg daily is not associated with increase in CVD or all-cause mortality. The small observed reduction in stroke risk needs to be confirmed. Our findings support current guidelines recommending eggs as part of a healthy diet, and should be considered in other dietary recommendations.