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## 2. LBP

### Motivation as an important factor in managing LBP

#### Motivation and Self-Management Behavior of the Individuals With Chronic Low Back Pain

Jung, Mi Jung; Jeong, Younhee

**Purpose:** Self-management behavior is an important component for successful pain management in individuals with chronic low back pain. Motivation has been considered as an effective way to change behavior. Because there are other physical, social, and psychological factors affecting individuals with pain, it is necessary to identify the main effect of motivation on self-management behavior without the influence of those factors. The purpose of this study was to investigate the effect of motivation on self-management in controlling pain, depression, and social support.

**Methods:** We used a nonexperimental, cross-sectional, descriptive design with mediation analysis and included 120 participants' data in the final analysis. We also used hierarchical multiple regression to test the effect of motivation, and multiple regression analysis and Sobel test were used to examine the mediating effect.

**Results:** Motivation itself accounted for 23.4% of the variance in self-management,  $F(1, 118) = 35.003, p < .001$ . After controlling covariates, motivation was also a significant factor for self-management. In the mediation analysis, motivation completely mediated the relationship between education and self-management,  $z = 2.292, p = .021$ .

**Conclusion:** Motivation is an important part of self-management, and self-management education is not effective without motivation. The results of our study suggest that nurses incorporate motivation in nursing intervention, rather than only giving information.

### Stenosis and multifidus

*BMC Musculoskelet Disord.* 2016 Oct 10;17(1):422.

#### Paraspinal muscles density: a marker for degenerative lumbar spinal stenosis?

Abbas J<sup>1,2</sup>, Slon V<sup>3</sup>, May H<sup>3</sup>, Peled N<sup>4</sup>, Hershkovitz I<sup>3</sup>, Hamoud K<sup>5,6,7</sup>.

#### **BACKGROUND:**

The condition of paraspinal muscles is known to be associated with some variables such as age, gender, and low back pain. It is generally agreed that these muscles play an important role in the stability and functional movements of the lumbar vertebral column. Although spinal instability has been shown to play an essential role in degenerative lumbar spinal stenosis (DLSS), the role of paraspinal muscles remains elusive. The main purpose of this study was to shed light on the relationship between the condition of paraspinal muscles and symptomatic DLSS.

#### **METHODS:**

Two sample populations were studied. The first included 165 individuals with DLSS (age range: 40-88, sex ratio: 80 M/85 F) and the second 180 individuals without spinal stenosis related symptoms and low back pain (age range: 40-99, sex ratio: 90 M/90 F). Measurements were taken at the middle part of L3 vertebral body, using CT axial images (Philips Brilliance 64). Muscles density was measured in Hounsfield units (HU) using a 50 mm<sup>2</sup> circle of the muscle mass at three different locations and the mean density was then calculated. The cross-sectional area (CSA) was

also measured using the quantitative CT angiography method. Analysis of Covariance (adjusted for body mass index and age) was performed in order to determine the relationship between the condition of paraspinal muscles and symptomatic DLSS.

**RESULTS:**

Individuals in the stenosis group had higher muscle density as compared to the control group. The CSA values for the erector spinae (both sexes) and psoas (males) muscles were significantly greater in the stenosis group as compared to their counterparts in the control group. Additionally, density of multifidus (both sexes) and erector spinae (males) muscles was significantly associated with symptomatic DLSS.

**CONCLUSIONS:**

Our results show that individuals with symptomatic DLSS manifest greater paraspinal muscles density and CSA (erector spinae), compared to the control group. Density of multifidus increases the likelihood of symptomatic DLSS.

**KEYWORDS:**

Computerized tomography (CT); Degenerative lumbar spinal stenosis; Muscle cross-sectional area size; Paraspinal muscles density

Stenosis best evaluated with MRI

Eur Spine J. 2016 Sep 23

**Radiographic assessment of degenerative lumbar spinal stenosis: is MRI superior to CT?**

Alsaleh K<sup>1,2,3</sup>, Ho D<sup>4</sup>, Rosas-Arellano MP<sup>5</sup>, Stewart TC<sup>5</sup>, Gurr KR<sup>6,5</sup>, Bailey CS<sup>6,5</sup>.

**OBJECTIVE:**

To determine the reliability and dependability of magnetic resonance imaging (MRI) and computerized tomography (CT) in the assessment of lumbar spinal stenosis and correlate the qualitative assessment to both a quantitative assessment and functional outcome measures. Multiple studies have addressed the issue of CT and MRI imaging in lumbar spinal stenosis. None showed superiority of one modality.

**METHODS:**

We performed a standardized qualitative and quantitative review of CT and MRI scans of 54 patients. Intra-observer and inter-observer reliability was determined between three reviewer using Kappa coefficient. Agreement between the two modalities was analyzed. ODI and SF-36 outcomes were correlated with the imaging assessments.

**RESULTS:**

Almost perfect intra-observer reliability for MRI was achieved by the two expert reviewers ( $\kappa = 0.91$  for surgeon and  $\kappa = 0.92$  for neuro-radiologist). For CT, substantial intra-observer agreement was found for the surgeon ( $\kappa = 0.77$ ) while the neuro-radiologist was higher ( $\kappa = 0.96$ ). For both CT and MRI the standardized qualitative assessment used by the two expert reviewers had a better inter-observer reliability than that between the expert reviewers and the general reporting radiologist, who did not utilize a standardized assessment system. When the qualitative assessment was compared directly, CT overestimated the degree of stenosis 20-35 % of the time ( $p < 0.05$ ) while MRI overestimated the degree of stenosis 2-11 % of the time ( $p < 0.05$ ). No correlation was found between qualitative and quantitative analysis with functional status.

**CONCLUSIONS:**

This study directly demonstrates that MRI is a more reliable tool than CT, but neither correlates with functional status. Both experience of the reader and the standardization of a qualitative assessment are influential to the reliability.

**Hospitalizations and PT**

Spine (Phila Pa 1976). 2016 Oct 1;41(19):1515-22. doi: 10.1097/BRS.0000000000001571.

**Physical Therapy and Hospitalization Among Medicare Beneficiaries With Low Back Pain: A Retrospective Cohort Study.**

de Heer HD<sup>1</sup>, Warren M.

**STUDY DESIGN:**

A retrospective cohort study.

**OBJECTIVE:**

The aim of this study was to evaluate associations between receipt and quantity of outpatient physical therapy (PT) during an episode of care and 30-day and 180-day hospital admissions for any condition and lumbar spine conditions.

**SUMMARY OF BACKGROUND DATA:**

Low back pain (LBP) is a common cause of hospitalization and the most common reason Medicare beneficiaries utilize outpatient PT. The association between PT and hospitalization among patients with LBP is unknown.

**METHODS:**

A national sample of Medicare Fee-for-Service claims included 413,608 beneficiaries with an International Classification of Disease 9th revision (ICD-9) code of LBP and 1,415,037 episodes of care between June 1, 2010, and June 30, 2011. Episodes were classified as PT episodes or non-PT episodes. Relative risk of hospitalization from the episode start date was calculated, adjusting for health status (Charlson comorbidity index), prior care utilization (number of prior hospitalizations and total number of episodes), an indicator of LBP severity (number of LBP ICD-9 codes), and demographics (sex, race/ethnicity, age).

**RESULTS:**

The proportion of 30-day hospitalization for any condition was 3.42% for PT episodes of care and 6.54% for non-PT episodes. For 180-day hospitalization, proportions were 15.45% (PT) and 21.65% (non-PT). The adjusted relative risk reduction of PT (vs. non-PT) was 41% for 30 days [99% confidence interval (CI) 38-44] and 22% for 180 days (20-24). For admitting diagnoses of lumbar spine, reductions were 65% at 30 days and 32% at 180 days. More PT treatment days showed greater 30-day risk reductions. For any condition, compared with non-PT, reductions were 24% for 1 to 2 treatment days (lowest tertile), 45% for 3 to 7 days, and 65% for more than 8 days (highest tertile). Stronger effects were found for lumbar spine admissions. Associations between PT quantity and 180-day hospitalization were less consistent. Limitations of Medicare claims include the potential for inaccuracies, limited knowledge about disease severity, and which PT interventions were conducted.

**CONCLUSION:**

Receipt of PT during an episode had a 22% to 65% reduced relative risk of hospitalization, with greater short-term reductions for more PT treatment days.

**LEVEL OF EVIDENCE: 3.**

PMID: 26998645

DOI: 10.1097/BRS.0000000000001571

**Spinal stenosis**

Eur J Orthop Surg Traumatol. 2016 Oct;26(7):695-704. doi: 10.1007/s00590-016-1818-3. Epub 2016 Jul 25.

**Surgical and nonsurgical treatments for lumbar spinal stenosis.**

Inoue G<sup>1</sup>, Miyagi M<sup>2</sup>, Takaso M<sup>2</sup>.

Lumbar spinal stenosis (LSS) is the most common indication for spinal surgery in older adults; however, the efficacy of surgery for LSS as compared to nonsurgical treatments remains unclear.

Here, we reviewed numerous studies, including randomized control trails (RCTs), to compare nonsurgical and surgical treatments for LSS. The nonsurgical management of LSS includes medication, epidural injections, physiotherapy, lifestyle modification, and multidisciplinary rehabilitative approaches. Patients with LSS who do not improve after nonsurgical treatments are typically treated surgically using decompressive surgery, which has the strongest evidence base.

Although decompressive surgical treatment is associated with modestly successful outcomes, it remains unclear whether decompression combined with fusion surgery results in clinical outcomes that are superior to those following decompression surgery alone. Future RCTs assessing the effectiveness of specific treatments based on high-quality scientific evidence are expected to aid clinical decision-making and improve treatment outcomes for LSS.

**KEYWORDS:**

Lumbar spinal stenosis; Medication; Surgery; Treatment

**Inflammation and LBP**

Brain Behav Immun. 2016 Oct 6. pii: S0889-1591(16)30459-7. doi: 10.1016/j.bbi.2016.10.003.

**Systemic inflammatory profiles and their relationships with demographic, behavioural and clinical features in acute low back pain.**

Klyne DM<sup>1</sup>, Barbe MF<sup>2</sup>, Hodges PW<sup>3</sup>.

Systemic inflammation is linked with development and persistence of many pathological pain states.

Although chronic phase inflammatory responses are well reported, the acute phase has received limited attention. Here we investigated circulating pro-inflammatory cytokines and C-reactive protein (CRP), and explored their relationships with symptom severity and other factors in acute low back pain (LBP).

Ninety-nine individuals within two weeks of onset of acute LBP and 55 pain-free controls completed questionnaires related to their pain (visual analogue scale, VAS) and disability, behaviour, sleep quality and psychological status. CRP, interleukin-6 (IL-6), tumor necrosis factor (TNF) and interleukin-1 $\beta$  (IL-1 $\beta$ ) were measured from serum samples. Biomarkers were compared between LBP and control participants, and in a separate analysis, for those with "high-pain" (VAS $\geq$ 4) and "low-pain" (VAS $<$ 4). The relationships between biomarkers and all other variables, including other cytokines/CRP were assessed. CRP was higher in LBP than controls and in those with high- than low-pain ( $p<0.01$ ). IL-6 was higher in those with high- than low-pain ( $p<0.05$ ), but not controls. Various pain and non-pain factors were associated with each biomarker differently.

These findings suggest systemic CRP and IL-6 are important contributors to inflammation in the early post-onset phase of LBP and that various factors can shape these responses.

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PMID: [27720935](#)

DOI:[10.1016/j.bbi.2016.10.003](#)

## Epidemiology of LBP

### **The epidemiology of back pain and its relationship with depression, psychosis, anxiety, sleep disturbances, and stress sensitivity: Data from 43 low- and middle-income countries**

General Hospital Psychiatry, 10/10/2016

Stubbs B, et al.

Researchers conducted this study to not only determine the epidemiology of back pain (BP) in 43 low- and middle-income countries (LMICs) but also to investigate the relationship amongst BP and mental health (depression spectrum, psychosis spectrum, anxiety, sleep disturbances and stress). In the result, they found that BP is related with elevated mental health comorbidity in LMICs. Integrated interventions that address back pain and metal health comorbidities may be an important next step to tackle this considerable burden.

#### Methods

- Information on 190,593 community-dwelling adults aged  $\geq 18$  years from the World Health Survey (WHS) 2002–2004 were investigated.
- The presence of past-12 month psychotic symptoms and depression was established utilizing questions from the Composite International Diagnostic Interview.
- Anxiety, sleep problems, stress sensitivity, and any BP or chronic BP (CBP) during the previous 30 days were also self-reported.
- Multivariable logistic regression analyses were attempted.

#### Results

- Researchers found that the overall prevalence of any BP and CBP were 35.1% and 6.9% respectively.
- Significant relationship with any BP were seen for subsyndromal depression [OR (odds ratio) = 2.21], brief depressive episode (OR=2.64), depressive episode (OR=2.88), psychosis diagnosis with symptoms (OR=2.05), anxiety (OR=2.12), sleep disturbance (OR=2.37) and the continuous variable of stress sensitivity.
- Results revealed that affiliations were generally more pronounced for Chronic BP.

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Dysmenorrhea

Fertil Steril. 2016 Oct 4. pii: S0015-0282(16)62790-5. doi: 10.1016/j.fertnstert.2016.08.051.

#### **Evaluation of an ultra-low-dose oral contraceptive for dysmenorrhea: a placebo-controlled, double-blind, randomized trial.**

Harada T<sup>1</sup>, Momoeda M<sup>2</sup>.

#### **OBJECTIVE:**

To evaluate the efficacy and safety of an ultra-low-dose oral contraceptive (NPC-01; 0.02 mg ethinyl estradiol and 1 mg norethisterone) in subjects with dysmenorrhea.

#### **DESIGN:**

Placebo-controlled, double-blind, randomized trial.

#### **SETTING:**

Clinical trial sites.

#### **PATIENT(S):**

Two hundred fifteen subjects with dysmenorrhea.

#### **INTERVENTION(S):**

Subjects were randomly assigned to receive NPC-01, placebo, or IKH-01 (0.035 mg ethinyl estradiol and 1 mg norethisterone) for four cycles.

#### **MAIN OUTCOME MEASURE(S):**

Total dysmenorrhea score (verbal rating scale) assessing pain on the basis of limited ability to work and need for analgesics.

#### **RESULT(S):**

The reductions of total dysmenorrhea score and visual analog scale score after the treatment were significantly higher in the NPC-01 group than in the placebo group. Furthermore, the efficacy of NPC-01 was comparable to that of IKH-01. The overall incidence of side effects was significantly higher in the NPC-01 group than in the placebo group. All side effects that occurred in the NPC-01 group were previously reported in patients receiving IKH-01. No serious side effects occurred.

#### **CONCLUSION(S):**

The ultra-low-dose contraceptive NPC-01 relieved dysmenorrhea as effectively as IKH-01. Thus, NPC-01 could represent a new option for long-term treatment of dysmenorrhea.

#### **CLINICAL TRIAL IDENTIFICATION NUMBER:**

NCT01129102.

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#### **KEYWORDS:**

Ultra-low-dose oral contraceptives; dysmenorrhea; placebo-controlled randomized trial

### New thoughts on twins and delivery

#### **Most twins should be delivered at 37 weeks to minimise deaths**

Queen Mary University of London News,

Scientists at Queen Mary University of London (QMUL) have analysed the twin pregnancies of more than 30,000 women to identify the ideal delivery period in an attempt to reduce rates of stillbirth.

In the largest review of its kind the researchers recommend that in the case of pregnancies without complications, women with dichorionic twins should be offered delivery after 37 weeks. They also recommend that women with monochorionic twins should not be offered delivery before 36 weeks. The study was published in the British Medical Journal.

**Menstrual cycles and cancer****Long and irregular menstrual cycles, polycystic ovary syndrome, and ovarian cancer risk in a population-based case control study**

International Journal of Cancer, 09/28/2016

Harris HR, et al.

Inferences drawn from this study indicated that menstrual cycle irregularity was connected with a diminished risk of high grade serous tumors but an 4 | Page ABSTRACTS expanded risk of serous borderline tumors among women who had never used OCs and those who were overweight. Methods • In this study, the researchers explored whether menstrual cycle characteristics and self-reported PCOS were connected with ovarian cancer risk among 2041 women with epithelial ovarian cancer and 2100 controls in the New England Case-Control Study (1992-2008).

- Menstrual cycle irregularity, menstrual cycle length, and PCOS were gathered through in-person interview.
- Unconditional logistic regression models were utilized to calculate odds ratios (OR) and 95% confidence intervals (95% CIs) for ovarian cancer risk overall, and polytomous logistic regression to assess whether risk differed between histologic subtypes.

**Results**

- This study found no elevation in ovarian cancer risk for women who reported periods that were never regular or for those reporting a menstrual cycle length of >35 days with ORs of 0.87 (95% CI=0.69-1.10) and 0.83 (95% CI=0.44-1.54), respectively.
- They observed no overall relationship between self-reported PCOS and ovarian cancer (OR=0.97; 95% CI=0.61-1.56).
- They observed significant differences in the relationship with menstrual cycle irregularity and risk of ovarian cancer subtypes (pheterogeneity=0.03) as well as by BMI and OC use (pinteraction

**Total hips and incontinence**

Int Urogynecol J. 2016 Sep 16.

**Prospective analyses of female urinary incontinence symptoms following total hip arthroplasty.**

Okumura K<sup>1,2</sup>, Yamaguchi K<sup>3</sup>, Tamaki T<sup>4</sup>, Oinuma K<sup>4</sup>, Tomoe H<sup>5</sup>, Akita K<sup>6</sup>.

**INTRODUCTION AND HYPOTHESIS:**

Some patients with hip osteoarthritis report that urinary incontinence (UI) is improved following total hip arthroplasty (THA). However, the type and severity of UI remain unclear. In this study, we hypothesize that both stress urinary incontinence (SUI) and urge urinary incontinence (UUI) are improved after THA. We assess the characteristics of UI and discuss the anatomical factors related to UI and THA for improved treatment outcome.

**METHODS:**

Fifty patients with UI who underwent direct anterior-approach THA were evaluated. Type of UI was assessed using four questionnaires: Core Lower Urinary Tract Symptom Score (CLSS), Urogenital Distress Inventory Short Form (UDI-6), International Prostate Symptom Score (IPSS), and Overactive Bladder Symptom Score (OABSS). Uroflowmetry and postvoid residual urine were measured using ultrasound technology. Hip-joint function was evaluated using Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and range of motion (ROM).

**RESULTS:**

Of the 50 patients, 21 had SUI, 16 had mixed urinary incontinence (MUI), and eight had urgency urinary incontinence (UUI). In total, 36 patients were better than improved (72 %). The rate of cured and improved was 76 % for SUI, 100 % MUI, and 50 % UUI. The improvement of ROM was more significant in cured or improved patients than in stable or worse patients.

**CONCLUSIONS:**

Improvement in mild UI may be an added benefit for those undergoing THA for hip-joint disorders. These data suggest that for patients with hip-joint disorder, hip-joint treatment could prove to also be a useful treatment for UI.

**KEYWORDS:**

Core lower urinary tract symptom score; Female urinary incontinence; Hip joint disorder; Total hip arthroplasty

## 8. VISCERA

### IBS helped by FODMAP diet

#### **A randomized controlled trial comparing the low FODMAP diet vs. modified NICE guidelines in US adults with IBS-D**

The American Journal of Gastroenterology, 10/12/2016

Eswaran SL, et al.

The present sub-study keeping the objective in mind, suggest that with the low fermentable oligo-, di-, and monosaccharides and polyols (FODMAPs) diet or a diet based on modified NICE guidelines, 40–50% of patients reported adequate relief of their irritable bowel syndrome (IBS) and diarrhea (IBS-D) symptoms. The low FODMAP diet led to significantly greater improvement in individual IBS symptoms, especially pain and bloating, compared with the mNICE diet.

#### Methods

- The researchers conducted a single-center, randomized-controlled trial of adult patients with IBS-D (Rome III) which compared 2 diet interventions.
- After a 2-week screening period, they randomized eligible patients to a low FODMAP or mNICE diet for 4 weeks.
- The initial end point was the proportion of patients reporting adequate relief of IBS-D symptoms  $\geq 50\%$  of intervention weeks 3–4.
- In this study, secondary outcomes included a composite end point which required response in both abdominal pain ( $\geq 30\%$  reduction in mean daily pain score compared with baseline) and stool consistency (decrease in mean daily Bristol Stool Form of  $\geq 1$  compared with baseline), abdominal pain and stool consistency responders, and other key individual IBS symptoms evaluated using daily questionnaires.

#### Results

- The researchers randomized 92 subjects (65 women, median age 42.6 years) after screening.
- This study was completed by 84 patients (45 low FODMAP, 39 mNICE).
- Between groups, baseline demographics, symptom severity, and nutrient intake were similar.
- 52% of the low FODMAP versus 41% of the mNICE group reported adequate relief of their IBS-D symptoms ( $P=0.31$ ).
- In spite of the fact that there was no significant difference in the proportion of composite end point responders ( $P=0.13$ ), the low FODMAP diet resulted in a higher proportion of abdominal pain responders compared with the mNICE group (51% vs. 23%,  $P=0.008$ ).
- The low FODMAP diet led to greater reductions in average daily scores of abdominal pain, bloating, consistency, frequency, and urgency than the mNICE diet as compared with baseline scores.

**IBS diagnosis**

Clin Gastroenterol Hepatol. 2016 Sep 16. pii: S1542-3565(16)30669-3. doi: 10.1016/j.cgh.2016.09.012.

**Factors that Predict High Health Care Utilization and Costs for Patients With Inflammatory Bowel Diseases.**

Limsrivilai J<sup>1</sup>, Stidham RW<sup>2</sup>, Govani SM<sup>3</sup>, Waljee AK<sup>3</sup>, Huang W<sup>4</sup>, Higgins PD<sup>5</sup>.

**BACKGROUND & AIMS:**

A subset of patients with inflammatory bowel diseases (IBD) have continuously active inflammation, leading to a high number of complications and high direct healthcare costs (diagnostic tests, medications, and surgeries) and indirect costs (reduced employment and productivity and fewer opportunities for activities). Identifying these high-risk patients and providing effective interventions could produce better outcomes and reduce costs. We used prior year data to create IBD risk models to predict IBD-related hospitalizations, emergency department visits, and high treatment charges (>\$30,000/year) in the subsequent year.

**METHODS:**

We performed a retrospective study of medical records from all patients with IBD patients treated at the University of Michigan Hospital from fiscal years 2013-2015. We selected clinical variables from the prior year and tested their abilities to predict 3 adverse outcomes (IBD-related hospitalizations, emergency department visits, and treatment charges >\$30,000/year) in the subsequent year. Individual patients were only included once in the dataset. We created a multivariate model based on a 70% randomly selected cohort (1005 patients), and validated the model on the other 30% (425 patients). Logistic regression was used for bi-variate and multivariate analyses.

**RESULTS:**

Factors that predicted high-cost outcomes included the presence of psychiatric illness, use of corticosteroids, use of narcotics, low levels of hemoglobin, and high numbers of IBD-related hospitalizations. In the validation cohort, the model predicted IBD-related hospitalizations, emergency department visits, and high charges in the following year with receiver-operating characteristic curve values of 0.751, 0.738, and 0.744, respectively.

**CONCLUSION:**

We identified 5 factors that can effectively identify patients with IBD at high risk for hospitalization, emergency department visits, and high treatment charges in the next year. These patients should be closely monitored and aggressively managed.

### Red meat and CA risks increase

#### **Association between consumption of red and processed meat and pancreatic cancer risk-A systematic review and meta-analysis**

Clinical Gastroenterology and Hepatology ,  
10/04/2016  
Zhao Z, et al.

A systematic review and meta-analysis were conducted to examine the association between consumption of red and processed meat and pancreatic cancer risk. The researchers found case-control, but not cohort studies, to associate consumption of red and processed meat with risk of pancreatic cancer. But, in cohort studies, consumption of red and processed meat seemed to increase risk of pancreatic cancer in men but not in women.

**Methods** • A systematic search of PubMed, EMBASE, and the Web of Science was performed to identify studies that analysed associations between consumption of different kinds of meat with pancreatic cancer, published through February 2016. • They associated level of consumption with cancer risk, and performed subgroup, meta-regression, and publication bias analyses using data from these articles.

#### **Results**

- They analyzed and collected data from a total of 28 studies, involving 3,143,777 participants (11,325 consumers of red meat) and 2,904,866 participants (9,955 consumers of processed meat).
- In case-control studies, they observed statistically significant between consumers and non-consumers of these meats (red meat, P0.02; processed meat, P

**Diverticulitis and antibiotics**

Br J Surg. 2016 Sep 30. doi: 10.1002/bjs.10309. [

**Randomized clinical trial of observational versus antibiotic treatment for a first episode of CT-proven uncomplicated acute diverticulitis.**

Daniels L<sup>1</sup>, Ünlü Ç<sup>2,3</sup>, de Korte N<sup>4</sup>, van Dieren S<sup>5</sup>, Stockmann HB<sup>6</sup>, Vrouenraets BC<sup>7</sup>, Consten EC<sup>8</sup>, van der Hoeven JA<sup>9</sup>, Eijsbouts QA<sup>4</sup>, Faneyte IF<sup>10</sup>, Bemelman WA<sup>2</sup>, Dijkgraaf MG<sup>5</sup>, Boermeester MA<sup>2</sup>; Dutch Diverticular Disease (3D) Collaborative Study Group. Collaborators (48)

**BACKGROUND:**

Antibiotics are advised in most guidelines on acute diverticulitis, despite a lack of evidence to support their routine use. This trial compared the effectiveness of a strategy with or without antibiotics for a first episode of uncomplicated acute diverticulitis.

**METHODS:**

Patients with CT-proven, primary, left-sided, uncomplicated, acute diverticulitis were included at 22 clinical sites in the Netherlands, and assigned randomly to an observational or antibiotic treatment strategy. The primary endpoint was time to recovery during 6 months of follow-up. Main secondary endpoints were readmission rate, complicated, ongoing and recurrent diverticulitis, sigmoid resection and mortality. Intention-to-treat and per-protocol analyses were done.

**RESULTS:**

A total of 528 patients were included. Median time to recovery was 14 (i.q.r. 6-35) days for the observational and 12 (7-30) days for the antibiotic treatment strategy, with a hazard ratio for recovery of 0.91 (lower limit of 1-sided 95 per cent c.i. 0.78; P=0.151). No significant differences between the observation and antibiotic treatment groups were found for secondary endpoints: complicated diverticulitis (3.8 versus 2.6 per cent respectively; P=0.377), ongoing diverticulitis (7.3 versus 4.1 per cent; P=0.183), recurrent diverticulitis (3.4 versus 3.0 per cent; P=0.494), sigmoid resection (3.8 versus 2.3 per cent; P=0.323), readmission (17.6 versus 12.0 per cent; P=0.148), adverse events (48.5 versus 54.5 per cent; P=0.221) and mortality (1.1 versus 0.4 per cent; P=0.432). Hospital stay was significantly shorter in the observation group (2 versus 3 days; P=0.006). Per-protocol analyses were concordant with the intention-to-treat analyses.

**CONCLUSION:**

Observational treatment without antibiotics did not prolong recovery and can be considered appropriate in patients with uncomplicated diverticulitis.

## Natural medications for acid reflux

### **Efficacy and safety of a natural remedy for the treatment of gastroesophageal reflux: A double-blinded randomized-controlled study**

Evidence-based Complementary and Alternative Medicine, 10/13/2016

Alecci U, et al.

**T**his double-blinded randomized-controlled study intended to evaluate the efficacy and safety of a natural remedy for the treatment of gastroesophageal reflux. This study emphasizes that for reducing the frequency and intensity of symptoms associated with gastroesophageal reflux, Mucosave formulation provides an effective and well-tolerated treatment.

#### Methods

- A randomized double-blinded controlled clinical study was designed to assess the efficacy and the safety of a formulation based on sodium alginate/bicarbonate in combination with extracts obtained from *Opuntia ficus-indica* and *Olea europaea* associated with polyphenols (Mucosave; verum), on GER-related symptoms.
- They treated male/female 118 (intention to treat) subjects with moderate GER and having at least 2 to 6 days of GER episodes/week with verum (6 g/day) or placebo for 2 months.
- Before the treatment and at the end of the treatment, the questionnaires Gastroesophageal Reflux Disease-Health-Related Quality of Life (GERD-HRQoL) and Gastroesophageal Reflux Disease Symptom Assessment Scale (GSAS) were self-administered by participants.

#### Results

- As compare to placebo, verum produced statistically significant reduction of GERD-HRQoL and GSAS scores, -56.5% and -59.1%, respectively.
- The study reveals that heartburn and acid regurgitation episodes for week were significantly reduced by verum ( $p < 0.01$ ).

### Inflammatory cells

Curr Allergy Asthma Rep. 2016 Oct;16(10):73. doi: 10.1007/s11882-016-0652-3.

#### **Dysregulation of Group 3 Innate Lymphoid Cells in the Pathogenesis of Inflammatory Bowel Disease.**

Forkel M<sup>1</sup>, Mjösberg J<sup>2</sup>.

#### ***PURPOSE OF REVIEW:***

Here, we review recent literature indicating a role of innate lymphoid cells in human inflammatory bowel disease with a focus on the plastic population of ILC3.

#### ***RECENT FINDINGS:***

Many studies suggest an involvement of ILC3 in human intestinal inflammation. ILC3 present the most abundant ILC subtype in the human intestine at steady state. In IBD, this composition is skewed towards ILCs showing an ILC1 phenotype and cytokine profile. This change is likely due to the microenvironment causing skewing of the functionally plastic ILC subsets. Interactions between ILCs and other cells are important to keep homeostasis and intestinal barrier integrity. The knowledge about the involvement of ILCs in IBD is rapidly increasing, and with the help of mouse models, new pathways and functions of ILCs are continuously unraveled. In the majority of human studies, a potential role for ILCs in Crohn's disease is found. However, less data is available for a possible role in ulcerative colitis.

Results from mice are obtained from diverse model systems, and more research in this field is needed to clarify and integrate the current knowledge in order to improve treatment strategies for IBD patients.

## Fatty liver disease

**Association between rice, bread, and noodle intake and the prevalence of non-alcoholic fatty liver disease in Japanese middle-aged men and women**

Ryoko Tajima Takeshi Kimura Ayaka Enomoto Kaede Yanoshita Aki Saito Satomi Kobayashi,  
Katsunori Masuda Kaoruko Iida, MD, PhD

DOI: <http://dx.doi.org/10.1016/j.clnu.2016.09.034>

**Abstract****Background & Aims**

Prevention of non-alcoholic fatty liver disease (NAFLD) through lifestyle modification is an important public health issue. Carbohydrate intake from soft drinks has received particular interest. Owing to differences in dietary habits, however, major contributors to the intake of dietary carbohydrates, such as rice, bread, and noodles, might have more influence on NAFLD prevalence in East Asian countries than consumption of soft drinks. We examined the relationship of the intake of rice, bread, and noodles, as well as overall carbohydrate intake, with NAFLD prevalence in middle-aged Japanese.

**Methods**

This is a cross-sectional study of 977 men and 1,467 women aged 40-69 y. Dietary information was obtained using a validated self-administered diet history questionnaire. Diagnosis of NAFLD was based on the following criteria: presence of steatosis on abdominal ultrasound, alcohol intake <20 g/day in women and <30 g/day in men, and exclusion of other liver diseases. Logistic regression was performed as multivariate analysis.

**Results**

The presence of NAFLD was 34.9% (n=341) in men and 11.7% (n=171) in women. Carbohydrate intake was positively associated with NAFLD prevalence in women (p for trend=0.008). There was also a positive association between rice intake and NAFLD prevalence in women; the multi-adjusted odds ratio for the highest versus the lowest quartiles of rice intake was 1.87 (95% CI: 1.03, 3.41; p for trend=0.006). These associations were not observed in men. No association was observed between bread and noodle intake and the prevalence of NAFLD in either sex.

**Conclusions**

Consumption of carbohydrates and rice was positively associated with NAFLD prevalence in middle-aged Japanese women.

*Keywords:*

dietary carbohydrate, starchy foods, rice intake, non-alcoholic fatty liver disease, non-alcoholic steatosis, NAFLD

### Nutrition and IBS

Curr Gastroenterol Rep. 2016 Oct;18(10):55. doi: 10.1007/s11894-016-0527-8.

#### **Nutritional Strategies in the Management of Adult Patients with Inflammatory Bowel Disease: Dietary Considerations from Active Disease to Disease Remission.**

Nguyen DL<sup>1</sup>, Limketkai B<sup>2</sup>, Medici V<sup>3</sup>, Saire Mendoza M<sup>4</sup>, Palmer L<sup>5</sup>, Bechtold M<sup>6</sup>.

Inflammatory bowel disease (IBD) is a group of chronic, lifelong, and relapsing illnesses, such as ulcerative colitis and Crohn's disease, which involve the gastrointestinal tract.

There is no cure for these diseases, but combined pharmacological and nutritional therapy can induce remission and maintain clinical remission. Malnutrition and nutritional deficiencies among IBD patients result in poor clinical outcomes such as growth failure, reduced response to pharmacotherapy, increased risk for sepsis, and mortality.

The aim of this review is to highlight the consequences of malnutrition in the management of IBD and describe nutritional interventions to facilitate induction of remission as well as maintenance; we will also discuss alternative delivery methods to improve nutritional status preoperatively.

**12 A. WHIPLASH****RNA and chronic pain****RESEARCH REPORT****MicroRNA 320a Predicts Chronic Axial and Widespread Pain Development Following Motor Vehicle Collision in a Stress-Dependent Manner**

**Authors:** Sarah D. Linnstaedt, PhD<sup>1,2</sup>, Kyle D. Riker, <sup>1,2</sup>, Margaret G. Walker, <sup>1,2</sup>, Jennifer E. Nyland, PhD<sup>3</sup>, Erin Zimny, MD<sup>4</sup>, Christopher Lewandowski, MD<sup>4</sup>, Phyllis L. Hendry, MD<sup>5</sup>, Kathia Damiron, MD<sup>6</sup>, Claire Pearson, MD<sup>7</sup>, Marc-Anthony Velilla, MD<sup>8</sup>, Jeffrey Jones, MD<sup>9</sup>, Robert A. Swor, DO<sup>10</sup>, Robert Domeier, MD<sup>11</sup>, Samuel A. McLean, MD<sup>1,2,12</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2016 **Volume:**46 **Issue:**10 **Pages:**911–919 **DOI:**10.2519/jospt.2016.6944

**Study Design**

Prospective human cohort study combined with molecular studies.

**Background**

A microRNA is a small, noncoding RNA molecule that can play a role in disease onset. Recent studies found that circulating levels of microRNA 320a (miR-320a) are associated with musculoskeletal pain conditions and that miR-320a is stress responsive.

**Objectives**

To investigate whether circulating expression levels of miR-320a in the peritraumatic period predict persistent axial musculoskeletal pain 6 months after motor vehicle collision (MVC).

**Methods**

We evaluated whether (1) circulating miR-320a and related members of the miR-320a family predict axial musculoskeletal pain and other musculoskeletal pain outcomes 6 months following MVC, and (2) miR-320a regulates stress system and pain-related transcripts in cell culture. Given the wealth of data suggesting that biological mechanisms influencing pain outcomes are often sex and/or stress dependent, interactions between miR-320a, stress, and sex were evaluated.

**Results**

In primary analyses (n = 69), a significant crossover interaction was observed between the influence of circulating miR-320a and peritraumatic distress ( $\beta = -0.01$ ,  $P = .002$ ) on post-MVC axial musculoskeletal pain. Reduced peritraumatic miR-320a expression levels predicted axial musculoskeletal pain in distressed individuals ( $\beta = -0.12$ ,  $P = .006$ ) but not nondistressed individuals. In secondary analyses, miR-320a predicted widespread musculoskeletal pain, and related members of the miR-320a family also predicted axial and widespread musculoskeletal pain. In cell culture, miR-320a bound stress and pain-associated 3'UTR transcripts (FKBP5, ADCYAP1, PER2, and NR3C1).

**Conclusion**

These data suggest that miR-320a may help mediate regional and widespread changes in pain sensitivity after MVC. *J Orthop Sports Phys Ther* 2016;46(10):911–919. doi:10.2519/jospt.2016.6944 Keyword: cervical spine, WAD, whiplash

### Meniscoids

#### Morphology of Cervical Spine Meniscoids in Individuals With Chronic Whiplash-Associated Disorder: A Case-Control Study

**Authors:** Scott F. Farrell, PT, PhD<sup>1,2</sup>, Peter G. Osmotherly, MMedSc, PhD<sup>1</sup>, Jon Cornwall, MSc, PhD<sup>3–5</sup>, Peter Lau, MBBS, FRANZCR<sup>6</sup>, Darren A. Rivett, MAppSci, PhD<sup>1</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2016 **Volume:**46 **Issue:**10 **Pages:**902–910 **DOI:**10.2519/jospt.2016.6702

#### Study Design

Case-control study.

#### Background

Cervical spine meniscoids are thought to contribute to neck pain and hypomobility in individuals with chronic whiplash-associated disorder (WAD); however, their morphology has not been studied in a clinical population.

#### Objectives

To investigate cervical spine meniscoid morphology in individuals with chronic WAD.

#### Methods

Twenty volunteers with chronic WAD (mean  $\pm$  SD age, 39.3  $\pm$  11.0 years; 10 female) and 20 age- and sex-matched controls (age, 39.1  $\pm$  10.6 years) underwent cervical spine magnetic resonance imaging. Lateral atlantoaxial and zygapophyseal joints (C2–3 to C6–7) were inspected for meniscoids. Length of meniscoid protrusion was measured and composition (adipose/fibrous/fibro adipose) assessed. Data were analyzed using Wilcoxon signed-rank tests and linear and logistic regression ( $P < .05$ ).

#### Results

Meniscoids were identified in the chronic WAD ( $n = 317$ ) and control ( $n = 296$ ) groups. At the lateral atlantoaxial joints, median meniscoid length was greater in the control group (ventral, 6.07 mm; dorsal, 7.24 mm) than the WAD group (ventral, 5.01 mm;  $P = .06$  and dorsal, 6.48 mm;  $P < .01$ ). At the dorsal aspect of zygapophyseal joints, meniscoids were more frequently fibrous in the chronic WAD group (odds ratio = 2.38,  $P < .01$ ; likelihood ratio test:  $\chi^2_2$ , 9.02;  $P = .01$ ).

#### Conclusion

In individuals with chronic WAD, lateral atlantoaxial meniscoids were shorter and dorsal cervical zygapophyseal meniscoids were more fibrous, suggesting alterations in meniscoid composition. This may have pathoanatomical implications in chronic WAD. *J Orthop Sports Phys Ther* 2016;46(10):902–910. Epub 3 Sep 2016. doi:10.2519/jospt.2016.6702

Keyword: atlantoaxial joint, magnetic resonance imaging, neck, synovial fold, zygapophyseal joint

**Comparisons to chronic pain sufferers**

J Orthop Sports Phys Ther. 2016 Oct;46(10):894-901. Epub 2016 Sep 3.

**Are People With Whiplash-Associated Neck Pain Different From People With Nonspecific Neck Pain?**

Anstey R, Kongsted A, Kamper S, Hancock MJ.

**Study Design** Secondary analysis of a prospective cohort study with cross-sectional and longitudinal analyses.

**Background** The clinical importance of a history of whiplash-associated disorder (WAD) in people with neck pain remains uncertain.

**Objective** To compare people with WAD to people with nonspecific neck pain, in terms of their baseline characteristics and pain and disability outcomes over 1 year. **Methods** Consecutive patients with neck pain who presented to a secondary-care spine center answered a comprehensive self-report questionnaire and underwent a physical examination. Patients were classified into a group of either those with WAD or those with nonspecific neck pain. We compared the outcomes of baseline characteristics of the 2 groups, as well as pain intensity and activity limitation at follow-ups of 6 and 12 months.

**Results** A total of 2578 participants were included in the study. Of these, 488 (19%) were classified as having WAD. At presentation, patients with WAD were statistically different from patients without WAD for almost all characteristics investigated. While most differences were small (1.1 points on an 11-point pain-rating scale and 11 percentage points on the Neck Disability Index), others, including the presence of dizziness and memory difficulties, were substantial. The between-group differences in pain and disability increased significantly ( $P < .001$ ) over 12 months. At 12-month follow-up, the patients with WAD had on average approximately 2 points more pain and 17 percentage points more disability than those with nonspecific neck pain.

**Conclusion** People referred to secondary care with WAD typically had more self-reported pain and disability and experienced worse outcomes than those with nonspecific neck pain. Caution is required when interpreting the longitudinal outcomes due to lower-than-optimal follow-up rates. **Level of Evidence** Prognosis, level 2. J Orthop Sports Phys Ther 2016;46(10):894-901. Epub 3 Sep 2016. doi:10.2519/jospt.2016.6588.

**Multifidus fat infiltration**

J Orthop Sports Phys Ther. 2016 Oct;46(10):886-893. Epub 2016 Sep 2.

**An Investigation of Fat Infiltration of the Multifidus Muscle in Patients With Severe Neck Symptoms Associated With Chronic Whiplash-Associated Disorder.**

Karlsson A, Leinhard OD, Åslund U, West J, Romu T, Smedby Ö, Zsigmond P, Peolsson A.

Study Design Cross-sectional study.

Background Findings of fat infiltration in cervical spine multifidus, as a sign of degenerative morphometric changes due to whiplash injury, need to be verified.

Objectives To develop a method using water/fat magnetic resonance imaging (MRI) to investigate fat infiltration and cross-sectional area of multifidus muscle in individuals with whiplash-associated disorders (WADs) compared to healthy controls.

Methods Fat infiltration and cross-sectional area in the multifidus muscles spanning the C4 to C7 segmental levels were investigated by manual segmentation using water/fat-separated MRI in 31 participants with WAD and 31 controls, matched for age and sex.

Results Based on average values for data spanning C4 to C7, participants with severe disability related to WAD had 38% greater muscular fat infiltration compared to healthy controls ( $P = .03$ ) and 45% greater fat infiltration compared to those with mild to moderate disability related to WAD ( $P = .02$ ). There were no significant differences between those with mild to moderate disability and healthy controls. No significant differences between groups were found for multifidus cross-sectional area. Significant differences were observed for both cross-sectional area and fat infiltration between segmental levels.

**Conclusion** Participants with severe disability after a whiplash injury had higher fat infiltration in the multifidus compared to controls and to those with mild/moderate disability secondary to WAD. Earlier reported findings using T1-weighted MRI were reproduced using refined imaging technology. The results of the study also indicate a risk when segmenting single cross-sectional slices, as both cross-sectional area and fat infiltration differ between cervical levels. J Orthop Sports Phys Ther 2016;46(10):886-893. Epub 2 Sep 2016. doi:10.2519/jospt.2016.6553.

**Concussions and whiplash**

J Orthop Sports Phys Ther. 2016 Oct;46(10):874-885.

**Whiplash Injury or Concussion? A Possible Biomechanical Explanation for Concussion Symptoms in Some Individuals Following a Rear-End Collision.**

Elkin BS, Elliott JM, Siegmund GP.

Study Design Finite element modeling of experimental data.

**Background** The clinical presentations of whiplash injury and concussion have considerable overlap. Both diagnoses are generally based on presenting signs and symptoms, and a history of neck or head trauma. With incomplete knowledge of the trauma, differentiating between whiplash injury and concussion can be clinically challenging.

**Objectives** To estimate the brain strains that develop during rear-end car crashes, evaluate how these strains vary with different head kinematic parameters, and compare these strains to those generated during potentially concussive football helmet impacts.

**Methods** Head kinematic data were analyzed from 2 prior studies, one that focused on head restraint impacts in rear-end crash tests and another that focused on football helmet impacts. These data were used as inputs to a finite element model of the human brain. Brain strains were calculated and compared to different peak kinematic parameters and between the 2 impact conditions.

**Results** Brain strains correlated best with the head's angular velocity change for both impact conditions. The 4 crashes with head angular velocity changes greater than 30 rad/s (greater than 1719°/s) generated the highest brain strains. One crash, in which the head wrapped onto the top of the head restraint, generated brain strains similar to a 9.3-m/s rear football helmet impact, a level previously associated with concussion.

**Conclusion** This work provides new insight into a potential biomechanical link between whiplash injury and concussion, and advances our understanding of how head restraint interaction during a rear-end crash may cause an injury more typically associated with sports-related head impacts. J Orthop Sports Phys Ther 2016;46(10):874-885. doi:10.2519/jospt.2016.7049.

### Recovery pathways

J Orthop Sports Phys Ther. 2016 Oct;46(10):851-861. Epub 2016 Sep 3.

#### **Recovery Pathways and Prognosis After Whiplash Injury.**

Ritchie C, Sterling M.

**Synopsis** Recovery from a whiplash injury is varied and complex. Some individuals recover quickly and fully, while others experience ongoing pain and disability. Three distinct patterns of predicted recovery (trajectories) have been identified using disability and psychological outcome measures. These trajectories are not linear, and show that recovery, if it is going to occur, tends to happen within the first 3 months of the injury, with little improvement after this period. Identification of factors associated with poor recovery is accumulating, and since 2000 there have been at least 10 published systematic reviews on prognostic factors for whiplash-associated disorder.

Poor recovery has been consistently reported to be associated with high initial neck pain intensity and neck-related disability, posttraumatic stress symptoms, pain catastrophizing, and, to a lesser extent, low self-efficacy and cold hyperalgesia. Evidence regarding factors, including compensation status, psychological factors, structural pathology, and preinjury health status, remains equivocal. Given the huge number of predictive factors and various interpretations of recovery, adapting these data for use in clinical practice is difficult. Tools such as clinical prediction rules (CPRs), by statistically quantifying relevant data, may help to predict the probability of diagnosis, prognosis, or response to treatment.

Numerous CPRs have been derived for individuals with whiplash; however, to date, only 3 prognostic CPRs have undergone external validation, and none have yet undergone impact analysis, a necessary step in providing information about the rules' ability to improve clinically relevant outcomes.

J Orthop Sports Phys Ther 2016;46(10):851-861. Epub 3 Sep 2016. doi:10.2519/jospt.2016.6918.

**Impact of whiplash**

J Orthop Sports Phys Ther. 2016 Oct;46(10):826-833. Epub 2016 Sep 3.

**Mechanisms and Mitigation of Head and Spinal Injuries Due to Motor Vehicle Crashes.**

Ivancic PC.

**Abstract**

Synopsis Head and spinal injuries commonly occur during motor vehicle crashes (MVCs).

The goal of this clinical commentary is to discuss real-life versus simulated MVCs and to present clinical, biomechanical, and epidemiological evidence of MVC-related injury mechanisms. It will also address how this knowledge may guide and inform the design of injury mitigation devices and assist in clinical decision making.

Evidence indicates that there exists no universal injury tolerance applicable to the entire population of the occupants of MVCs. Injuries sustained by occupants depend on a number of factors, including occupant characteristics (age, height, weight, sex, bone mineral density, and pre-existing medical and musculoskeletal conditions), pre-MVC factors (awareness of the impending crash, occupant position, usage of and position of the seatbelt and head restraint, and vehicle specifications), and MVC-related factors (crash orientation, vehicle dynamics, type of active or passive safety systems, and occupant kinematic response). Injuries resulting from an MVC occur due to blunt impact and/or inertial loading. An S-shaped curvature of the cervical spine and associated injurious strains have been documented during rear-, frontal-, and side-impact MVCs.

Data on the injury mechanism and the quantification of spinal instability guide and inform the emergent and subsequent conservative or surgical care. Such care may require determining optimal patient positioning during transport, which injuries may be treated conservatively, whether reduction should be performed, optimal patient positioning intraoperatively, and whether bracing should be worn prior to and/or following surgery.

The continued improvement of traditional injury mitigation systems, such as seats, seatbelts, airbags, and head restraints, together with research of newer collision-avoidance technologies, will lead to safer motor vehicles and ultimately more effective injury management strategies.

J Orthop Sports Phys Ther 2016;46(10):826-833. Epub 3 Sep 2016. doi:10.2519/jospt.2016.6716.

**KEYWORDS:**

biomechanics; epidemiology; prevention; whiplash

### 13. CRANIUM/TMJ

#### Insomnia

#### Internet-based cognitive behavioral therapy for insomnia: A health economic evaluation

SLEEP, 10/10/2016

Thiart H, et al.

Researchers conducted this study to assess the cost-effectiveness and cost-benefit of providing Internet-based cognitive behavioral therapy for insomnia (iCBT-I) to symptomatic employees from the employer's perspective. The results demonstrate that concentrating on sleep improvement using iCBT-I might be a cost-effective strategy in occupational health care.

#### Methods

- In this study, school teachers (N = 128) with clinically significant insomnia symptoms and work-related rumination were randomized to guided iCBT-I or a waitlist-control-group, both with access to treatment as usual.
- Economic data were gathered at baseline and 6-mo follow-up.
- The authors conducted (1) a cost-effectiveness analysis with treatment response (Reliable Change [decline of 5.01 points] and Insomnia Severity Index < 8 at 6-month follow-up) as the outcome and (2) a cost-benefit analysis.
- Since both analyses were performed from the employer's perspective, they concentrated specifically on absenteeism and presenteeism costs.
- Statistical uncertainty was assessed utilizing bootstrapping.

#### Results

- According to the outcomes of this work, assuming intervention costs of €200 (\$245), cost-effectiveness analyses demonstrated that at a willingness-to-pay of €0 for each positive treatment response, there is an 87% probability that the intervention is more cost effective than treatment as usual alone.
- Cost-benefit analyses led to a net benefit of €418 (95% confidence interval: -593.03 to 1,488.70) (\$512) per participant and a return on investment of 208% (95% confidence interval: -296.52 to 744.35).
- Results revealed that the lessening in costs was mainly driven by the effects of the intervention on presenteeism and to a lesser degree by diminished absenteeism.

**14. HEADACHES****HA and balance disorders**

Laryngoscope. 2016 Oct 12. doi: 10.1002/lary.26299.

**Management of mal de débarquement syndrome as vestibular migraines.**

Ghavami Y<sup>1</sup>, Haidar YM<sup>1</sup>, Ziai KN<sup>1</sup>, Moshtaghi O<sup>1</sup>, Bhatt J<sup>1</sup>, Lin HW<sup>1</sup>, Djalilian HR<sup>2,3</sup>.

**OBJECTIVE:**

Mal de débarquement syndrome (MdDS) is a balance disorder that typically starts after an extended exposure to passive motion, such as a boat or plane ride. Management is typically supportive (e.g. physical therapy), and symptoms that persist beyond 6 months have been described as unlikely to remit. This study was conducted to evaluate the response of patients with MdDS to management with migraine prophylaxis, including lifestyle changes and medical therapy.

**STUDY DESIGN:**

Prospective review.

**SETTING:**

Ambulatory setting at a tertiary care medical center.

**METHODS:**

Clinical history, detailed questionnaires, and audiograms were used to diagnose patients with MdDS. Those patients with the diagnosis of the MdDS were placed on our institutional vestibular migraine management protocol. Treatment response was assessed with a quality-of-life (QOL) survey and visual analog scale.

**RESULTS:**

Fifteen patients were diagnosed with MdDS, with a predominance of females (73%) and a mean age of 50 ± 13 years. Eleven patients (73%) responded well to management with a vestibular migraine protocol, which included lifestyle changes, as well as pharmacotherapy with verapamil, nortriptyline, topiramate, or a combination thereof. In comparison, a retrospective control group of 17 patients demonstrated a lower rate of improvement when treated with vestibular rehabilitation and physical therapy.

**CONCLUSION:**

Management of MdDS as vestibular migraine can improve patients' symptoms and increase the QOL. Nearly all the patients suffering from MdDS had a personal or family history of migraine headaches or had signs or symptoms suggestive of atypical migraine.

**LEVEL OF EVIDENCE:**

4 Laryngoscope, 2016.

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**KEYWORDS:**

MdDS; mal de débarquement syndrome; quality of life; vestibular migraine

## Hypothyroidism and HA

Headache. 2016 Sep 27. doi: 10.1111/head.12943.

### **Headache Disorders May Be a Risk Factor for the Development of New Onset Hypothyroidism.**

Martin AT<sup>1</sup>, Pinney SM<sup>1</sup>, Xie C<sup>1</sup>, Herrick RL<sup>1</sup>, Bai Y<sup>1</sup>, Buckholz J<sup>1</sup>, Martin VT<sup>2</sup>.

#### **OBJECTIVE:**

To determine whether headache disorders are a risk factor for the development of new onset hypothyroidism.

#### **BACKGROUND:**

Past studies have reported associations between headache disorders and hypothyroidism, but the directionality of the association is unknown.

#### **METHODS:**

This was a longitudinal retrospective cohort study using data from the Fernald Medical Monitoring Program (FMMP). Residents received physical examinations and thyroid function testing every 3 years during the 20 year program. Residents were excluded from the cohort if there was evidence of past thyroid disease or abnormal thyroid function tests at the first office visit. A diagnosis of a headache disorder was established by self-report of "frequent headaches," use of any headache-specific medication, or a physician diagnosis of a headache disorder. The primary outcome measure was new onset hypothyroidism defined as the initiation of thyroid replacement therapy or TSH  $\geq 10$  without thyroid medication. A Cox survival analysis with time dependent variables were used for the model. Headache disorders, age, sex, body mass index, income, smoking, narcotic use, and hypothyroidism-producing medications were independent variables in the model.

#### **RESULTS:**

Data from 8412 residents enrolled in the FMMP were used in the current study. Headache disorders were present in about 26% of the residents and new onset hypothyroidism developed in ~7%. The hazard ratio for the development of new onset hypothyroidism was 1.21 (95% CI = 1.001, 1.462) for those with headache disorders.

#### **CONCLUSIONS:**

Headache disorders may be associated with an increased risk for the development of new onset hypothyroidism.

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**Somatosensory changes**

Headache. 2016 Oct;56(9):1439-1447. doi: 10.1111/head.12947. Epub 2016 Sep 16.

**Chronic Migraine Is Associated With Sustained Elevation of Somatosensory Temporal Discrimination Thresholds.**

Vuralli D<sup>1,2</sup>, Evren Boran H<sup>1,2</sup>, Cengiz B<sup>3</sup>, Coskun O<sup>1</sup>, Bolay H<sup>4,5</sup>.

**BACKGROUND AND OBJECTIVE:**

Migraine headache attacks have been shown to be accompanied by significant prolongation of somatosensory temporal discrimination threshold values, supporting signs of disrupted sensorial processing in migraine. Chronic migraine is one of the most debilitating and challenging headache disorders with no available biomarker. We aimed to test the diagnostic value of somatosensory temporal discrimination for chronic migraine in this prospective, controlled study.

**METHODS:**

Fifteen chronic migraine patients and 15 healthy controls completed the study. Chronic migraine patients were evaluated twice, during a headache and headache-free period. Somatosensory temporal discrimination threshold values were evaluated in both hands. Duration of migraine and chronic migraine, headache intensity, clinical features accompanying headache such as nausea, photophobia, phonophobia and osmophobia, and pressure pain thresholds were also recorded.

**RESULTS:**

In the chronic migraine group, somatosensory temporal discrimination threshold values on the headache day ( $138.8 \pm 21.8$  ms for the right hand and  $141.2 \pm 17.4$  ms for the left hand) were significantly higher than somatosensory temporal discrimination threshold values on the headache free day ( $121.5 \pm 13.8$  ms for the right hand and  $122.8 \pm 12.6$  ms for the left hand,  $P = .003$  and  $P < .0001$ , respectively) and somatosensory temporal discrimination thresholds of healthy volunteers ( $35.4 \pm 5.5$  ms for the right hand and  $36.4 \pm 5.4$  ms for the left hand,  $P < .0001$  and  $P < .0001$ , respectively). Somatosensory temporal discrimination threshold values of chronic migraine patients on the headache free day were significantly prolonged compared to somatosensory temporal discrimination threshold values of the control group ( $121.5 \pm 13.8$  ms vs  $35.4 \pm 5.5$  ms for the right hand,  $P < .0001$  and  $122.8 \pm 12.6$  ms vs  $36.4 \pm 5.4$  ms for the left hand,  $P < .0001$ ). Somatosensory temporal discrimination threshold values of the hand contralateral to the headache lateralization ( $153.3 \pm 13.7$  ms) were significantly higher ( $P < .0001$ ) than the ipsilateral hand ( $118.2 \pm 11.9$  ms) in chronic migraine patients when headache was lateralized. The headache intensity of chronic migraine patients rated with visual analog score was positively correlated with the contralateral somatosensory temporal discrimination threshold values.

**CONCLUSION:**

Somatosensory temporal discrimination thresholds persist elevated during the headache-free intervals in patients with chronic migraine. By providing evidence for the first time for unremitting disruption of central sensory processing, somatosensory temporal discrimination test stands out as a promising neurophysiological biomarker for chronic migraine.

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**KEYWORDS:**

biomarker; chronic migraine; diagnosis; neurophysiology; somatosensory temporal discrimination

PMID: 27634554

**Manips and HA**

Eur J Neurol. 2016 Oct 2. doi: 10.1111/ene.13166.

**Chiropractic spinal manipulative therapy for migraine: a three-armed, single-blinded, placebo, randomized controlled trial.**

Chaibi A<sup>1,2</sup>, Benth JS<sup>3,4</sup>, Tuchin PJ<sup>5</sup>, Russell MB<sup>6,3</sup>.

**BACKGROUND AND PURPOSE:**

To investigate the efficacy of chiropractic spinal manipulative therapy (CSMT) for migraineurs.

**METHODS:**

This was a prospective three-armed, single-blinded, placebo, randomized controlled trial (RCT) of 17 months duration including 104 migraineurs with at least one migraine attack per month. The RCT was conducted at Akershus University Hospital, Oslo, Norway. Active treatment consisted of CSMT, whereas placebo was a sham push manoeuvre of the lateral edge of the scapula and/or the gluteal region. The control group continued their usual pharmacological management. The RCT consisted of a 1-month run-in, 3 months intervention and outcome measures at the end of the intervention and at 3, 6 and 12 months follow-up. The primary end-point was the number of migraine days per month, whereas secondary end-points were migraine duration, migraine intensity and headache index, and medicine consumption.

**RESULTS:**

Migraine days were significantly reduced within all three groups from baseline to post-treatment ( $P < 0.001$ ). The effect continued in the CSMT and placebo group at all follow-up time points, whereas the control group returned to baseline. The reduction in migraine days was not significantly different between the groups ( $P > 0.025$  for interaction). Migraine duration and headache index were reduced significantly more in the CSMT than the control group towards the end of follow-up ( $P = 0.02$  and  $P = 0.04$  for interaction, respectively). Adverse events were few, mild and transient. Blinding was strongly sustained throughout the RCT.

**CONCLUSIONS:**

It is possible to conduct a manual-therapy RCT with concealed placebo. The effect of CSMT observed in our study is probably due to a placebo response.

## HA's and diet

Curr Neurol Neurosci Rep. 2016 Nov;16(11):101.

### **Headaches: a Review of the Role of Dietary Factors.**

Zaeem Z<sup>1</sup>, Zhou L<sup>1</sup>, Dilli E<sup>2</sup>.

Dietary triggers are commonly reported by patients with a variety of headaches, particularly those with migraines.

The presence of any specific dietary trigger in migraine patients varies from 10 to 64 % depending on study population and methodology. Some foods trigger headache within an hour while others develop within 12 h post ingestion. Alcohol (especially red wine and beer), chocolate, caffeine, dairy products such as aged cheese, food preservatives with nitrates and nitrites, monosodium glutamate (MSG), and artificial sweeteners such as aspartame have all been studied as migraine triggers in the past.

This review focuses the evidence linking these compounds to headache and examines the prevalence of these triggers from prior population-based studies. Recent literature surrounding headache related to fasting and weight loss as well as elimination diets based on serum food antibody testing will also be summarized to help physicians recommend low-risk, non-pharmacological adjunctive therapies for patients with debilitating headaches.

**27. HIP****Bursae****Beyond the Greater Trochanter: A Pictorial Review of the Pelvic Bursae**

Michael V Friedman J Derek Stensby Jeremiah R Long Stephen A Currie Travis J Hillen

DOI: <http://dx.doi.org/10.1016/j.clinimag.2016.09.010>

**Abstract****Purpose**

Review the MRI appearance of different bursae located throughout the pelvis, including the pertinent osseous and musculotendinous anatomy.

**Materials and Methods**

Bursae are potential spaces that reduce friction between opposed moving components which can become inflamed, clinically mimicking internal derangement.

**Results**

This series illustrates the most common as well as lesser-known pelvic bursae. Common causes of bursitis including overuse, trauma, and infection are presented.

**Conclusion**

Multiple bursae are located throughout the pelvis. It is important for radiologists to recognize bursitis as a potential etiology of pain, and be familiar with their anatomical locations in order to guide appropriate management.

*keywords:*

Musculoskeletal, Magnetic Resonance, Bursitis, Pelvis

**29. OA****Cam and hip OA**

Arthritis Rheumatol. 2016 Oct 1. doi: 10.1002/art.39929.

**Cam deformity and acetabular dysplasia as risk factors for hip osteoarthritis.**

Hosnijeh FS<sup>1</sup>, Zuidervijk ME<sup>2</sup>, Versteeg M<sup>2</sup>, Smeele HT<sup>2</sup>, Hofman A<sup>3</sup>, Uitterlinden AG<sup>2</sup>, Agricola R<sup>4</sup>, Oei EH<sup>5</sup>, Waarsing JH<sup>4</sup>, Bierma-Zeinstra SM<sup>4,6</sup>, van Meurs JB<sup>2</sup>.

**Objectives** Cam deformity and acetabular dysplasia have been recognized as relevant risk factors for hip osteoarthritis (OA) in a few prospective studies with limited sample sizes. However, to date, there is no evidence available from prospective studies if the magnitude of these associations differ by gender, body mass index (BMI), and age.

**Methods** Participants of Rotterdam Study cohort including men and women aged 55 years or older without OA at baseline (n=4438) and mean follow-up of 9.2 years were included in the study. Incident radiographic OA was defined as a Kellgren and Lawrence grade of  $\geq 2$  or a total hip replacement at follow-up. Alpha and center-edge angles were measured to determine the presence of cam deformity and acetabular dysplasia/pincer deformity, respectively. Odds ratios were calculated to assess the associations between both deformities and OA development.

**Results** Individuals with cam deformity (OR=2.11, 95% CI=1.55-2.87,  $p < 0.0001$ ) and acetabular dysplasia (OR=2.19, 95% CI=1.50-3.21,  $p < 0.0001$ ) had a two-fold increased risk for developing OA compared with individuals without deformity, while pincer deformity did not increase the risk of OA. Stratification analyses showed that the association between cam deformity and acetabular dysplasia and OA were driven by the younger individuals, whereas BMI did not influence the associations. The females drove the association between dysplasia and OA.

**Conclusion** Individuals with cam deformity and acetabular dysplasia are predisposed to OA independently from other well-known risk factors. Interestingly, both deformities were only predisposing to OA in relatively young individuals. Therefore, early identification of these conditions is important. This article is protected by copyright. All rights reserved.

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**KEYWORDS:**

Acetabular dysplasia; Alpha angle; CE angle; Cam deformity; Hip osteoarthritis

## 30 A. IMPINGEMENT

### Pelvic rotation

#### **Pelvic Rotation in Femoroacetabular Impingement Is Decreased Compared to Other Symptomatic Hip Conditions**

**Authors:** Daniel Camara Azevedo, PT, MSc<sup>1</sup>, Edson Barreto Paiva, MD<sup>2</sup>, Alexia Moura Abuhid Lopes, MD<sup>3</sup>, Henrique de Oliveira Santos, PT<sup>1</sup>, Ricardo Luiz Carneiro, PT, MSc<sup>1,4</sup>, André Soares Rodrigues, MD<sup>2</sup>, Marco Antonio Percope de Andrade, MD, PhD<sup>5</sup>, Eduardo N. Novais, MD<sup>6</sup>, Linda R. Van Dillen, PT, PhD<sup>7</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2016 **Volume:**0 **Issue:**0 **Pages:**1–

- **DOI:**10.2519/jospt.2016.6713

#### **Study Design**

Cross-sectional, case-control design.

#### **Background**

Pelvic movement has been considered a possible discriminating parameter associated with FAI symptom onset. Decreased pelvic rotation has been found during squatting in people with FAI when compared to hip-healthy people. However, it is possible that changes in pelvic movement may occur in other hip conditions because of pain and may not be specific to FAI.

#### **Objectives**

To compare sagittal pelvic rotation during hip flexion and in sitting between people with Femoroacetabular Impingement (FAI) and people with other symptomatic hip conditions.

#### **Methods**

Thirty people with symptomatic FAI, 30 people with other symptomatic hip conditions, and 20 hip-healthy people participated in the study. Sagittal pelvic rotation was calculated based on measures of pelvic alignment in standing, hip flexion to 45° and 90°, and sitting.

#### **Results**

There were significant differences in sagittal pelvic rotation among the three groups in all conditions ( $P_s < 0.05$ ). Post-hoc analyses revealed that participants in the symptomatic FAI group had less pelvic rotation during hip flexion to 45° and 90° compared to participants in the other symptomatic hip conditions group and hip-healthy group (mean difference = 1.2° to 1.9°). In sitting, participants in the other symptomatic hip conditions group had less posterior pelvic rotation compared to the hip-healthy group (mean difference = 3.9°).

#### **Conclusion**

People with symptomatic FAI have less posterior pelvic rotation during hip flexion when compared to people with other symptomatic hip conditions and hip-healthy people.

**Level of Evidence** Symptom prevalence, level 4. *J Orthop Sports Phys Ther*, Epub 29 Sep 2016. doi:10.2519/jospt.2016.6713 **Keyword:** articular, lumbopelvic, pelvifemoral rhythm, pelvis, physical examination, range of motion

### PT management

### Management of a Patient With Acute Acetabular Labral Tear and Femoral Acetabular Impingement With Intra-articular Steroid Injection and a Neuromotor Training Program

**Authors:** Joel Narveson, PT, DPT<sup>1,2</sup>, Matthew D. Haberl, PT, DPT<sup>2</sup>, Patrick J. Grabowski, PT, PhD<sup>1</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2016 **Volume:**0 **Issue:**0 **Pages:**1–43 **DOI:**10.2519/jospt.2016.6573

### Study Design

Case report.

### Background

Intra-articular hip pathologies can be difficult to diagnose, and evidence to guide physical therapy interventions is lacking. The purpose of this report is to describe a clinical pathway for conservative management of a patient with an acute acetabular labral tear (ALT) and femoroacetabular impingement (FAI).

### Case Description

The patient was an 18-year-old woman with recent onset of right groin pain who underwent intra-articular corticosteroid injection and therapeutic exercise for the management of an acute ALT identified on radiographic imaging. Prior to physical therapy, the patient received an intra-articular hip injection for diagnostic purposes and pain relief. Upon initial evaluation the patient presented with improved pain, however, continued kinesthetic deficits, inflexibility, muscle imbalances, and reproduction of symptoms with end range hip motions. A physical therapy plan was implemented using neuromuscular re-education to address her continued impairments.

### Outcomes

Marked improvements were noted at discharge and 6-month follow-up for pain, strength, and function as demonstrated on the Patient-Specific Functional Scale, Global Rating of Change Scale, and international Hip Outcome Tool-33.

### Discussion

This case demonstrates a clinical pathway for collaborative medical management of a patient with confirmed intra-articular pathology. Details illustrate the clinical reasoning and rationale used to guide the clinical decision making process.

### Level of Evidence

Therapy, level 4. *J Orthop Sports Phys Ther*, Epub 29 Sep 2016. doi:10.2519/jospt.2016.6573

**Keyword:** exercise, hip pain, injection, neuromuscular control, physical therapy

**31. KNEE****Knee pain and ex**

Arthritis Care Res (Hoboken). 2016 Oct 1. doi: 10.1002/acr.23104.

**The relationship between attitudes, beliefs and physical activity in older adults with knee pain: secondary analysis of a randomised controlled trial.**

Quicke DJ<sup>1</sup>, Foster PN<sup>2</sup>, Ogollah DR<sup>2</sup>, Croft PP<sup>2</sup>, Holden DM<sup>2</sup>.

**Objective** To investigate how attitudes and beliefs about exercise relate to physical activity behaviour in older adults with knee pain attributable to osteoarthritis (OA).

**Design** Secondary data analyses of a randomised controlled trial of exercise interventions (ISRCTN 93634563). Participants were adults over 45 years old with knee pain attributable to OA (n=514). Crude and adjusted cross-sectional and longitudinal associations between baseline i) Self-Efficacy for Exercise (SEE), ii) Positive Outcome Expectations for Exercise (POEE), iii) Negative Outcome Expectations for Exercise (NOEE) and physical activity level at baseline, 3 and 6 months follow-up (measured by the self-report Physical Activity Scale for the Elderly (PASE)) and important increase in physical activity level (from baseline to 6 month follow-up) were investigated using multiple linear and logistic regression.

**Results** Cross-sectional associations were found between SEE and PASE  $\beta= 4.14$  (95% Confidence Interval 0.26, 8.03) and POEE and PASE  $\beta= 16.71$  (1.87, 31.55) adjusting for sociodemographic and clinical covariates. Longitudinal associations were found between baseline SEE and PASE at 3 months  $\beta= 4.95$  (1.02, 8.87) and 6 months  $\beta= 3.71$  (0.26, 7.16), and baseline POEE and PASE at 3 months  $\beta= 34.55$  (20.13, 48.97) and 6 months  $\beta= 25.74$  (11.99, 39.49) adjusting for baseline PASE score and intervention arm. However, no significant associations with important increase in physical activity level were found.

**Conclusions** Higher exercise self-efficacy and more positive exercise outcome expectations were associated with higher current and future physical activity levels. These may be targets for interventions aimed at increasing levels of physical activity. This article is protected by copyright. All rights reserved.

### 34. PATELLA

#### Morphology and OA

Clin Imaging. 2016 Sep 28;41:7-10. doi: 10.1016/j.clinimag.2016.09.008.

#### **Association between trochlear morphology and chondromalacia patella: an MRI study.**

Duran S<sup>1</sup>, Cavusoglu M<sup>2</sup>, Kocadal O<sup>3</sup>, Sakman B<sup>4</sup>.

This study aimed to compare trochlear morphology seen in magnetic resonance imaging between patients with chondromalacia patella and age-matched control patients without cartilage lesion.

Trochlear morphology was evaluated using the lateral trochlear inclination, medial trochlear inclination, sulcus angle and trochlear angle on the axial magnetic resonance images.

Consequently, an association between abnormal trochlear morphology and chondromalacia patella was identified in women. In particular, women with flattened lateral trochlea are at an increased risk of patellar cartilage structural damage.

**OA of Patella**

Arthritis Care Res (Hoboken). 2016 Oct 1. doi: 10.1002/acr.23110.

**Clinical significance of medial vs. lateral compartment patellofemoral osteoarthritis: cross-sectional analyses in an adult population with knee pain.**

Ukachukwu V<sup>1,2</sup>, Duncan R<sup>3</sup>, Belcher J<sup>1</sup>, Marshall M<sup>1</sup>, Stefanik J<sup>4</sup>, Crossley K<sup>5</sup>, Thomas MJ<sup>1</sup>, Peat G<sup>6</sup>.

**Objective** To determine the comparative prevalence, associations with selected patient characteristics and clinical outcomes of medial and lateral compartment patellofemoral joint (PFJ) osteoarthritis (OA).

**Methods** Information was collected by questionnaires, clinical assessment and x-rays from 745 eligible community-dwelling symptomatic adults aged  $\geq 50$  years. PFJ joint space narrowing (JSN) and osteophytes (OP) were scored from skyline radiographs using the OARSI atlas. Multilevel models were used to assess associations of compartmental PFJOA with age, gender, BMI and varus/valgus malalignment, while median regression was used to examine associations with clinical outcomes (current pain intensity 0-10NRS and WOMAC Function 0-68).

**Results** Isolated lateral PFJOA was more common than isolated medial PFJOA, particularly at higher severity thresholds. Irrespective of severity threshold, age ( $\geq 2$ :OR 1.19; 1.12, 1.26), BMI ( $\geq 2$ :OR 1.15; 1.07, 1.24) and valgus malalignment ( $\geq 2$ :OR 2.58; 1.09, 6.07) were associated with increased odds of isolated lateral JSN but isolated medial JSN was only associated with age ( $\geq 2$ :OR 1.20; 1.14, 1.27). The pattern of association was less clear for PFJ OP. Isolated lateral PFJOA, defined by JSN or OP, was associated with higher pain scores than isolated medial but these differences were modest and non-significant. A similar pattern of association was seen for functional limitation but only when PFJOA was defined by JSN.

**Conclusions** Isolated lateral PFJOA is more common than isolated medial and it is more consistently associated with established OA risk factors. It is also associated with higher, but clinically non-significant, pain and function scores than isolated medial PFJOA, particularly when defined using JSN. This article is protected by copyright. All rights reserved.

### 37. OSTEOARTHRITIS/KNEE

#### Acupuncture and its long/short term effect on knee OA

##### The Effects of Acupuncture on Chronic Knee Pain Due to Osteoarthritis

###### A Meta-Analysis

Xianfeng Lin, MD; Kangmao Huang, MD; Guiqi Zhu, MD; Zhaobo Huang, MD; An Qin, MD, PhD; Shunwu Fan, MD

*J Bone Joint Surg Am*, 2016 Sep 21; 98 (18): 1578 -1585 .

<http://dx.doi.org/10.2106/JBJS.15.0062>

**Background:** Acupuncture reportedly relieves chronic knee pain and improves physical function in patients diagnosed with osteoarthritis, but the duration of these effects is controversial. The aim of this study was to evaluate the temporal effects of acupuncture on chronic knee pain due to knee osteoarthritis by means of a meta-analysis.

**Methods:** The PubMed, Embase, and Cochrane Central Register of Controlled Trials databases were searched for studies published through March 2015. Ten randomized controlled trials of acupuncture compared with sham acupuncture, usual care, or no intervention for chronic knee pain in patients with clinically diagnosed or radiographically confirmed knee osteoarthritis were included. All of the studies were available in English. Weighted mean differences (WMDs), 95% confidence intervals (CIs), publication bias, and heterogeneity were calculated.

**Results:** The acupuncture groups showed superior pain improvement ( $p < 0.001$ ; WMD =  $-1.24$  [95% CI,  $-1.92$  to  $-0.56$ ];  $I^2 > 50\%$ ) and physical function ( $p < 0.001$ ; WMD =  $4.61$  [95% CI,  $2.24$  to  $6.97$ ];  $I^2 > 50\%$ ) in the short term (up to 13 weeks). The acupuncture groups showed superior physical function ( $p = 0.016$ ; WMD =  $2.73$  [95% CI,  $0.51$  to  $4.94$ ];  $I^2 > 50\%$ ) but not superior pain improvement ( $p = 0.199$ ; WMD =  $-0.55$  [95% CI,  $-1.39$  to  $0.29$ ];  $I^2 > 50\%$ ) in the long term (up to 26 weeks). Subgroup analysis revealed that the acupuncture groups tended to have better outcomes compared with the controls. Significant publication bias was not detected ( $p > 0.05$ ), but the heterogeneity of the studies was substantial.

**Conclusions:** This meta-analysis demonstrates that acupuncture can improve short and long-term physical function, but it appears to provide only short-term pain relief in patients with chronic knee pain due to osteoarthritis.

**Level of Evidence:** Therapeutic Level I. See Instructions for Authors for a complete description of levels of evidence.

### Yoga and OA

Evidence-Based Complementary and Alternative Medicine

#### Review Article

#### **The Effects of Yoga on Pain, Mobility, and Quality of Life in Patients with Knee Osteoarthritis: A Systematic Review**

Laidi Kan, Jiaqi Zhang, Yonghong Yang, and Pu Wang

**Objective:** To systematically assess the effects of yoga on pain, mobility, and quality of life in patients with knee osteoarthritis.

**Methods:** Pubmed, Medline, EMBASE, the Cochrane Central Register of Controlled Trials, Physiotherapy Evidence Database (PEDro), and other sources were searched systematically in this study. Two reviewers identified eligible studies and extracted data independently. Downs and Black's Quality Index were used to evaluate the methodological quality of the included studies.

**Results:** A total of 9 articles (6 studies) involving 372 patients with knee osteoarthritis met the inclusion criteria. The most common yoga protocol is 40~90 minutes/session, lasting for at least 8 weeks. The effect of yoga on pain relief and function improvement could be seen after two-week intervention.

**Conclusion:** This systematic review showed that yoga might have positive effects in relieving pain and mobility on patients with KOA, but the effects on quality of life (QOL) are unclear. Besides, more outcome measure related to mental health of yoga effects on people with KOA should be conducted.

**Med diet helps****Adherence to a Mediterranean diet is associated with lower prevalence of osteoarthritis: Data from the osteoarthritis initiative**

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Clinical Nutrition, 10/10/2016

**V**eronese N, et al.

It was the aim of this study to examine if adherence to the Mediterranean diet is connected with a lower prevalence of osteoarthritis (OA) of the knee in a large cohort from North America. It is concluded that higher adherence to a Mediterranean diet is connected with lower prevalence of knee OA. This remained when adjusting for potential confounders.

**Methods**

- In this study, 4,358 community-dwelling participants (2,527 females; mean age: 61.2 years) from the Osteoarthritis Initiative were incorporated.
- Adherence to the Mediterranean diet was assessed through a validated Mediterranean diet score (aMED) categorized into quartiles (Q).
- Knee OA was diagnosed both clinically and radiologically.
- The strength of the relationship between aMED (divided in quartiles) and knee OA was investigated through a logistic regression analysis and reported as odds ratios (OR) with 95% confidence intervals (CIs), adjusted for potential confounders.

**Results**

- Researchers found that participants with a higher adherence to Mediterranean diet had a significantly lower prevalence of knee OA compared to those with lower adherence (Q4: 25.2% vs. Q1: 33.8%;  $p < 0.0001$ ).
- Utilizing a logistic regression analysis, adjusting for 10 potential confounders with those in the lowest quartile of aMED as reference, participants with the highest aMED had a significant decrease in presence of knee OA (OR, 0.83; 95% CIs: 0.69-0.99,  $p = 0.04$ ).
- Results revealed that among the individual components of Mediterranean diet, only higher use of cereals was connected with lower odds of having knee OA (OR: 0.76; 95% CI: 0.60-0.98;  $p = 0.03$ ).

## 38 A. FOOT AND ANKLE

### Step down test ankle ROM

#### The Association of Ankle Dorsiflexion Range of Motion With Hip and Knee Kinematics During the Lateral Step Down Test

**Authors:** Alon Rabin, DPT, PhD<sup>1</sup>, Sigal Portnoy, PhD<sup>2,3</sup>, Zvi Kozol, PT, PhD<sup>1</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2016 **Volume:**0 **Issue:**0 **Pages:**1–31 **DOI:**10.2519/jospt.2016.6621

#### Study Design

Cross-sectional.

#### Background

Altered hip and knee kinematics have been associated with several knee disorders including anterior cruciate ligament tear, patellofemoral pain, and iliotibial band syndrome. Limited ankle dorsiflexion (DF) range of motion (ROM), which has been linked with some of these disorders, has also been associated with altered knee kinematics.

#### Objective

Explore the association of ankle DF ROM with hip and knee kinematics during a step down task.

#### Methods

Thirty healthy participants underwent a 3-dimensional analysis of hip and knee kinematics during a lateral step down test, followed by measurement of ankle DF ROM in weight-bearing (WB) and non-weight-bearing (NWB). Participants were dichotomized using the median values into low- and high-DF subgroups within both WB and NWB. Hip and knee kinematics were compared between the low- and high-DF subgroups.

#### Results

Participants in the low-DF subgroups exhibited greater peak hip adduction (WB,  $P=.01$ ; NWB,  $P<.01$ ) and greater peak knee external rotation (WB,  $P=.01$ ; NWB,  $P<.01$ ) compared with participants in the high-DF subgroups. In addition, participants in the low-DF WB subgroup exhibited decreased peak knee flexion compared with participants in the high-DF WB subgroup ( $P<.01$ ).

#### Conclusion

Individuals with a less ankle DF ROM exhibited hip and knee kinematics previously associated with several knee disorders suggesting this impairment may be involved in the pathogenesis of the same disorders. Assessment of ankle DF ROM may be useful as part of a pre-participation screening. Furthermore, deficits in ankle DF ROM may need to be addressed in individuals with

altered movement patterns. *J Orthop Sports Phys Ther*, Epub 29 Sep 2016.  
doi:10.2519/jospt.2016.6621

Keyword: ankle, hip, knee, range of motion

### 45 A. MANUAL THERAPY LUMBAR & GENERAL

#### Radiological guidelines

Chiropr Man Therap. 2016 Oct 5;24:39. eCollection 2016.

#### **Awareness of radiographic guidelines for low back pain: a survey of Australian chiropractors.**

Jenkins HJ1.

#### **Abstract**

**BACKGROUND:** Chiropractors have been shown to refer for lumbar radiography in clinical scenarios inconsistent with the current clinical guidelines for low back pain. It is unknown whether this is due to lack of adherence with known guidelines or a lack of awareness of relevant guidelines. Therefore, the aim of this study is to determine Australian chiropractors' awareness of, and reported adherence to, radiographic guidelines for low back pain. Demographic, chiropractic practice and radiographic usage characteristics will be investigated for association with poor guideline adherence.

**METHODS:** An online survey was distributed to Australian chiropractors from July to September, 2014. Survey questions assessed demographic, chiropractic practice and radiographic usage characteristics, awareness of radiographic guidelines for low back pain and the level of agreement with current guidelines. Results were analysed with descriptive statistics and logistic regression analysis.

**RESULTS:** There were 480 surveys completed online. Only 49.6 % (95 % confidence interval (95 % CI): 44.9, 54.4) reported awareness of radiographic guidelines for low back pain. Chiropractors reported a likelihood of referring for radiographs for low back pain: in new patients (47.6 % (95 % CI: 42.9, 52.3)); to confirm biomechanical pathologies (69.0 % (95 % CI: 64.5, 73.1)); to perform biomechanical analysis (37.5 % (95 % CI: 33.1, 42.0)); or to screen for contraindications (39.4 % (95 % CI: 35.0, 44.0)). Chiropractors agreed that radiographs for low back pain could be useful for: acute low back pain (54.0 % (95 % CI: 49.2, 58.7)); screening for contraindications (55.8 % (95 % CI: 51.0, 60.5)); or to confirm diagnosis and direct treatment (61.3 % (95 % CI: 56.5, 65.9)). Poorer adherence to current guidelines was seen if the chiropractor referred to in-house radiographic facilities, practiced a technique other than diversified technique or was unaware or unsure of current radiographic guidelines for low back pain.

**CONCLUSION:** Only 50 % of Australian chiropractors report awareness of current radiographic guidelines for low back pain. A poorer awareness of guidelines is associated with an increase in the reported likelihood of use, and the perceived usefulness of radiographs for low back pain, in clinical situations that fall outside of current guidelines. Therefore, education strategies may help to increase guideline knowledge and compliance.

## Manipulation and LBP

### **Complementary therapies in addition to medication for patients with non-chronic, non-radicular low back pain. A systematic review**

The American Journal of Emergency Medicine, 10/10/2016

Rothberg S, et al.

The aim of this systematic review was to address the following question: among patients with non-chronic LBP, does spinal manipulation, massage, exercise, or yoga, when combined with standard medical therapy, improve pain and functional outcomes more than standard medical therapy alone. It is concluded that for patients with non-chronic, non-radicular low back pain, available evidence does not support the use of spinal manipulation or exercise therapy in addition to standard medical therapy. There is lacking proof to figure out whether yoga or massage is valuable.

#### Methods

- In this study, the researchers utilized published searches to identify relevant studies, supplemented with the own updated search.
- Studies were culled from the Cochrane Register of Controlled Trials, Medline, EMBASE, CINAHL and the Index to Chiropractic Literature.
- The objective was to identify randomized studies that included patients with non-radicular LBP of <12 weeks duration that compared the complementary therapy to usual care, sham therapy, or to interventions known not to be efficacious, while providing all patients with standard analgesics.
- The results of interest were improvement in pain scores or measures of functionality.

#### Results

- The researchers recognized 2 RCTs in which chiropractic manipulation + medical therapy failed to show benefit versus medical therapy alone.
- They identified 4 RCTS in which exercise therapy + medical therapy failed to show benefit versus medical therapy alone.
- They didn't identify any eligible studies of yoga or massage therapy.

**48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE****Acupuncture and its long/short term effect on knee OA****The Effects of Acupuncture on Chronic Knee Pain Due to Osteoarthritis****A Meta-Analysis**

Xianfeng Lin, MD; Kangmao Huang, MD; Guiqi Zhu, MD; Zhaobo Huang, MD; An Qin, MD, PhD; Shunwu Fan, MD

*J Bone Joint Surg Am*, 2016 Sep 21; 98 (18): 1578 -1585 .

<http://dx.doi.org/10.2106/JBJS.15.0062>

**Background:** Acupuncture reportedly relieves chronic knee pain and improves physical function in patients diagnosed with osteoarthritis, but the duration of these effects is controversial. The aim of this study was to evaluate the temporal effects of acupuncture on chronic knee pain due to knee osteoarthritis by means of a meta-analysis.

**Methods:** The PubMed, Embase, and Cochrane Central Register of Controlled Trials databases were searched for studies published through March 2015. Ten randomized controlled trials of acupuncture compared with sham acupuncture, usual care, or no intervention for chronic knee pain in patients with clinically diagnosed or radiographically confirmed knee osteoarthritis were included. All of the studies were available in English. Weighted mean differences (WMDs), 95% confidence intervals (CIs), publication bias, and heterogeneity were calculated.

**Results:** The acupuncture groups showed superior pain improvement ( $p < 0.001$ ; WMD =  $-1.24$  [95% CI,  $-1.92$  to  $-0.56$ ];  $I^2 > 50\%$ ) and physical function ( $p < 0.001$ ; WMD =  $4.61$  [95% CI,  $2.24$  to  $6.97$ ];  $I^2 > 50\%$ ) in the short term (up to 13 weeks). The acupuncture groups showed superior physical function ( $p = 0.016$ ; WMD =  $2.73$  [95% CI,  $0.51$  to  $4.94$ ];  $I^2 > 50\%$ ) but not superior pain improvement ( $p = 0.199$ ; WMD =  $-0.55$  [95% CI,  $-1.39$  to  $0.29$ ];  $I^2 > 50\%$ ) in the long term (up to 26 weeks). Subgroup analysis revealed that the acupuncture groups tended to have better outcomes compared with the controls. Significant publication bias was not detected ( $p > 0.05$ ), but the heterogeneity of the studies was substantial.

**Conclusions:** This meta-analysis demonstrates that acupuncture can improve short and long-term physical function, but it appears to provide only short-term pain relief in patients with chronic knee pain due to osteoarthritis.

**Level of Evidence:** Therapeutic Level I. See Instructions for Authors for a complete description of levels of evidence.

## Shoulder impingement

**Exercises and Dry Needling for Subacromial Pain Syndrome: a Randomized Parallel-Group Trial**

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DOI: <http://dx.doi.org/10.1016/j.jpain.2016.08.013>

**Highlights**

- We examine effectiveness the inclusion of trigger point dry needling into an exercise program for the management of subacromial pain syndrome
- The inclusion of trigger point dry needling was effective for decreasing shoulder pain-related disability at short, medium- and long-term follow-ups
- The inclusion of trigger point dry needling was not related to greater decreases in shoulder pain outcomes at short, medium- and long-term follow-ups

**Abstract**

This randomized clinical trial investigated the effectiveness of exercise vs. exercise plus trigger point dry needling (TrP-DN) in subacromial pain syndrome.

A randomized parallel-group trial, with 1-year follow-up was conducted. Fifty subjects with subacromial pain syndrome were randomly allocated to receive exercise alone or exercise +TrP-DN. Participants in both groups were asked to perform an exercise program of the rotator cuff muscles twice daily for 5 weeks. Further, patients allocated to the exercise +TrP-DN group also received dry needling to active TrPs in the muscles reproducing shoulder symptoms during the 2<sup>nd</sup> and 4<sup>th</sup> sessions. The primary outcome was pain-related disability assessed with the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire. Secondary outcomes included mean current pain and the worst pain experienced in the shoulder during the previous week. They were assessed at baseline, one week, and 3, 6, and 12 months after the end of treatment. Analysis was by intention to treat with mixed ANCOVA adjusted for baseline outcomes. At 12 months, 47 (94%) patients completed follow-up. Statistically larger improvements (all,  $P < 0.01$ ) in shoulder disability was found for the exercise +TrP-DN group at all follow up periods [post:  $\Delta$  -20.6 (-23.8 to -17.4); 3 months:  $\Delta$  -23.2 (-28.3 to -18.1); 6 months:  $\Delta$  -23.6 (-28.9 to -18.3); 12 months:  $\Delta$  -13.9 (-17.5 to -10.3).

Both groups exhibited similar improvements in shoulder pain outcomes at all follow-up periods. The inclusion of TrP-DN to an exercise program was effective for improving disability in subacromial pain syndrome. No greater improvements in shoulder pain were observed.

## 56. ATHLETICS

### Upper body ex

Sports Med. 2016 Oct 3.

#### **The Optimal Load for Maximal Power Production During Upper-Body Resistance Exercises: A Meta-Analysis.**

Soriano MA1, Suchomel TJ2, Marín PJ3.

**BACKGROUND:** External mechanical power is considered to be one of the most important characteristics with regard to sport performance.

**OBJECTIVE:** The purpose of this meta-analysis was to examine the effect of load on kinetic variables such as mean and peak power during bench press and bench press throw, thus integrating the findings of various studies to provide the strength and conditioning professional with more reliable evidence upon which to base their program design.

**METHODS:** A search of electronic databases (MEDLINE, PubMed, Google Scholar, and Web of Science) was conducted to identify all publications up to 31 October 2015. Hedges'  $g$  (95 % confidence interval) was estimated using a weighted random-effect model, due to the heterogeneity ( $I^2$ ) of the studies. Egger's test was used to evaluate possible publication bias in the meta-analysis. A total of 11 studies with 434 subjects and 7680 effect sizes met the inclusion criterion and were included in the statistical analyses. Load in each study was labeled as one of three intensity zones: zone 1 represented an average intensity ranging from 0 to 30 % of one repetition maximum (1RM); zone 2 between 30 and 70 % of 1RM; and zone 3  $\geq 70$  % of 1RM.

**RESULTS:** These results showed different optimal loads for each exercise examined. Moderate loads (from  $>30$  to  $<70$  % of 1RM) appear to provide the optimal load for peak power and mean power in the bench press exercise. Lighter loads ( $<30$  % of 1RM) appear to provide the highest mean and highest peak power production in the bench press throw exercise. However, a substantial heterogeneity was detected  $I^2 > 75$  %.

**CONCLUSION:** The current meta-analysis of published literature provides evidence for exercise-specific optimal power loading for upper body exercises.

## Plyometrics

Sports Med. 2016 Oct 4.

**Effect of Plyometric Training on Vertical Jump Performance in Female Athletes: A Systematic Review and Meta-Analysis.**

Stojanović E1, Ristić V1, McMaster DT2,3, Milanović Z4.

**Abstract**

**BACKGROUND:** Plyometric training is an effective method to prevent knee injuries in female athletes; however, the effects of plyometric training on jump performance in female athletes is unclear.

**OBJECTIVE:** The aim of this systematic review and meta-analysis was to determine the effectiveness of plyometric training on vertical jump (VJ) performance of amateur, collegiate and elite female athletes.

**METHODS:** Six electronic databases were searched (PubMed, MEDLINE, ERIC, Google Scholar, SCIndex and ScienceDirect). The included studies were coded for the following criteria: training status, training modality and type of outcome measures. The methodological quality of each study was assessed using the physiotherapy evidence database (PEDro) scale. The effects of plyometric training on VJ performance were based on the following standardised pre-post testing effect size (ES) thresholds: trivial (<0.20), small (0.21-0.60), moderate (0.61-1.20), large (1.21-2.00), very large (2.01-4.00) and extremely large (>4.00).

**RESULTS:** A total of 16 studies met the inclusion criteria. The meta-analysis revealed that plyometric training had a most likely moderate effect on countermovement jump (CMJ) height performance (ES = 1.09; 95 % confidence interval [CI] 0.57-1.61; I<sup>2</sup> = 75.60 %). Plyometric training interventions of less than 10 weeks in duration had a most likely small effect on CMJ height performance (ES = 0.58; 95 % CI 0.25-0.91). In contrast, plyometric training durations greater than 10 weeks had a most likely large effect on CMJ height (ES = 1.87; 95 % CI 0.73-3.01). The effect of plyometric training on concentric-only squat jump (SJ) height was likely small (ES = 0.44; 95 % CI -0.09 to 0.97). Similar effects were observed on SJ height after 6 weeks of plyometric training in amateur (ES = 0.35) and young (ES = 0.49) athletes, respectively. The effect of plyometric training on CMJ height with the arm swing was likely large (ES = 1.31; 95 % CI -0.04 to 2.65). The largest plyometric training effects were observed in drop jump (DJ) height performance (ES = 3.59; 95 % CI -3.04 to 10.23). Most likely extremely large plyometric training effects on DJ height performance (ES = 7.07; 95 % CI 4.71-9.43) were observed following 12 weeks of plyometric training. In contrast, a possibly small positive training effect (ES = 0.30; 95 % CI -0.63 to 1.23) was observed following 6 weeks of plyometric training.

**CONCLUSION:** Plyometric training is an effective form of training to improve VJ performance (e.g. CMJ, SJ and DJ) in female athletes. The benefits of plyometric training on VJ performance

are greater for interventions of longer duration ( $\geq 10$  weeks).

### Dietary supplements safety and athletes

Curr Opin Clin Nutr Metab Care. 2016 Aug 23.

#### **Potential harmful effects of dietary supplements in sports medicine.**

Deldicque L<sup>1</sup>, Francaux M.

#### ***PURPOSE OF REVIEW:***

The purpose of this article is to collect the most recent data regarding the safety of well-known or emerging dietary supplements used by athletes.

#### ***RECENT FINDINGS:***

From January 2014 to April 2016, about 30 articles have been published in the field. New data show that 90% of sports supplements contain trace of estrogenic endocrine disruptors, with 25% of them having a higher estrogenic activity than acceptable. About 50% of the supplements are contaminated by melamine, a source of nonprotein nitrogen. Additional data accumulate toward the safety of nitrate ingestion. In the last 2 years, the safety of emerging supplements such as higenamine, potentially interesting to lose weight, creatine nitrate and guanidinoacetic acid has been evaluated but still needs further investigation.

#### ***SUMMARY:***

The consumption of over-the-counter supplements is very popular in athletes. Although most supplements may be considered as safe when taking at the recommended doses, athletes should be aware of the potential risks linked to the consumption of supplements. In addition to the risks linked to overdosage and cross-effects when combining different supplements at the same time, inadvertent or deliberate contamination with stimulants, estrogenic compounds, diuretics or anabolic agents may occur.

**62 B. CRYOTHERAPY****Contrast in heel pain****Alternate hot and cold application in the management of heel pain: a pilot study**

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DOI: <http://dx.doi.org/10.1016/j.foot.2016.09.007>

**Highlights**

- This is the first empirical examination of naturopathic practice in the treatment of heel pain.
- This study suggests that there could be clinical advantages in using alternating compresses in functional foot index.
- Naturopathic physical therapy significantly improves foot functionality and pain scores in patients with heel pain.

**Abstract****Background**

Despite a long-standing tradition of naturopathic physical therapy and hydrotherapy use in the treatment of musculoskeletal conditions, neither naturopathy, nor specific aspects of hydrotherapy have been tested for efficacy in the treatment of heel pain.

**Methods**

Patients (n = 20) were assigned to standard naturopathic physiotherapy care (NPC) with two adjuvant therapy groups: a control group (therapeutic ultrasound, n = 10), or alternating compresses (n = 10). Pain scores were measured before and after treatment using Visual Analog Scale (VAS) and foot functionality was measured using the Foot Function Index (FFI).

**Results**

FFI reduced from 46.97 to 31.98 (p = 0.005) among normal protocol patients and from 49.72 to 21.35 (p < 0.001) among patients receiving the alternating compress protocol. Average VAS pain intensity in the seven days of treatment decreased from 3.53 to 2.53 cm (p < 0.001) among patients receiving NPC and from 4.09 to 2.61 cm (p < 0.001) amongst those receiving NPC plus alternating compresses. There was no significant difference in pain score reduction between the two groups (p = 0.206), but patients with alternating compresses as part of their treatment had significant improvements in foot functionality (p = 0.007).

**Discussion**

Naturopathic physical therapy significantly improves foot functionality and pain scores in heel pain. Additionally, alternating compresses improve foot functionality scores

