

## 1. LUMBAR SPINE

### Lumbar Kinematics

Spine (Phila Pa 1976). 2017 Jul 1;42(13):E767-E774. doi: 10.1097/BRS.0000000000001967.

#### **The Kinematics and Spondylosis of the Lumbar Spine Vary Depending on the Levels of Motion Segments in Individuals With Low Back Pain.**

Basques BA<sup>1</sup>, Espinoza Orias AA, Shifflett GD, Fice MP, Andersson GB, An HS, Inoue N.

#### *STUDY DESIGN:*

A prospective cohort study.

#### *OBJECTIVE:*

The aim of this study was to identify associations of spondylotic and kinematic changes with low back pain (LBP).

#### *SUMMARY OF BACKGROUND DATA:*

The ability to characterize and differentiate the biomechanics of both the symptomatic and asymptomatic lumbar spine is crucial to alleviate the sparse literature on the association of lumbar spine biomechanics and LBP.

#### *METHODS:*

Lumbar dynamic plain radiographs (flexion-extension), dynamic computed tomography (CT) scanning (axial rotation, disc height), and magnetic resonance imaging (MRI, disc and facet degeneration grades) were obtained for each subject. These parameters were compared between symptomatic and control groups using Student t test and multivariate logistic regression, which controlled for patient age and sex and identified spinal parameters that were independently associated with symptomatic LBP. Disc grade and mean segmental motion by level were tested by one-way analysis of variance (ANOVA).

#### *RESULTS:*

Ninety-nine volunteers (64 asymptomatic/35 LBP) were prospectively recruited. Mean age was  $37.3 \pm 10.1$  years and 55% were male. LBP showed association with increased L5/S1 translation [odds ratio (OR) 1.63 per mm,  $P=0.005$ ], decreased flexion-extension motion at L1/L2 (OR 0.87 per degree,  $P=0.036$ ), L2/L3 (OR 0.88 per degree,  $P=0.036$ ), and L4/L5 (OR 0.87 per degree,  $P=0.020$ ), increased axial rotation at L4/L5 (OR 2.11 per degree,  $P=0.032$ ), decreased disc height at L3/L4 (OR 0.52 per mm,  $P=0.008$ ) and L4/L5 (OR 0.37 per mm,  $p<0.001$ ), increased disc grade at all levels (ORs 2.01-12.33 per grade,  $P=0.001-0.026$ ), and increased facet grade at L4/L5 (OR 4.99 per grade,  $P=0.001$ ) and L5/S1 (OR 3.52 per grade,  $P=0.004$ ). Significant associations were found between disc grade and kinematic parameters (flexion-extension motion, axial rotation, and translation) at L4/L5 ( $P=0.001$ ) and L5/S1 ( $P<0.001$ ), but not at other levels ( $P>0.05$ ).

#### *CONCLUSION:*

In symptomatic individuals, L4/L5 and L5/S1 levels were affected by spondylosis and kinematic changes. This study clarifies the relationships between kinematic alterations and LBP, mostly observed at the above-mentioned segments.

## 2. LBP

### Job strain

Scand J Work Environ Health. 2017 Jun 21. pii: 3654. doi: 10.5271/sjweh.3654.

#### **Temporal relationships between job strain and low-back pain.**

Magnusson Hanson LL<sup>1</sup>, Madsen IE, Rugulies R, Peristera P, Westerlund H, Descatha A.

**Objectives** Psychosocial working conditions are suggested risk factors for low-back pain, but it is unclear whether these associations are causal. The present study examined whether there are lagged and bidirectional associations between job strain and low-back pain and further controlled for unmeasured time-invariant confounding.

**Methods** The study was based on four biennial waves of data from the Swedish Longitudinal Occupational Survey of Health (SLOSH), including 3084 men and women. Cross-lagged analyses using structural equation modeling (SEM) were conducted on job strain, a combination of high job demands and low control, and any as well as low-back pain severity (how much any problems affected the respondents life). Analogous SEM (dynamic panel) models with fixed effects were also fitted to remove confounding from time-invariant factors (such as non-observed individual and environmental factors, eg, genetics, childhood conditions, personality).

**Results** The SEM models indicated bidirectional associations between job strain and any back pain over a 2-year time lag ( $\beta=0.21$  and  $0.19$ ,  $P<0.05$ ), when adjusting for a range of covariates. Job strain was also associated with an increase in low-back pain severity and vice versa. However, the SEM models with fixed-effects showed no statistically significant lagged relationships between job strain and any or low-back pain severity ( $\beta=-0.05$  and  $\beta=0.00$ , respectively).

**Conclusions** This study suggests that associations between job strain and low-back pain with a lag of years may be due to residual confounding by time invariant characteristics. Further studies are, however, needed to elucidate short-term relationships.

PMID: 28636724 DOI: 10.5271/sjweh.3654

## 5. SURGERY

### Factors

Eur Spine J. 2017 Jun 30. doi: 10.1007/s00586-017-5201-9.

#### **Which patient-reported factors predict referral to spinal surgery? A cohort study among 4987 chronic low back pain patients.**

van Dongen JM<sup>1</sup>, van Hooff ML<sup>2</sup>, Spruit M<sup>3</sup>, de Kleuver M<sup>4</sup>, Ostelo RWJG<sup>5,6</sup>.

Author information

Abstract

#### *PURPOSE:*

It is unknown which chronic low back pain (CLBP) patients are typically referred to spinal surgery. The present study, therefore, aimed to explore which patient-reported factors are predictive of spinal surgery referral among CLBP patients.

#### *METHODS:*

CLBP patients were consecutively recruited from a Dutch orthopedic hospital specialized in spine care (n = 4987). The outcome of this study was referral to spinal surgery (yes/no), and was assessed using hospital records. Possible predictive factors were assessed using a screening questionnaire. A prediction model was constructed using logistic regression, with backwards selection and  $p < 0.10$  for keeping variables in the model. The model was internally validated and evaluated using discrimination and calibration measures.

#### *RESULTS:*

Female gender, previous back surgery, high intensity leg pain, somatization, and positive treatment expectations increased the odds of being referred to spinal surgery, while being obese, having comorbidities, pain in the thoracic spine, increased walking distance, and consultation location decreased the odds. The model's fit was good ( $X^2 = 10.5$ ;  $p = 0.23$ ), its discriminative ability was poor (AUC = 0.671), and its explained variance was low (5.5%). A post hoc analysis indicated that consultation location was significantly associated with spinal surgery referral, even after correcting for case-mix variables.

#### *CONCLUSION:*

Some patient-reported factors could be identified that are predictive of spinal surgery referral. Although the identified factors are known as common predictive factors of surgery outcome, they could only partly predict spinal surgery referral.

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### IBS and semen

Urology. 2017 Jun 26. pii: S0090-4295(17)30650-7. doi: 10.1016/j.urology.2017.06.029.

#### **Population-Based Semen Analysis Results and Fertility among Patients with Inflammatory Bowel Disease: Results From Subfertility Health Assisted Reproduction and the Environment (SHARE) Study.**

Martin L<sup>1</sup>, Mullaney S<sup>2</sup>, Peche W<sup>3</sup>, Peterson K<sup>4</sup>, Chan S<sup>4</sup>, Morton R<sup>4</sup>, Wan Y<sup>5</sup>, Zhang C<sup>6</sup>, Presson AP<sup>6</sup>, Emery B<sup>2</sup>, Aston K<sup>2</sup>, Jenkins T<sup>2</sup>, Carrell D<sup>2</sup>, Hotaling J<sup>2</sup>.

#### **Author information**

#### **Abstract**

#### **OBJECTIVE:**

To evaluate male fertility in Crohn's Disease (CD) and Ulcerative Colitis (UC) by examining semen analysis results and paternity from the SHARE study (subfertility health assisted reproduction and the environment), a population-based cohort of semen analysis results from Utah men.

#### **METHODS:**

A population-based cohort of men with CD or UC was identified using the Utah Population Database (contains person level linked demographic, genealogical, and medical record information for 85% of Utahans) from 1996-2014, and validated by clinical chart review. This cohort was then cross-linked (n=55) to the SHARE population dataset of semen analysis results. Men with CD or UC were compared to population-based, age-matched, paired (1:1) controls (n=47). Paternity was evaluated through presence and number of linked offspring, and inter-birth interval.

#### **RESULTS:**

Offspring were identified in 71% of UC patients (mean of 1.8 children) and 61% of CD patients (mean of 1.2 children). Compared to matched controls, there were no differences in number of offspring, mean inter-birth interval, or any of the evaluated semen analysis parameters among either men with CD or UC.

#### **CONCLUSIONS:**

Fertility and semen analysis values among men with UC or CD are not significantly impacted compared to population-based, age-matched controls.

**Coffee may cause problems with sperm**

Nutr J. 2017 Jun 24;16(1):37.

**Coffee and caffeine intake and male infertility: a systematic review.**

Ricci E<sup>1</sup>, Viganò P<sup>2</sup>, Cipriani S<sup>3</sup>, Somigliana E<sup>4</sup>, Chiaffarino F<sup>3</sup>, Bulfoni A<sup>5</sup>, Parazzini F<sup>3,6</sup>.

**Abstract****BACKGROUND:**

Semen quality, a predictor of male fertility, has been suggested declining worldwide. Among other life style factors, male coffee/caffeine consumption was hypothesized to influence semen parameters, but also sperm DNA integrity. To summarize available evidence, we performed a systematic review of observational studies on the relation between coffee/caffeine intake and parameters of male fertility including sperm ploidy, sperm DNA integrity, semen quality and time to pregnancy.

**METHODS:**

A systematic literature search was performed up to November 2016 (MEDLINE and EMBASE). We included all observational papers that reported the relation between male coffee/caffeine intake and reproductive outcomes: 1. semen parameters, 2. sperm DNA characteristics, 3. fecundability. All pertinent reports were retrieved and the relative reference lists were systematically searched in order to identify any potential additional studies that could be included.

**RESULTS:**

We retrieved 28 papers reporting observational information on coffee/caffeine intake and reproductive outcomes. Overall, they included 19,967 men. 1. Semen parameters did not seem affected by caffeine intake, at least caffeine from coffee, tea and cocoa drinks, in most studies. Conversely, other contributions suggested a negative effect of cola-containing beverages and caffeine-containing soft drinks on semen volume, count and concentration. 2. As regards sperm DNA defects, caffeine intake seemed associated with aneuploidy and DNA breaks, but not with other markers of DNA damage. 3. Finally, male coffee drinking was associated to prolonged time to pregnancy in some, but not all, studies.

**CONCLUSIONS:**

The literature suggests that caffeine intake, possibly through sperm DNA damage, may negatively affect male reproductive function. Evidence from epidemiological studies on semen parameters and fertility is however inconsistent and inconclusive. Well-designed studies with predefined criteria for semen analysis, subject selection, and life style habits definition, are essential to reach a consistent evidence on the effect of caffeine on semen parameters and male fertility.

## 8. VISCERA

### Probiotic use helps with antibiotics

#### The use of probiotics and the effect in antibiotic associated diarrhea

Clinical Therapeutics

Andrade A, et al.

This study was conducted to characterize the proportion of antibiotic-associated diarrhea (AAD) cases and evaluate the effect of probiotics in gastrointestinal disorders in the consumers surveyed. Findings suggested that the use of probiotic-associated with antibiotic may reduce the incidence and intensity of diarrhea. Diarrhea had a higher proportion among respondents who did not take probiotics during treatment, and after treatment did not occur in those taking probiotics.

#### Methods

- Researchers conducted a prospective cross-sectional and observational study of patients to whom had been prescribed antibiotics during the period of the study.
- They collected data by questionnaire.
- They drew personal and therapeutic profile of each patient, in addition, they surveyed the use of probiotics, and his knowledge of probiotics.
- After the end of the all treatment, the proportion of cases of diarrhea was determined.

#### Results

- 91 antibiotic consumers were surveyed from March to May of 2015.
- 23.1% of respondents experienced AAD during the treatment and 4.4% post-treatment.
- 14.3% of the sample used probiotics.
- Knowledge regarding probiotics was shown by about one-third (35.2%) of the participants.
- Antibiotics most frequently used in this study included amoxicillin + clavulanic acid, azithromycin and clarithromycin.
- Observations indicated that 76.9% of exposed patients who took probiotics, did not suffer any episode of diarrhea.

**Gluten free diet and fibromyalgia**

J Clin Gastroenterol. 2017 Jul;51(6):500-507

**The Effects of a Gluten-free Diet Versus a Hypocaloric Diet Among Patients With Fibromyalgia Experiencing Gluten Sensitivity-like Symptoms: A Pilot, Open-Label Randomized Clinical Trial.**

Slim M<sup>1</sup>, Calandre EP, Garcia-Leiva JM, Rico-Villademoros F, Molina-Barea R, Rodriguez-Lopez CM, Morillas-Arques P.

**Abstract****BACKGROUND AND AIMS:**

Patients with fibromyalgia frequently present with symptoms similar to those experienced by patients with gluten-related disorders, raising the possibility that a subgroup of these patients could be experiencing underlying gluten sensitivity. This study aimed to evaluate the effects of a gluten-free diet (GFD) compared with a hypocaloric diet (HCD) among patients with fibromyalgia.

**METHODS:**

Adult patients diagnosed with fibromyalgia were randomly allocated to receive a GFD or a HCD over a 24-week period. The primary outcome measure was the change in the number of gluten sensitivity symptoms. The following secondary outcomes were evaluated: body mass index, Revised Fibromyalgia Impact Questionnaire, Pittsburgh Sleep Quality Index, Brief Pain Inventory, Beck Depression Inventory-II, State-Trait Anxiety Inventory, Short-Form Health Survey, Patient Global Impression Scale of Severity, Patient Global Impression Scale of Improvement, and adverse events.

**RESULTS:**

Seventy-five subjects were randomly allocated to receive either a GFD (n=35) or an HCD (n=40). The least squares mean change in the total number of gluten sensitivity symptoms from baseline did not differ significantly between the GFD and HCD groups (-2.44±0.40 for the GFD; -2.10±0.37 for the HCD; P=0.343). Similarly, the 2 dietary interventions did not differ in any of the remaining measured secondary outcomes. Both dietary interventions were well tolerated.

**CONCLUSIONS:**

Both dietary interventions were associated with similar beneficial outcomes in reducing gluten sensitivity symptoms and other secondary outcomes. However, despite its specificity, GFD was not superior to HCD in reducing the number of gluten sensitivity symptoms or secondary outcomes.

**IBS and probiotics**

Aliment Pharmacol Ther. 2017 Jun 27. doi:

**Systematic review with meta-analysis: the efficacy of probiotics in inflammatory bowel disease.**

Derwa Y<sup>1,2</sup>, Gracie DJ<sup>1,2</sup>, Hamlin PJ<sup>1</sup>, Ford AC<sup>1,2</sup>.

**Author information****Abstract****BACKGROUND:**

Ulcerative colitis (UC) and Crohn's disease (CD) are inflammatory bowel diseases (IBD). Evidence implicates disturbances of the gastrointestinal microbiota in their pathogenesis.

**AIM:**

To perform a systematic review and meta-analysis to examine the efficacy of probiotics in IBD.

**METHODS:**

MEDLINE, EMBASE, and the Cochrane Controlled Trials Register were searched (until November 2016). Eligible randomised controlled trials (RCTs) recruited adults with UC or CD, and compared probiotics with 5-aminosalicylates (5-ASAs) or placebo. Dichotomous symptom data were pooled to obtain a relative risk (RR) of failure to achieve remission in active IBD, or RR of relapse of disease activity in quiescent IBD, with 95% confidence intervals (CIs).

**RESULTS:**

The search identified 12 253 citations. Twenty-two RCTs were eligible. There was no benefit of probiotics over placebo in inducing remission in active UC (RR of failure to achieve remission=0.86; 95% CI=0.68-1.08). However, when only trials of VSL#3 were considered there appeared to be a benefit (RR=0.74; 95% CI=0.63-0.87). Probiotics appeared equivalent to 5-ASAs in preventing UC relapse (RR=1.02; 95% CI=0.85-1.23). There was no benefit of probiotics in inducing remission of active CD, in preventing relapse of quiescent CD, or in preventing relapse of CD after surgically induced remission.

**CONCLUSIONS:**

VSL#3 may be effective in inducing remission in active UC. Probiotics may be as effective as 5-ASAs in preventing relapse of quiescent UC. The efficacy of probiotics in CD remains uncertain, and more evidence from RCTs is required before their utility is known.



**Elimination diet for esophagitis****Efficacy of a 4-Food Elimination Diet for Children With Eosinophilic Esophagitis**

A.F. Kagalwalla J.B. Wechsler M. Chehade

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

A 6-food elimination diet induces remission in most children and adults with eosinophilic esophagitis (EoE). The effectiveness of empiric elimination of only 4 foods has not been studied in children. We performed a prospective observational outcome study in children with EoE treated with dietary exclusion of cow's milk, wheat, egg, and soy. The objective was to assess the clinical, endoscopic, and histologic efficacy of this treatment in EoE.

**Methods**

We recruited children (1-18 years old, diagnosed per consensus guidelines) from 4 medical centers. Study participants (N=78) were given a proton pump inhibitor twice daily and underwent a baseline esophagogastroduodenoscopy. Subjects were instructed on dietary exclusion of cow's milk, wheat, egg, and soy. Clinical, endoscopic, and histologic assessments were made after 8 weeks. Responders had single foods reintroduced for 8 weeks, with repeat endoscopy to assess for recurrence of active disease. The primary endpoint was histologic remission (fewer than 15 eosinophils per high-powered field). Secondary endpoints included symptom and endoscopic improvements and identification of foods associated with active histologic disease.

**Results**

After 8-weeks on 4-food elimination diet, 50 subjects were in histologic remission (64%). The subjects' mean baseline clinical symptoms score was 4.5 which decreased to 2.3 after 8 weeks of 4-food elimination diet ( $p < 0.001$ ). The mean endoscopic baseline score was 2.1 which decreased to 1.3 ( $p < 0.001$ ). After food reintroduction, the most common food triggers that induced histological inflammation were cow's milk (85%), egg (35%), wheat (33%), and soy (19%). One food trigger that induced recurrence of esophageal inflammation was identified in 62% of patients and cow's milk-induced EoE was present in 88% of these patients.

**Conclusions**

In a prospective study of children with EoE, 8 weeks of 4-food elimination diet induced clinical, endoscopic, and histological remission in more than 60% of children with EoE. While less restrictive than 6-food elimination diet, 4-food elimination diet was nearly as effective, and can be recommended as a treatment for children with EoE.

**10 A. CERVICAL SPINE****Neck pain sensory motor**

Arch Phys Med Rehabil. 2017 Jun;98(6):1257-1271. doi: 10.1016/j.apmr.2016.09.121. Epub 2016 Oct 19.

**Sensorimotor Control in Individuals With Idiopathic Neck Pain and Healthy Individuals: A Systematic Review and Meta-Analysis.**

de Zoete RMJ<sup>1</sup>, Osmotherly PG<sup>2</sup>, Rivett DA<sup>2</sup>, Farrell SF<sup>3</sup>, Snodgrass SJ<sup>2</sup>.

Author information

Abstract

*OBJECTIVES:*

(1) To identify reported tests used to assess sensorimotor control in individuals with idiopathic neck pain and (2) to investigate whether these tests can quantify differences between individuals with idiopathic neck pain and healthy individuals.

*DATA SOURCES:*

Allied and Complementary Medicine Database, CINAHL, Cochrane Central Register of Controlled Trials, Embase, MEDLINE, Physiotherapy Evidence Database, Scopus, and SPORTDiscus.

*STUDY SELECTION:*

Studies reporting sensorimotor outcomes in individuals with idiopathic neck pain or healthy individuals were identified. There were 1,677 records screened independently by 2 researchers for eligibility: 43 studies were included in the review, with 30 of these studies included in the meta-analysis.

*DATA EXTRACTION:*

Methodologic quality was determined using the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies. Data were extracted using a standardized extraction table.

*DATA SYNTHESIS:*

Sensorimotor control was most commonly assessed by joint position error and postural sway. Pooled means for joint position error after cervical rotation in individuals with neck pain (range, 2.2°-9.8°) differed significantly ( $P=.04$ ) compared with healthy individuals (range, 1.66°-5.1°). Postural sway with eyes open ranged from 4.85 to 10.5cm<sup>2</sup> (neck pain) and 3.5 to 6.6cm<sup>2</sup> (healthy) ( $P=.16$ ), and postural sway with eyes closed ranged from 2.51 to 16.6cm<sup>2</sup> (neck pain) and 2.74 to 10.9cm<sup>2</sup> (healthy) ( $P=.30$ ). Individual studies, but not meta-analysis, demonstrated differences between neck pain and healthy groups for postural sway. Other test conditions and other tests were not sufficiently investigated to enable pooling of data.

*CONCLUSIONS:*

The findings from this review suggest sensorimotor control testing may be clinically useful in individuals with idiopathic neck pain. However, results should be interpreted with caution because clinical differences were small; therefore, further cross-sectional research with larger samples is needed to determine the magnitude of the relation between sensorimotor control and pain and to assess any potential clinical significance.

## Facet joints

**The Physiological Basis of Cervical Facet-Mediated Persistent Pain: Basic Science and Clinical Challenges**

**Authors:** Meagan E. Ita, MS<sup>1</sup>, Sijia Zhang, BS<sup>1</sup>, Timothy P. Holsgrove, PhD<sup>1</sup>, Sonia Kartha, BS<sup>1</sup>, Beth A. Winkelstein, PhD<sup>1,2</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2017 **Volume:**47 **Issue:**7 **Pages:**450–461 **DOI:**10.2519/jospt.2017.7255

**Synopsis**

Chronic neck pain is a common condition and a primary clinical symptom of whiplash and other spinal injuries.

Loading-induced neck injuries produce abnormal kinematics between the vertebrae, with the potential to injure facet joints and the afferent fibers that innervate the specific joint tissues, including the capsular ligament. Mechanoreceptive and nociceptive afferents that innervate the facet have their peripheral terminals in the capsule, cell bodies in the dorsal root ganglia, and terminal processes in the spinal cord. As such, biomechanical loading of these afferents can initiate nociceptive signaling in the peripheral and central nervous systems. Their activation depends on the local mechanical environment of the joint and encodes the neural processes that initiate pain and lead to its persistence. This commentary reviews the complex anatomical, biomechanical, and physiological consequences of facet-mediated whiplash injury and pain. The clinical presentation of facet-mediated pain is complex in its sensory and emotional components. Yet, human studies are limited in their ability to elucidate the physiological mechanisms by which abnormal facet loading leads to pain.

Over the past decade, however, in vivo models of cervical facet injury that reproduce clinical pain symptoms have been developed and used to define the complicated and multifaceted electrophysiological, inflammatory, and nociceptive signaling cascades that are involved in the pathophysiology of whiplash facet pain. Integrating the whiplash-like mechanics in vivo and in vitro allows transmission of pathophysiological mechanisms across scales, with the hope of informing clinical management. Yet, despite these advances, many challenges remain. This commentary further describes and highlights such challenges. *J Orthop Sports Phys Ther* 2017;47(7):450–461. Epub 16 Jun 2017. doi:10.2519/jospt.2017.7255

**12 A. WHIPLASH****Vestibular disturbances in whiplash disorders****Dizziness, Unsteadiness, Visual Disturbances, and Sensorimotor Control in Traumatic Neck Pain**

**Authors:** Julia Treleaven, PhD, BPhty<sup>1</sup>

**AFFILIATIONS:**

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2017 **Volume:**47 **Issue:**7 **Pages:**492–502 **DOI:**10.2519/jospt.2017.7052

**Synopsis**

There is considerable evidence to support the importance of cervical afferent dysfunction in the development of dizziness, unsteadiness, visual disturbances, altered balance, and altered eye and head movement control following neck trauma, especially in those with persistent symptoms.

However, there are other possible causes for these symptoms, and secondary adaptive changes should also be considered in differential diagnosis. Understanding the nature of these symptoms and differential diagnosis of their potential origin is important for rehabilitation. In addition to symptoms, the evaluation of potential impairments (altered cervical joint position and movement sense, static and dynamic balance, and ocular mobility and coordination) should become an essential part of the routine assessment of those with traumatic neck pain, including those with concomitant injuries such as concussion and vestibular or visual pathology or deficits.

Once adequately assessed, appropriate tailored management should be implemented. Research to further assist differential diagnosis and to understand the most important contributing factors associated with abnormal cervical afferent input and subsequent disturbances to the sensorimotor control system, as well as the most efficacious management of such symptoms and impairments, is important for the future. *J Orthop Sports Phys Ther* 2017;47(7):492–502. Epub 16 Jun 2017. doi:10.2519/jospt.2017.7052

General ex does not help

## General Exercise Does Not Improve Long-Term Pain and Disability in Individuals With Whiplash-Associated Disorders: A Systematic Review

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2017 **Volume:**47 **Issue:**7 **Pages:**472–480 **DOI:**10.2519/jospt.2017.7081

### Study Design

Systematic review of randomized controlled trials.

### Background

General exercise, defined as purposeful physical activity involving repetitive exercises and incorporating multiple muscle groups, is frequently used in the management of whiplash-associated disorders (WADs). Evidence supporting its efficacy is not well established.

### Objectives

To determine whether general exercise is effective in reducing pain and disability in people with WAD.

### Methods

Studies published in English in peer-reviewed journals between January 1990 and May 2015 were eligible if they evaluated a general exercise intervention compared with a different intervention or control. Studies were required to evaluate pain and disability at medium-term (6–14 weeks) and long-term (52 weeks) follow-ups. The mean  $\pm$  SD and sample size were recorded for follow-up scores and for change scores from baseline to follow-up.

### Results

Of the 3 high-quality studies that were eligible for inclusion, none investigated general exercise alone. There were no clinically meaningful differences between comprehensive exercise programs, which included general exercise, and minimal intervention controls in the medium and long term. No studies directly compared general exercise with a no-treatment control. All included studies used different control interventions, preventing meta-analysis.

### Conclusion

A lack of significant long-term improvements from general exercise interventions in individuals with WAD was identified. This finding differs from the positive benefits of general exercise for other musculoskeletal conditions. This may, in part, relate to the complexity of whiplash conditions. This may also reflect the challenge of exercise prescription in this population, where the need for sufficient intensity is balanced against the impact that exercise has on pain.

## Interdisciplinary model

**An Integrated Model of Chronic Whiplash-Associated Disorder**

**Authors:** David M. Walton, PT, PhD<sup>1</sup>, James M. Elliott, PT, PhD<sup>2</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2017 **Volume:**47 **Issue:**7 **Pages:**462–471 **DOI:**10.2519/jospt.2017.7455

**Synopsis**

The development of persistent symptoms following whiplash injury from a motor vehicle collision is common and contributes substantially to societal and personal costs.

The popular Quebec Task Force classification system of whiplash-associated disorders (WADs) was meant to function as a prognostic and intervention decision aid, but its usefulness has been questioned. Emerging evidence highlights the heterogeneity of WAD by demonstrating physical and psychological impairments that are unique to those who develop persistent symptoms. These impairments are not recognized in the Quebec Task Force classification system. The purpose of this clinical commentary is to describe an integrated model that focuses on how psychological and neurobiological factors interact with, and are influenced by, existing personal and environmental factors to contribute to the development of chronic WAD.

The model has been developed through more than 20 years of work in the field, consultation with experts, in-depth synthesis of existing evidence, and new evidence from the authors' own research programs. A subtheme is that a point of convergence currently exists between the psychological, physiological, and social determinants of health literature that can further explain the complex presentation of WAD. The new model is proposed to orient future research toward more interdisciplinary efforts across nontraditional fields, including data scientists and consumers, to clarify the WAD condition. *J Orthop Sports Phys Ther* 2017;47(7):462–471. Epub 16 Jun 2017. doi:10.2519/jospt.2017.7455

**12 B. CERVICAL SURGERIES****PT ex after surgery**

J Manipulative Physiol Ther. 2017 Jun;40(5):330-339. doi: 10.1016/j.jmpt.2017.02.012. Epub 2017 May 9.

**Neck-Related Physical Function, Self-Efficacy, and Coping Strategies in Patients With Cervical Radiculopathy: A Randomized Clinical Trial of Postoperative Physiotherapy.**

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Author information

Abstract

**OBJECTIVE:**

The purpose of this study was to compare postoperative rehabilitation with structured physiotherapy to the standard approach in patients with cervical radiculopathy (CR) in a prospective randomized study at 6 months follow-up based on measures of neck-related physical function, self-efficacy, and coping strategies.

**METHODS:**

Patients with persistent CR and scheduled for surgery (N = 202) were randomly assigned to structured postoperative physiotherapy or a standard postoperative approach. Structured postoperative physiotherapy combined neck-specific exercises with a behavioral approach. Baseline, 3-month, and 6-month evaluations included questionnaires and clinical examinations. Neck muscle endurance, active cervical range of motion, self-efficacy, pain catastrophizing (CSQ-CAT), perceived control over pain, and ability to decrease pain were analyzed for between-group differences using complete case and per-protocol approaches.

**RESULTS:**

No between-group difference was reported at the 6-month follow-up (P = .05-.99), but all outcomes had improved from baseline (P < .001). Patients undergoing structured postoperative physiotherapy with ≥50% attendance at treatment sessions had larger improvements in CSQ-CAT (P = .04) during the rehabilitation period from 3 to 6 months after surgery compared with the patients who received standard postoperative approach.

**CONCLUSIONS:**

No between-group difference was found at 6 months after surgery based on measures of neck-related physical function, self-efficacy, and coping strategies. However, the results confirm that neck-specific exercises are tolerated by patients with CR after surgery and may suggest a benefit from combining surgery with structured postoperative physiotherapy for patients with CR.

### 13. CRANIUM/TMJ

#### TMJ and HA's

Pain Med. 2017 May 29. doi: 10.1093/pm/pnx127.

#### **Comparison Between Chronic Migraine and Temporomandibular Disorders in Pain-Related Disability and Fear-Avoidance Behaviors.**

Gil-Martínez A<sup>1,2,3</sup>, Navarro-Fernández G<sup>2</sup>, Mangas-Guijarro MÁ<sup>4</sup>, Lara-Lara M<sup>3,4</sup>, López-López A<sup>5</sup>, Fernández-Carnero J<sup>2,3,6</sup>, La Touche R<sup>1,2,3</sup>.

Author information

Abstract

#### *OBJECTIVE.:*

To compare patients with chronic migraine (CM) and chronic temporomandibular disorders (TMD) on disability, pain, and fear avoidance factors and to associate these variables within groups.

#### *DESIGN.:*

Descriptive, cross-sectional study.

#### *SETTINGS.:*

A neurology department and a temporomandibular disorders consult in a tertiary care center.

#### *SUBJECTS.:*

A total of 50 patients with CM and 51 patients with chronic TMD, classified by international criteria classifications.

#### *METHODS.:*

The variables evaluated included pain intensity (visual analog scale [VAS]), neck disability (NDI), craniofacial pain and disability (CF-PDI), headache impact (HIT-6), pain catastrophizing (PCS), and kinesiophobia (TSK-11).

#### *RESULTS.:*

Statistically significant differences were found between the CM group and the chronic TMD group in CF-PDI (  $P < 0.001$ ), PCS (  $P = 0.03$ ), and HIT-6 (  $P < 0.001$ ); however, there were no differences between the CM group and the VAS, NDI, and TSK-11 groups (  $P > 0.05$ ). For the chronic TMD group, the combination of NDI and TSK-11 was a significant covariate model of CF-PDI (adjusted  $R^2 = 0.34$ ). In the CM group, the regression model showed that NDI was a significant predictive factor for HIT-6 (adjusted  $R^2 = 0.19$ ).

#### *CONCLUSIONS.:*

Differences between the CM group and the chronic TMD group were found in craniofacial pain and disability, pain catastrophizing, and headache impact, but they were similar for pain intensity, neck disability, and kinesiophobia. Neck disability and kinesiophobia were covariates of craniofacial pain and disability (34% of variance) for chronic TMD. In the CM group, neck disability was a predictive factor for headache impact (19.3% of variance).



**Central sensitization**

*Pain Pract.* 2017 May 29. doi: 10.1111/papr.12604.

**Evidence for central sensitization in patients with temporomandibular disorders: a systematic review and meta-analysis of observational studies.**

La Touche R<sup>1,2,3,4</sup>, Paris-Aleman A<sup>1,2,3,4</sup>, Hidalgo-Pérez A<sup>1</sup>, López-de-Uralde-Villanueva I<sup>1,2,3,4</sup>, Angulo-Díaz-Parreño S<sup>2,5</sup>, Muñoz-García D<sup>1,2</sup>.

**Author information****Abstract**

Temporomandibular disorder (TMD) is a very wide term which includes a variety of clinical issues related to the masticatory muscles, the temporomandibular joint (TMJ), and their associated structures<sup>1</sup>. For TMD patients the main concern is pain, and it is the most common reason for medical consultation; but pain makes also a great challenge for clinicians<sup>2</sup>. In fact, dysfunction of the central nervous system when processing nociceptive input has been stated as a factor involved in the onset and maintenance of pain in patients with chronic TMD<sup>3</sup>. This article is protected by copyright. All rights reserved.

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**KEYWORDS:**

Central Nervous System; Myofascial Pain Dysfunction Syndrome; Temporomandibular Joint; Temporomandibular Joint Dysfunction Syndrome

**TMJ and occlusion****Temporomandibular disorders and dental occlusion. A systematic review of association studies: end of an era?****Authors****Daniele Manfredini, Luca Lombardo, iuseppe Siciliani****DOI:** 10.1111/joor.12531 [View/save citation](#)**Aim**

To answer a clinical research question: “is there any association between features of dental occlusion and temporomandibular disorders (TMD)?”

**Methods**

A systematic literature review was performed. Inclusion was based on: 1. the type of study, viz., clinical studies on adults assessing the association between TMD (e.g., signs, symptoms, specific diagnoses) and features of dental occlusion by means of single or multiple variable analysis, and 2. their internal validity, viz., use of clinical assessment approaches to TMD diagnosis.

**Results**

The search accounted for 25 papers included in the review, 10 of which with multiple variable analysis. Quality assessment showed some possible shortcomings, mainly related with the unspecified representativeness of study populations. Seventeen (N=17) articles compared TMD patients with non-TMD individuals, whilst 8 papers compared the features of dental occlusion in individuals with TMD signs/symptoms and healthy subjects in non-patient populations. Findings are quite consistent toward a lack of clinically-relevant association between TMD and dental occlusion. Only 2 (i.e., centric relation [CR]-maximum intercuspation [MI] slide and mediotrusive interferences) of the almost forty occlusion features evaluated in the various studies were associated with TMD in the majority (e.g., at least 50%) of single variable analyses in patient populations. Only mediotrusive interferences are associated with TMD in the majority of multiple variable analyses. Such association does not imply a causal relationship and may even have opposite implications than commonly believed (i.e., interferences being the result, and not the cause, of TMD).

**Conclusions**

Findings support the absence of a disease-specific association. Based on that, there seems to lack ground to further hypothesize a role for dental occlusion in the pathophysiology of TMD. Clinicians are encouraged to abandon the old gnathological paradigm in TMD practice.

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*J Oral Rehabil.* 2017 Jun 10. doi: 10.1111/joor.12532. [Epub ahead of print]

**Bite force and PT**

*Archives of Oral Biology, article in press*

**Does pain in the masseter and anterior temporal muscles influence maximal bite force?**

Marcelo Coelho Goiato<sup>a</sup>, Paulo Renato Junqueira Zuim<sup>a</sup>, Amália Moreno<sup>b</sup>, Daniela Micheline dos Santos<sup>a</sup>, Emily Vivianne Freitas da Silva<sup>a</sup>, Fernanda Pereira de Caxias<sup>a</sup>, Karina Helga Leal Turcio<sup>a</sup>

**Abstract***Objective*

The aim of this study was to evaluate changes in pain and muscle force, and the relationship between them, in patients with muscle pain and bruxism, prior to and after treatment.

*Methods*

Thirty women with bruxism and myofascial pain (Ia) were included in this study. Sleep bruxism diagnosis was made based on clinical diagnostic criteria, and awake bruxism diagnosis was made by patient questionnaires and the presence of tooth wear. The diagnosis of myofascial pain was established according to the Research Diagnostic Criteria for Temporomandibular Disorders (RDC-TMD). Dentulous or partially edentulous patients (rehabilitated with conventional fixed prostheses) were included in the study according to the inclusion and exclusion criteria. The pain treatment protocol included occlusal splints, patient education, and physiotherapy for 30 days. Bite force was measured using a dynamometer at the central incisor and the first molar regions on both sides. The exams were performed at baseline, after 7 days, and 30 days after treatment. The Wilcoxon test was used to compare patient pain level response among the periods analyzed in the study. Bite force data were submitted to two-way repeated-measures ANOVA, followed by the Tukey HSD test ( $p < 0.05$ ). A simple regression analysis was performed to verify the relation between pain level and bite force.

*Results*

Results revealed that there was a statistical difference in pain level over time for both muscles and sides ( $p < 0.01$ ). In the molar region, the bite force exhibited significantly higher values after 30 days of treatment, when compared with the baseline ( $p < 0.001$ ). There was a correlation between pain level and bite force only for the temporal muscle in all periods analyzed ( $p < 0.05$ ). There was no strong correlation in the response level points to support the association of pain and bite force.

*Conclusions*

Pain level decreased and bite force increased in the molar region after treatment. No strong correlation or dispersion in the relationship between pain levels and bite force was seen in women with myofascial pain and bruxism.

## Disc displacement

**Physiological effects of anterior repositioning splint on Temporomandibular joint disc displacement: A quantitative analysis.**

Chen HM<sup>1,2,3,4</sup>, Liu MQ<sup>1,3,4</sup>, Yap AU<sup>5,6,7</sup>, Fu KY<sup>1,3,4</sup>.

Author information

Abstract

*BACKGROUND:*

Anterior repositioning splints (ARS) are used primarily for the management of temporomandibular joint (TMJ) anterior disc displacement with reduction (ADDwR). However, the exact physiological effects of ARS are still unclear.

*OBJECTIVE:*

This study investigated the short and long-term effects of ARS on disc and condyle angles / positions by metric analysis.

*METHODS:*

22 subjects diagnosed with ADDwR were recruited. Maxillary full-coverage ARS were fabricated and MRI of TMJs were obtained before splint treatment, immediate post-insertion and 6 months after splint treatment. Disc-condyle relation was determined by disc-condyle angle measurement. Disc and condyle positions were described as X-Y coordinates with the summit of glenoid fossa as the origin of the coordinates.

*RESULTS:*

32 TMJs were classified as ADDwR and 12 were normal. Upon ARS insertion, all TMJs with ADDwR got normal disc-condyle relations. The condyles moved significantly forward and downward while the discs moved significantly backward and upward. MRI at 6 months after treatment (without ARS insertion) indicated that only 40.6% (13/32) of the joints were maintained in the normal disc-condyle relationship. The majority of condyles returned to their pre-treatment positions while the discs generally moved anteriorly again.

*CONCLUSION:*

The use of ARS resulted in forward and downward condyle movement and a concurrent backward movement of the disc resulting in ideal spatial disc-condyle relationship. The stability of this relationship, however, could not be maintained in the majority of TMJs upon ARS removal. Findings explain the good short-term clinical outcomes with ARS and their relatively lower efficacy in the long-term. This article is protected by copyright. All rights reserved.

## 16. CONCUSSIONS

### Non-responsive

Br J Sports Med. 2017 Jun;51(12):958-968. doi: 10.1136/bjsports-2016-097470. Epub 2017 May 8.

#### **Approach to investigation and treatment of persistent symptoms following sport-related concussion: a systematic review.**

Makdissi M<sup>1,2,3</sup>, Schneider KJ<sup>4,5,6</sup>, Feddermann-Demont N<sup>7,8</sup>, Guskiewicz KM<sup>9</sup>, Hinds S<sup>10</sup>, Leddy JJ<sup>11</sup>, McCrea M<sup>12</sup>, Turner M<sup>13,14</sup>, Johnston KM<sup>15</sup>.

Author information

Abstract

#### *OBJECTIVE:*

To conduct a systematic review of the literature regarding assessment and treatment modalities in patients with persistent symptoms following sport-related concussion (SRC).

#### *DATA SOURCES:*

We searched Medline, Embase, SPORTSDiscus, PsycINFO, CINAHL, Cochrane library and ProQuest Dissertation & Theses Global electronic databases.

#### *STUDY ELIGIBILITY CRITERIA:*

Studies were included if they were original research, reported on SRC as the primary source of injury, included patients with persistent postconcussive symptoms (>10 days) and investigated the role of assessment or treatment modalities.

#### *RESULTS:*

Of 3225 articles identified in the preliminary search, 25 articles met the inclusion criteria. 11 articles were concerned with assessment and 14 articles with treatment of persistent symptoms following SRC. There were three randomised control trials and one quasi-experimental study. The remainder consisting of cross-sectional studies, historical cohorts and case series.

#### *SUMMARY:*

'Persistent symptoms' following SRC can be defined as clinical recovery that falls outside expected time frames (ie, >10-14 days in adults and >4 weeks in children). It does not reflect a single pathophysiological entity, but describes a constellation of non-specific post-traumatic symptoms that may be linked to coexisting and/or confounding pathologies. A detailed multimodal clinical assessment is required to identify specific primary and secondary processes, and treatment should target specific pathologies identified. There is preliminary evidence supporting the use of symptom-limited aerobic exercise, targeted physical therapy and a collaborative approach that includes cognitive behavioural therapy.

Management of patients with persistent symptoms is challenging and should occur in a multidisciplinary collaborative setting, with healthcare providers with experience in SRC.

**Soccer concussions**

Br J Sports Med. 2017 Jun 23.

**Head injuries in professional male football (soccer) over 13 years: 29% lower incidence rates after a rule change (red card).**

Beaudouin F<sup>1</sup>, Aus der Fünten K<sup>1</sup>, Tröß T<sup>1</sup>, Reinsberger C<sup>2</sup>, Meyer T<sup>1</sup>.

**Abstract****BACKGROUND:**

Absolute numbers of head injuries in football (soccer) are considerable because of its high popularity and the large number of players. In 2006 a rule was changed to reduce head injuries. Players were given a red card (sent off) for intentional elbow-head contact.

**AIMS:**

To describe the head injury mechanism and examine the effect of the rule change.

**METHODS:**

Based on continuously recorded data from the German football magazine "kicker", a database of all head injuries in the 1<sup>st</sup> German Male Bundesliga was generated comprising seasons 2000/01-2012/13. Injury mechanisms were analysed from video recordings. Injury incidence rates (IR) and 95% confidence intervals (95% CI) as well as incidence rate ratios (IRR) to assess differences before and after the rule change were calculated.

**RESULTS:**

356 head injuries were recorded (IR 2.22, 95% CI 2.00 to 2.46 per 1000 match hours). Contact with another player caused most head injuries, more specifically because of head-head (34%) or elbow-head (17%) contacts. After the rule change, head injuries were reduced by 29% (IRR 0.71, 95% CI 0.57 to 0.86, p=0.002). Lacerations/abrasions declined by 42% (95% CI 0.39 to 0.85), concussions by 29% (95% CI 0.46 to 1.09), contusions by 18% (95% CI 0.43 to 1.55) and facial fractures by 16% (95% CI 0.55 to 1.28).

**CONCLUSIONS:**

This rule change appeared to reduce the risk of head injuries in men's professional football.

**22 A. IMPINGEMENT****Exercise helps**

Arch Phys Med Rehabil. 2017 Jun 23. .

**Effects of scapular stabilization exercise training on scapular kinematics, disability, and pain in subacromial impingement: A randomized controlled trial.**

Turgut E<sup>1</sup>, Duzgun I<sup>2</sup>, Baltaci G<sup>3</sup>.

**Abstract****OBJECTIVE:**

To investigate the effects of two different exercise programs on three-dimensional scapular kinematics, disability, and pain in participants with subacromial impingement syndrome (SIS).

**DESIGN:**

Randomized controlled trial.

**SETTING:**

Outpatient clinic and research laboratory.

**PARTICIPANTS:**

Thirty participants who were diagnosed with SIS and who also exhibited scapular dyskinesis.

**INTERVENTIONS:**

The participants were randomized in two different exercise groups: 1) shoulder girdle stretching and strengthening with additional scapular stabilization exercises based on a kinetic chain approach (intervention group), and 2) shoulder girdle stretching and strengthening exercises only (control group).

**MAIN OUTCOME MEASURES:**

Three-dimensional scapular kinematics, self-reported shoulder pain, and disability were evaluated at baseline, after 6 weeks of training, and after 12 weeks of training.

**RESULTS:**

Significant differences were observed between the control and intervention group in external rotation and posterior tilt after 6 weeks of training and in external rotation, posterior tilt, and upward rotation after 12 weeks of training. All groups showed improvement in self-reported pain and disability scores, however there were no significant differences between the groups.

**CONCLUSION:**

Progressive exercise training independent from specific scapular stabilization exercises provides decreased disability and pain severity in impingement syndrome.

**30 A. IMPINGEMENT****Adolescents surgery****Arthroscopic Treatment of Femoroacetabular Impingement in Adolescents Provides Clinically Significant Outcome Improvement**

Benedict U. Nwachukwu, M.D., M.B.A. Brenda Chang, M.S., M.P.H. Cynthia A. Kahlenberg, M.D. Kara Fields, M.S. Danyal H. Nawabi, M.D. Bryan T. Kelly, M.D. Anil S. Ranawat, M.D.

DOI: <http://dx.doi.org/10.1016/j.arthro.2017.04.008>

**Purpose**

To define minimal clinically important difference (MCID) and substantial clinical benefit (SCB) for adolescents undergoing arthroscopic femoroacetabular impingement (FAI) surgery.

**Methods**

A prospective institutional hip preservation registry was reviewed to identify hip arthroscopies performed for FAI. Patients with pre-existing hip conditions such as slipped capital femoral epiphysis and Legg-Calve-Perthes were excluded. Included patients were 18 years and younger. The modified Harris Hip Score (mHHS), the Hip Outcome Score (HOS), and the international Hip Outcome Tool (iHOT-33) were administered as part of the registry. MCID was calculated using a distribution-based method, and SCB was calculated using a physical function anchor question. Receiver operating characteristic analysis with area under the curve (AUC) was used for psychometric analyses.

**Results**

Forty-seven adolescents were identified. The majority of patients were female (n = 32, 68.1%) with a mean age of 16.5 ( $\pm$ 1.1) years. The MCID (% achieving) for the mHHS, HOS activities of daily living (ADL), HOS Sport, and iHOT-33 was 9.5 (85%), 9.8 (79%), 12.1 (85%), and 10.7 (94%), respectively. Ninety-two percent of adolescents reported some form of improved hip physical ability on the anchor question. The following 1-year absolute outcome scores were significantly representative of an SCB state on the mHHS, HOS ADL, HOS Sport, and mHHS, respectively (AUC): 93.5 (0.79), 98.5 (0.84), 96.9 (0.81), and 85.9 (0.76).

**Conclusions**

Adolescents undergoing arthroscopic FAI surgery achieve clinically significant outcome improvement. We found that the vast majority of adolescents achieve MCID on hip-specific patient-reported outcome tools. However, although adolescents readily achieve MCID, a considerable improvement in postoperative outcome score is often needed to perceive a substantial benefit (SCB). The available hip outcome tools may be subject to ceiling effects for measuring clinically significant outcome improvement in adolescents.



**32 A. KNEE/ACL****Challenges in repairing hypermobile joints**

Arthroscopy. 2017 Jun 6. pii: S0749-8063(17)30384-5. doi: 10.1016/j.arthro.2017.04.012.

**Generalized Hypermobility, Knee Hyperextension, and Outcomes After Anterior Cruciate Ligament Reconstruction: Prospective, Case-Control Study With Mean 6 Years Follow-up.**

Larson CM<sup>1</sup>, Bedi A<sup>2</sup>, Dietrich ME<sup>3</sup>, Swarngen JC<sup>3</sup>, Wulf CA<sup>4</sup>, Rowley DM<sup>3</sup>, Giveans MR<sup>4</sup>.

**Author information****Abstract****PURPOSE:**

To determine whether generalized hypermobility and contralateral knee hyperextension affect failure rates and patient-related outcomes after anterior cruciate ligament reconstruction (ACLR).

**METHODS:**

A total of 226 consecutive patients presenting with acute ACL tears were prospectively evaluated for generalized hypermobility by a modified Beighton criteria. Minimum 2-year follow-up was achieved for 183 knees (81%). Patients underwent ACLR with either bone-patellar-tendon (BPTB) autograft (n = 46), quadrupled hamstring (HT) autograft (n = 85), or allograft tissue (n = 52). KT-1000 measurements, International Knee Documentation Committee (IKDC), Cincinnati, and Lysholm scores were obtained.

**RESULTS:**

Forty-one of 183 consecutive patients were categorized as hypermobile. At mean 6 years' follow-up (range 2-12.5 years), IKDC (P = .003), Cincinnati (P = .001), and Lysholm scores (P < .001) were significantly better in the Non-Hypermobile group for patients with an intact graft. The failure rate was higher in the Hypermobile group (10 knees, 24.4% failure rate) compared with the Nonhypermobile group (11 knees, 7.7% failure rate) (P = .006). The overall ACL injury rate (ACL graft injury, excessive graft laxity, plus contralateral ACL tear) was higher in the Hypermobile group (34.1%) compared with the Nonhypermobile group (12.0%) (P = .002). Heel height >5 cm (P = .009) and fifth metacarpophalangeal (MCP) extension >90° (P = .006) were independently predictive of failure for the entire study population.

**CONCLUSIONS:**

Graft failure rates were higher and inferior subjective outcomes were observed after ACLR in patients with generalized hypermobility. Heel height and fifth MCP hyperextension were most predictive of ACL injury/reinjury and poorer outcome scores. Nearly one-third of hypermobile patients sustained a contralateral ACL tear, ipsilateral graft failure, or had excessive graft laxity.

**LEVEL OF EVIDENCE:** Level III, case control study.

### 33. MENISCUS

#### Lateral meniscus surgery

##### Systematic Review of the Long-term Surgical Outcomes of Discoid Lateral Meniscus

Yong Seuk Lee, M.D., Ph.D. Seow Hui Teo, M.B.B.S. Jin Hwan Ahn, M.D., Ph.D. O-Sung Lee, M.D. Seung Hoon Lee, M.D. Je Ho Lee, M.D.

DOI: <http://dx.doi.org/10.1016/j.arthro.2017.04.006>

#### **Purpose**

To evaluate the surgical treatment of the discoid lateral meniscus (DLM) with long-term follow-up and to search which factors are related to good clinical or radiological outcomes.

#### **Methods**

Search was performed using a MEDLINE, EMBASE, and Cochrane database, and each of the selected studies was evaluated for methodological quality using a risk of bias (ROB) covering 7 criteria. Clinical and radiological outcomes with more than 5 years of follow-up were evaluated after surgical treatment of DLM. They were analyzed according to the age, follow-up period, kind of surgery, DLM type, and alignment.

#### **Results**

Eleven articles (422 DLM cases) were included in the final analysis. Among 7 criteria, 3 criteria showed little ROB in all studies. However, 4 criteria showed some ROB (“Yes” in 63.6% to 81.8%). The minimal follow-up period was 5.5 years (weighted mean follow-up: 9.1 years). Surgical procedures were performed with open or arthroscopic partial central meniscectomy, subtotal meniscectomy, total meniscectomy, or partial meniscectomy with repair. The majority of the studies showed good clinical results. Mild joint space narrowing was reported in the lateral compartment, but none of the knees demonstrated moderate or advanced degenerative changes. Increased age at surgery, longer follow-up period, and subtotal or total meniscectomy could be related to degenerative change. The majority of the complications was osteochondritis dissecans at the lateral femoral condyle (13 cases) and reoperation was performed by osteochondritis dissecans (4 cases), recurrent swelling (2 cases), residual symptom (1 case), stiffness (1 case), and popliteal stenosis (1 case).

#### **Conclusions**

Good clinical results were obtained with surgical treatment of symptomatic DLM. The progression of degenerative change was minimal and none of the knees demonstrated moderate or advanced degenerative changes. Increased age at surgery, longer follow-up period, and subtotal or total meniscectomy were possible risk factors for degenerative changes.

## 34. PATELLA

### Bracing

#### **Patellar bracing affects sEMG activity of leg and thigh muscles during stance phase in patellofemoral pain syndrome**

Fatemeh Salarie Sker Mehrdad Anbarian Amir H. Yazdani Pouria Hesari , Arash Babaei-Ghazani

DOI: <http://dx.doi.org/10.1016/j.gaitpost.2017.06.271>

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#### **Highlights**

- Long-term use of the patellar brace could increase sEMG activity of VMO muscle.
- There is no significant immediate effect in VMO following treatment with the patellar brace.
- Immediately after wearing the patellar brace, activity of Semitendinosus will decline during mid-stance.

#### **Abstract**

##### **Background**

Decreases in patellofemoral pain symptoms with bracing treatment have been established; but, the mechanisms remain unclear. The purpose of this study was to determine the immediate and long-term effects of the patellar bracing on electromyography (EMG) activity of the Vastus Medialis (VM) and Lateralis (VL), Rectus Femoris, lateral Gastrocnemius, Biceps Femoris and Semitendinosus (ST) muscles during level walking.

##### **Methods**

12 eligible women aged 20 to 30 years with diagnosis of patellofemoral pain participated in the before and after study. Intervention consisted of 8 weeks of patellar bracing. First, patients were tested without brace, then with a brace, and finally eight weeks later without a brace. Surface EMG activation of the selected muscles during level walking was recorded.

##### **Results**

After eight weeks of patellar bracing, EMG activity of VM muscle was significantly higher when compared to first session without brace ( $p = 0.011$ ) at mid-stance sub-phase. Additionally, EMG activity of ST muscle during first session with brace was significantly lower when compared to first session without brace at mid-stance sub-phase (without brace) ( $p = 0.012$ ). EMG activity of VM muscle after eight weeks of patellar bracing was significantly higher than the first session without brace at late stance and preswing sub-phase ( $p = 0.013$ ).

##### **Conclusion**

Long-term wearing of patellar bracing increases EMG activity of VM during mid-stance and late stance and preswing sub-phases of gait and immediate effect of patellar brace is decrease of EMG activity of ST muscle during mid-stance.

**37. OSTEOARTHRITIS/KNEE****Triamcinolone helps**

*JAMA*. 2017 May 16;317(19):1967-1975. doi: 10.1001/jama.2017.5283.

**Effect of Intra-articular Triamcinolone vs Saline on Knee Cartilage Volume and Pain in Patients With Knee Osteoarthritis: A Randomized Clinical Trial.**

McAlindon TE<sup>1</sup>, LaValley MP<sup>2</sup>, Harvey WF<sup>1</sup>, Price LL<sup>3</sup>, Driban JB<sup>1</sup>, Zhang M<sup>1</sup>, Ward RJ<sup>4</sup>.

**Author information****Abstract****IMPORTANCE:**

Synovitis is common and is associated with progression of structural characteristics of knee osteoarthritis. Intra-articular corticosteroids could reduce cartilage damage associated with synovitis but might have adverse effects on cartilage and periarticular bone.

**OBJECTIVE:**

To determine the effects of intra-articular injection of 40 mg of triamcinolone acetone every 3 months on progression of cartilage loss and knee pain.

**DESIGN, SETTING, AND PARTICIPANTS:**

Two-year, randomized, placebo-controlled, double-blind trial of intra-articular triamcinolone vs saline for symptomatic knee osteoarthritis with ultrasonic features of synovitis in 140 patients. Mixed-effects regression models with a random intercept were used to analyze the longitudinal repeated outcome measures. Patients fulfilling the American College of Rheumatology criteria for symptomatic knee osteoarthritis, Kellgren-Lawrence grades 2 or 3, were enrolled at Tufts Medical Center beginning February 11, 2013; all patients completed the study by January 1, 2015.

**INTERVENTIONS:**

Intra-articular triamcinolone (n = 70) or saline (n = 70) every 12 weeks for 2 years.

**MAIN OUTCOMES AND MEASURES:**

Annual knee magnetic resonance imaging for quantitative evaluation of cartilage volume (minimal clinically important difference not yet defined), and Western Ontario and McMaster Universities Osteoarthritis index collected every 3 months (Likert pain subscale range, 0 [no pain] to 20 [extreme pain]; minimal clinically important improvement, 3.94).

**RESULTS:**

Among 140 randomized patients (mean age, 58 [SD, 8] years, 75 women [54%]), 119 (85%) completed the study. Intra-articular triamcinolone resulted in significantly greater cartilage volume loss than did saline for a mean change in index compartment cartilage thickness of -0.21 mm vs -0.10 mm (between-group difference, -0.11 mm; 95% CI, -0.20 to -0.03 mm); and no significant difference in pain (-1.2 vs -1.9; between-group difference, -0.6; 95% CI, -1.6 to 0.3). The saline group had 3 treatment-related adverse events compared with 5 in the triamcinolone group and had a small increase in hemoglobin A1c levels (between-group difference, -0.2%; 95% CI, -0.5% to -0.007%).

**CONCLUSIONS AND RELEVANCE:**

Among patients with symptomatic knee osteoarthritis, 2 years of intra-articular triamcinolone, compared with intra-articular saline, resulted in significantly greater cartilage volume loss and no significant difference in knee pain. These findings do not support this treatment for patients with symptomatic knee osteoarthritis.

**Quad strengthening does not help****Quadriceps strengthening exercises may not change pain and function in knee osteoarthritis**

Hamid Reza Bokaeian Amir Hoshang Bakhtiary Majid Mirmohammadkhani Jamileh Moghimi

DOI: <http://dx.doi.org/10.1016/j.jbmt.2017.06.013>

**Abstract**

It is believed that Quadriceps strength training may reduce pain and improve functional activity in patients with knee osteoarthritis (OA).

This improvement is generally attributed to an increase in quadriceps strength. This study investigated whether quadriceps muscle strength increases with decreasing pain, improving functional activity in knee OA. Twenty-four patients with knee OA participated in an 8-week treatment protocol including traditional physical therapy and strength training 3 sessions per week. Measurements were conducted before and after the intervention and included the peak torque of quadriceps muscle, pain by visual analogue scale (VAS), short Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and functional activity by the 2 minute walking test (2MWT) and time up & go test (TUGT). After the intervention, analysis of data illustrated that changes in quadriceps muscle strength correlated with changes in VAS ( $r^2 = 0.310$ ,  $p = 0.005$ ), WOMAC ( $r^2 < 0.278$ ,  $p < 0.008$ ) and 2MWT ( $r^2 < 0.275$ ,  $p < 0.009$ ) significantly, although the correlation slope was negligible. No correlation was found between muscle strength and TUGT. However, the strength training significantly improved quadriceps muscle strength ( $p = 0.013$ ), pain and functional activity ( $p = 0.000$ ).

This study showed that reduction in pain and improvement in functional activity occurs independently from an increase in quadriceps muscle strength in knee OA. It seems that increased quadriceps muscle strength may not be a cause of improvement in pain and functional activity in knee OA.

## 40. ANKLE SPRAINS AND INSTABILITY

### Postural changes

#### Assessment of Relationships Between Joint Motion Quality and Postural Control in Patients With Chronic Ankle Joint Instability

**Authors:** Dawid Bączkiewicz, PhD<sup>1</sup>, Krzysztof Falkowski, MD<sup>2</sup>, Edyta Majorczyk, PhD<sup>1,3</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2016 **Volume:**0 **Issue:**0 **Pages:**1–26 **DOI:**10.2519/jospt.2017.6836

#### Study Design

Controlled laboratory study, cross sectional.

#### Background

Lateral ankle sprains are among the most common injuries encountered during athletic participation. Following the initial injury there is an alarmingly high risk of re-injury and development of chronic ankle instability (CAI), which is dependent on a combination of factors, including sensorimotor deficits and changes in the biomechanical environment of the ankle joint.

#### Objective

To evaluate CAI-related disturbances in arthrokinematic motion quality and postural control and the relationships between them.

#### Methods

Sixty-three male subjects (31 with CAI and 32 healthy controls) were enrolled in the study. For arthrokinematic motion quality analysis, the vibroarthrographic signals were collected during ankle flexion/extension motion using an acceleration sensor and described by variability (VMS), amplitude (R4) and frequency (P1 and P2) parameters. Using the Biodex Balance System, single leg dynamic balance was measured by overall (OSI), anteroposterior (APSI), and mediolateral (MLSI) stability indices.

#### Results

In the CAI group values of vibroarthrographic parameters (VMS, R4, P1 and P2) were significantly higher than in the controls ( $p < 0.01$ ). Similar results were obtained for all postural control parameters (OSI, APSI, MLSI;  $p < 0.05$ ). Moreover, correlations between OSI and VMS, P1 and P2, as well as APSI and P1 and P2 were observed in the CAI patient group but not in controls.

#### Conclusions

In patients with CAI, deficits in both quality of ankle arthrokinematic motion and postural control was present. Therefore physical therapy interventions focused on improving ankle neuromuscular control and arthrokinematic function are necessary in CAI patient care. *J Orthop Sports Phys Ther*, Epub 4 Nov 2016. doi:10.2519/jospt.2017.6836

**45 A. MANUAL THERAPY LUMBAR & GENERAL****Chiro adverse events**

Musculoskeletal Science and Practice

**Adverse events in a chiropractic spinal manipulative therapy single-blinded, placebo, randomized controlled trial for migraineurs**

- Aleksander Chaibi, PhD<sup>a, b, c</sup>, Jūratė Šaltytė Benth, PhD<sup>b, c</sup>, Peter J. Tuchin<sup>d</sup> (Associate professor),
- Michael Bjørn Russell<sup>a, b</sup> (Professor)

<https://doi.org/10.1016/j.msmsp.2017.03.003>

**Highlights**

- Manual-therapy RCTs do not always report adverse events (AEs) in contrast to pharmacological RCTs.
- This is the first prospective manual-therapy 3-armed single-blinded placebo RCT reporting all AEs for migraineurs.
- Local tenderness, tiredness and neck pain were the most common AEs. No severe or serious AE were reported.
- We observed fewer AEs in our study than what is reported in prophylactic migraine RCTs rolo or candesartan.

**Background** Unlike pharmacological randomized controlled trials (RCTs), manual-therapy RCTs do not always report adverse events (AEs). The few manual-therapy RCTs that provide information on AEs are frequently without details, such as the type and-, severity of the AE and reason for withdrawal.

### Adverse events in chiros

**Objective** To prospectively report all AEs in a chiropractic spinal manipulative therapy (CSMT) RCT.

**Design** A prospective 3-armed, single-blinded, placebo, RCT.

**Methods** Seventy migraineurs were randomized to the CSMT or a placebo, with 12 intervention sessions over three months. The recommendations by CONSORT and the International Headache Society's Task Force on AEs in migraine RCTs were followed. A standardized reporting scheme designed for pharmacological RCTs was used, and the AEs were described as frequencies and percentages within each group. The 95% confidence intervals (CIs) for the percentages (absolute risk) of AEs in each group were calculated when possible. Attributable risk (%) and relative risk were calculated with the corresponding 95% CIs.

**Results** AEs were assessed in 703 sessions, with 355 in the CSMT group and 348 in the placebo group. Local tenderness was the most common AE, reported by 11.3% and 6.9% of the CSMT group and the placebo group, respectively, and tiredness on the intervention day was reported by 8.5% and 1.4% of CSMT group and the placebo group, respectively. The highest attributable risk was for tiredness on the treatment day, 7.0% (CI 3.9–10.2%) which presented a relative risk of 5.9 (CI 2.3–15.0).

**Conclusions** AEs were mild and transient, and severe or serious AEs were not observed.



**Adverse events during training**

Musculoskelet Sci Pract. 2017 Jun;29:20-27. doi: 10.1016/j.msksp.2017.02.009. Epub 2017 Mar 6.

**Adverse effects as a consequence of being the subject of orthopaedic manual therapy training, a worldwide retrospective survey.**

Thoomes-de Graaf M<sup>1</sup>, Thoomes E<sup>2</sup>, Carlesso L<sup>3</sup>, Kerry R<sup>4</sup>, Rushton A<sup>5</sup>.

Author information

Abstract

**BACKGROUND:**

Physical therapists (PTs) use a range of manual therapy techniques developed to an advanced level through postgraduate orthopaedic manipulative physical therapy (OMPT) programmes. The aim of this study was to describe the adverse effects experienced by students after having techniques performed on them as part of their OMPT training.

**DESIGN:**

A descriptive online survey of current students and recent graduates ( $\leq 5$  years) of OMPT programmes across the 22 Member Organisations of the International Federation of Orthopaedic Manipulative Physical Therapists.

**RESULTS:**

The questionnaire was completed by 1640 respondents across 22 countries (1263 graduates, 377 students). Some 60% of respondents reported never having experienced adverse effects during their manual therapy training. Of the 40% who did, 66.4% reported neck pain, 50.9% headache and 32% low back pain. Most reports of neck pain started after a manipulation and/or mobilisation, of which 53.4% lasted  $\leq 24$  h, 38.1%  $> 24$  h but  $< 3$  months and 13.7% still experienced neck pain to date. A small percentage of respondents (3.3%) reported knowing of a fellow student experiencing a major adverse effect.

**CONCLUSION:**

Mild to moderate adverse effects after practising manual therapy techniques are commonly reported, but usually resolve within 24 h. However, this survey has identified the reported occurrence of major adverse effects that warrant further investigation.

**Mulligan helps**

J Chiropr Med. 2017 Jun;16(2):94-102. doi: 10.1016/j.jcm.2017.01.003. Epub 2017 Mar 30.

**Effect of Mulligan Concept Lumbar SNAG on Chronic Nonspecific Low Back Pain.**

Hussien HM<sup>1</sup>, Abdel-Raouf NA<sup>1</sup>, Kattabei OM<sup>2</sup>, Ahmed HH<sup>1</sup>.

Author information

Abstract

**OBJECTIVE:**

The purpose of this study was to investigate the outcomes of adding lumbar sustained natural apophyseal glide (SNAG) to a conventional therapy program for chronic nonspecific low back pain (LBP).

**METHODS:**

Forty-two participants with chronic nonspecific LBP were randomly divided into 2 groups. The study group (aged  $27.1 \pm 8.3$ , 20 men, 3 women) received a conventional physical therapy program consisted of stretching and strengthening exercises plus SNAG (based on the Mulligan concept) on the affected lumbar levels, and the control group (aged  $28.9 \pm 7.7$ , 13 men, 6 women) received the same conventional program without SNAG 3 times per week for 1 month. Outcome measures were repositioning error (the primary outcome), pain, and function measured by an isokinetic dynamometer, visual analog scale, and the Oswestry Disability Index. Measurements were recorded before and after the end of the treatment period.

**RESULTS:**

The comparison between pretreatment and posttreatment test scores indicated that both study and control groups had significant improvement in all dependent variables ( $P > .001$ ). However, adding SNAG to the conventional program resulted in higher improvement in terms of repositioning error, pain, and function ( $P = .02, .002, .008$ ) respectively.

**CONCLUSIONS:**

This preliminary study indicated improvement in both groups. Adding SNAG to conventional programs in the treatment of chronic nonspecific LBP may result in greater improvement of repositioning error, pain reduction, and improved function.

**Adverse events**

Musculoskelet Sci Pract. 2017 Aug;30:34-41. doi: 10.1016/j.msksp.2017.05.002. Epub 2017 May 11.

**Predictive factors for reporting adverse events following spinal manipulation in randomized clinical trials - secondary analysis of a systematic review.**

Gorrell LM<sup>1</sup>, Brown B<sup>2</sup>, Lystad RP<sup>3</sup>, Engel RM<sup>4</sup>.

Author information

Abstract

While spinal manipulative therapy (SMT) is recommended for the treatment of spinal disorders, concerns exist about adverse events associated with the intervention.

Adequate reporting of adverse events in clinical trials would allow for more accurate estimations of incidence statistics through meta-analysis. However, it is not currently known if there are factors influencing adverse events reporting following SMT in randomized clinical trials (RCTs). Thus our objective was to investigate predictive factors for the reporting of adverse events in published RCTs involving SMT. The Physiotherapy Evidence Database (PEDro) and Cochrane Central Register of Controlled Trials (CENTRAL) were searched for RCTs involving SMT. Domains of interest included: sample size; publication date relative to the 2010 CONSORT statement; risk of bias; the region treated; and number of intervention sessions. 7398 records were identified, of which 368 articles were eligible for inclusion. A total of 140 (38.0%) articles reported on adverse events. Articles were more likely to report on adverse events if they possessed larger sample sizes, were published after the 2010 CONSORT statement, had a low risk of bias and involved multiple intervention sessions. The region treated was not a significant predictor for reporting on adverse events.

Predictors for reporting on adverse events included larger sample size, publication after the 2010 CONSORT statement, low risk of bias and trials involving multiple intervention sessions. We recommend that researchers focus on developing robust methodologies and participant follow-up regimens for RCTs involving SMT.

**Physiological changes from manipulations**

Musculoskelet Sci Pract. 2017 Jun;29:120-131. doi: 10.1016/j.msksp.2017.04.004. Epub 2017 Apr 5.

**Changes in biochemical markers following spinal manipulation-a systematic review and meta-analysis.**

Kovanur-Sampath K<sup>1</sup>, Mani R<sup>2</sup>, Cotter J<sup>3</sup>, Gisselman AS<sup>2</sup>, Tumilty S<sup>2</sup>.

Author information

Abstract

The aim of this meta-analysis was to determine the effectiveness of spinal manipulation in influencing various biochemical markers in healthy and or symptomatic population.

Electronic databases (n = 10) were searched (from inception till September 2016) and eight trials (325 participants) that met the inclusion criteria were included in the meta-analysis. Two authors independently extracted and assessed the risk of bias in included studies. Standardised mean differences for outcome measures were used to calculate effect sizes. The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) tool was used for assessing the quality of the body of evidence for each outcome of interest. There was moderate quality evidence that spinal manipulation influenced biochemical markers. There was moderate quality evidence of significant difference that spinal manipulation is better (SMD -0.46, 95% CI -0.93 to 0) than control in eliciting changes in cortisol levels immediately after intervention.

There was also a low quality evidence that spinal manipulation is better than control at post-intervention in increasing substance-P (SMD -0.48,95%CI-0.87 to -0.1), neurotensin (SMD -1.8,95%CI-2.56 to -1.04) and oxytocin levels (SMD -2.61,95%CI-3.5to-1.72). However, low quality evidence indicated that spinal manipulation did not influence epinephrine (SMD 0.1,95%CI- 0.56to0.75) or nor-epinephrine levels (SMD -0.06,95%CI-0.71to0.6).

The current review found that spinal manipulation can increase substance-p, neurotensin, oxytocin and interleukin levels and may influence cortisol levels post-intervention. However, future trials targeting symptomatic populations are required to understand the clinical importance of such changes.

**45 B. MANUAL THERAPY CERVICAL****PT helps tinnitus**

Musculoskelet Sci Pract. 2017 Jun;29:33-37. doi: 10.1016/j.msksp.2017.02.008. Epub 2017 Mar 6.

**Prognostic indicators for decrease in tinnitus severity after cervical physical therapy in patients with cervicogenic somatic tinnitus.**

Michiels S<sup>1</sup>, Van de Heyning P<sup>2</sup>, Truijjen S<sup>3</sup>, Halleman A<sup>4</sup>, De Hertogh W<sup>5</sup>.

Author information

Abstract

**BACKGROUND:**

Tinnitus can be related to many different aetiologies such as hearing loss or a noise trauma, but it can also be related to the somatosensory system of the cervical spine, called cervicogenic somatic tinnitus(CST). Recently, a positive effect of multi-modal cervical physical therapy on tinnitus severity in patients with CST was demonstrated. To date however, the outcome of the intervention cannot be predicted.

**OBJECTIVE:**

To identify prognostic indicators for decrease in tinnitus severity after cervical physical therapy in patients with CST.

**PATIENTS:**

Patients with moderate to severe subjective tinnitus (Tinnitus Functional Index(TFI):25-90points) and neck complaints (Neck Bournemouth Questionnaire(NBQ) > 14points).

**INTERVENTION:**

All patients received multimodal cervical physical therapy for 6 weeks (12 sessions). This physical therapy contained a combination of manual mobilizations and exercises of the cervical spine.

**MEASUREMENTS:**

TFI and NBQ-scores were documented at baseline, after treatment and after a 6-weeks follow-up period. Impairments in cervical spine mobility and muscle function were identified at baseline and after 6-weeks follow-up.

**RESULTS:**

Patients with co-varying (increasing or decreasing simultaneously) tinnitus and neck complaints had significantly lower TFI-scores after treatment ( $p = 0.001$ ) and follow-up ( $p = 0.03$ ). The presence of this co-variation and a combination of low pitched tinnitus and increasing tinnitus during inadequate cervical spine postures are prognostic indicators for a decrease in TFI-scores after cervical physical therapy (adjusted  $R^2 = 0.357$ ).

**CONCLUSION:**

Patients who experience a decrease in tinnitus annoyance from cervical physical therapy are those with co-varying tinnitus and neck complaints and those with a combination of low-pitched tinnitus and increasing tinnitus during inadequate cervical spine postures.

**45 D. MANUAL THERAPY EXTREMITIES****CT manipulation helps shoulder impingement**

J Chiropr Med. 2017 Jun;16(2):85-93. doi: 10.1016/j.jcm.2016.10.002. Epub 2016 Nov 24.

**A Preliminary Randomized Clinical Trial on the Effect of Cervicothoracic Manipulation Plus Supervised Exercises vs a Home Exercise Program for the Treatment of Shoulder Impingement.**

Vinuesa-Montoya S<sup>1</sup>, Aguilar-Ferrández ME<sup>2</sup>, Matarán-Peñarrocha GA<sup>3</sup>, Fernández-Sánchez M<sup>4</sup>, Fernández-Espinar EM<sup>5</sup>, Castro-Sánchez AM<sup>4</sup>.

Author information

Abstract

**OBJECTIVE:**

The purpose of this study was to investigate changes in pain, disability, and range of movement after cervicothoracic manipulation plus exercise therapy in individuals with unilateral shoulder impingement syndrome.

**METHODS:**

Forty-one patients (30 men, 11 women; aged  $47 \pm 9$ ) diagnosed with unilateral shoulder impingement syndrome attended 10 sessions for 5 weeks (2 sessions/wk). Eligible patients were randomly allocated to 2 study groups: cervicothoracic manipulation plus exercise therapy ( $n = 21$ ) or home exercise program ( $n = 20$ ). The outcomes measures included the visual analog scale (VAS); the Disabilities of the Arm, Shoulder, and Hand score; Shoulder Disability Questionnaire; subacromial impingement syndrome (Hawkins-Kennedy Test and Neer Test); and shoulder active range of motion (movements of flexion, extension, rotation, adduction, and abduction). Assessments were applied at baseline and 24 hours after completing 5 weeks of related interventions.

**RESULTS:**

After 5 weeks of treatment significant between-group differences were observed in the Disabilities of the Arm, Shoulder, and Hand score ( $P = .012$ ); however, no statistically significant differences were achieved for Shoulder Disability Questionnaire ( $P = .061$ ) and pain intensity ( $P = .859$ ). Both groups improved with regard to disability and clinical tests for detecting subacromial impingement syndrome.

**CONCLUSIONS:**

This clinical trial suggests that cervicothoracic manipulative treatment with mobilization plus exercise therapy may improve intensity of pain and range of motion compared with the home exercise group alone; the home exercise group had significant changes for flexion, extension, adduction, and abduction, but not for external and internal rotation movement in patients with shoulder impingement.

**47. STRETCHING/MUSCLES****Analysis**

Hum Mov Sci. 2017 May 17;54:220-229. doi: 10.1016/j.humov.2017.05.006.

**Influence of chronic stretching on muscle performance: Systematic review.**

Medeiros DM<sup>1</sup>, Lima CS<sup>2</sup>.

Author information

Abstract

The aim of the current study was to investigate the influence of chronic stretching on muscle performance (MP) by a systematic review.

The search strategy included MEDLINE, PEDro, Cochrane CENTRAL, LILACS, and manual search from inception to June 2016. Randomized and controlled clinical trials, non-randomized, and single group studies that have analyzed the influence of flexibility training (FT) (using any stretching technique) on MP were included. Differently, studies with special populations (children, elderly, and people with any dysfunction/disease), and articles that have used FT protocols shorter than three weeks or 12 sessions were excluded. The MP assessment could have been performed by functional tests (e.g. jump, sprint, stretch-shortening cycle tasks), isometric contractions, and/or isotonic contractions. Twenty-eight studies were included out of 513. Seven studies evaluated MP by stretch-shortening cycle tasks, Ten studies evaluated MP by isometric contractions, and 13 studies assessed MP by isotonic contractions.

We were unable to perform a meta-analysis due to the high heterogeneity among the included studies. In an individual study level analysis, we identified that 14 studies found positive effects of chronic stretching on MP. The improvements were observed only in functional tests and isotonic contractions, isometric contractions were not affected by FT. Therefore, FT might have an influence on dynamic MP. However, more studies are necessary to confirm whether FT can positively affect MP.

**48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE****Twitch response****June 2017** Volume 103, Issue 2, Pages 131–137**The association between dry needling-induced twitch response and change in pain and muscle function in patients with low back pain: a quasi-experimental study**

Shane L. Koppenhaver Cesar Fernández-de-las-Peñas Jeffrey J. Hebert

DOI: <http://dx.doi.org/10.1016/j.physio.2016.05.002>**Objective**

To investigate the relationship between dry needling-induced twitch response and change in pain, disability, nociceptive sensitivity, and lumbar multifidus muscle function, in patients with low back pain (LBP).

**Design**

Quasi-experimental study.

**Setting**

Department of Defense Academic Institution.

**Participants**

Sixty-six patients with mechanical LBP (38 men, 28 women, age: 41.3 [9.2] years).

**Interventions**

Dry needling treatment to the lumbar multifidus muscles between L3 and L5 bilaterally.

**Main outcome measures**

Examination procedures included numeric pain rating, the Modified Oswestry Disability Index, pressure algometry, and real-time ultrasound imaging assessment of lumbar multifidus muscle function before and after dry needling treatment. Pain pressure threshold (PPT) was used to measure nociceptive sensitivity. The percent change in muscle thickness from rest to contraction was calculated to represent muscle function. Participants were dichotomized and compared based on whether or not they experienced at least one twitch response on the most painful side and spinal level during dry needling.

**Results**

Participants experiencing local twitch response during dry needling exhibited greater immediate improvement in lumbar multifidus muscle function than participants who did not experience a twitch (thickness change with twitch: 12.4 [6]%, thickness change without twitch: 5.7 [11]%, mean difference adjusted for baseline value, 95%CI: 4.4 [1 to 8]%). However, this difference was not present after 1-week, and there were no between-groups differences in disability, pain intensity, or nociceptive sensitivity.

**Conclusions**

The twitch response during dry needling might be clinically relevant, but should not be considered necessary for successful treatment.



**48 C. MUSCLES****Changes in muscles in pain**

Musculoskelet Sci Pract. 2017 Jun;29:43-51. doi: 10.1016/j.msksp.2017.02.007. Epub 2017 Mar 6.

**Morphological and physiological differences in the upper trapezius muscle in patients with work-related trapezius myalgia compared to healthy controls: A systematic review.**

De Meulemeester K<sup>1</sup>, Calders P<sup>2</sup>, De Pauw R<sup>3</sup>, Grymonpon I<sup>4</sup>, Govaerts A<sup>5</sup>, Cagnie B<sup>6</sup>.

Author information

Abstract

**BACKGROUND:**

Trapezius myalgia is a common musculoskeletal complaint, characterized by pain, stiffness and tightness of the upper trapezius muscle. It is often work-related and caused by prolonged static and repetitive work tasks. It is hypothesized that this leads to various morphological and physiological alterations in muscle tissue but the pathophysiology is poorly understood. These alterations can be investigated by analysing muscle biopsies in order to reveal the underlying cellular mechanisms.

**OBJECTIVES:**

This systematic review aimed at providing a summary of the existing literature regarding morphological and physiological differences between people with work-related trapezius myalgia and healthy controls, obtained by analysing muscle biopsies.

**DESIGN:**

Systematic review.

**METHODS:**

A systematic literature search was performed in following databases: Pubmed, Web of Science and Embase by using different keyword combinations. This systematic review is reported following the PRISMA guidelines.

**RESULTS:**

Generally, low to moderate evidence was found for the absence of differences in muscle morphology in people with trapezius myalgia, compared to healthy controls. However, significant differences were mainly found in comparison with the control group with another occupation than the myalgic group. It can thus be hypothesized that morphological alterations in muscle tissue are related to work load and not to pain. Low to moderate evidence was also found for the absence of differences at the physiological level.

**CONCLUSIONS:**

Based on this systematic review, there are no clear differences in muscle morphology and physiology between subjects with trapezius myalgia and healthy controls.

**49. STRETCHING****Dynamic vs static**

Int. Journal of Sports Physical Therapy

Int J Sports Phys Ther. 2017 Jun;12(3):305-313.

**DYNAMIC OSCILLATORY STRETCHING EFFICACY ON HAMSTRING EXTENSIBILITY AND STRETCH TOLERANCE: A RANDOMIZED CONTROLLED TRIAL.**

Michaeli A<sup>1</sup>, Tee JC<sup>2</sup>, Stewart A<sup>3</sup>.

**Author information****Abstract****BACKGROUND:**

While static stretch (SS), proprioceptive neuromuscular facilitation (PNF) and oscillatory physiological mobilization techniques are documented to have positive effects on a range of motion (ROM), there are no reports on the effect of dynamicoscillatory stretching (DOS), a technique that combines these three techniques, on hamstring extensibility.

**PURPOSE:**

To determine whether DOS improves hamstring extensibility and stretch tolerance to a greater degree than SS in asymptomatic young participants.

**STUDY DESIGN:**

Randomized Controlled Trial.

**METHODS:**

Sixty participants (47 females, 13 males, mean age  $22 \pm 1$  years, height  $166 \pm 6$  centimeters, body mass  $67.6 \pm 9.7$  kg) completed a passive straight leg (SLR) to establish hamstring extensibility and stretch tolerance as perceived by participants, using a visual analogue scale (VAS). Participants were randomly assigned to one of two treatment groups (SS or DOS) or a placebo control (20 per group). Tests were repeated immediately following and one hour after each intervention. Data were assessed using a two-way repeated measure analysis of variance (ANOVA) and *Tukey's post hoc* test.

**RESULTS:**

Immediately post-intervention, there was a significant improvement in the hamstring extensibility as measured by the SLR in both the SS and DOS groups, with the DOS group exhibiting a significantly greater increase than the SS group (Control  $73 \pm 12^\circ$ , SS  $86 \pm 8^\circ$ , DOS  $94 \pm 11^\circ$ ,  $p < 0.001$ ). One hour post-intervention, hamstring extensibility in the DOS group remained elevated, while the SS group no longer differed from the control group (Control  $73 \pm 12^\circ$ , SS  $80 \pm 8^\circ$ , DOS  $89 \pm 12^\circ$ ,  $p = 0.001$ ). Furthermore, the stretchtolerance remained significantly elevated for the SS group, but there was no difference between the control and DOS groups, (Control  $4.6 \pm 1.3$ , SS  $5.9 \pm 0.8$ , DOS  $4.3 \pm 1.0$  AU,  $p < 0.001$ ).

**CONCLUSION:**

DOS was more effective than SS at achieving an immediate increase in hamstring extensibility, and DOS demonstrated an increased stretch tolerance one-hour post-intervention.

**LEVEL OF EVIDENCE:**

2C.

**KEYWORDS:**

Dynamic oscillatory stretching; hamstring extensibility; stretch tolerance

### 52. EXERCISE

#### Exercise and fear

#### **Exercise therapy for chronic musculoskeletal pain: Innovation by altering pain memories.**

Nijs J, et al. Man Ther. 2015.

#### **Abstract**

Even though nociceptive pathology has often long subsided, the brain of patients with chronic musculoskeletal pain has typically acquired a protective (movement-related) pain memory.

Exercise therapy for patients with chronic musculoskeletal pain is often hampered by such pain memories. Here the authors explain how musculoskeletal therapists can alter pain memories in patients with chronic musculoskeletal pain, by integrating pain neuroscience education with exercise interventions. The latter includes applying graded exposure in vivo principles during exercise therapy, for targeting the brain circuitries orchestrated by the amygdala (the memory of fear centre in the brain). Before initiating exercise therapy, a preparatory phase of intensive pain neuroscience education is required. Next, exercise therapy can address movement-related pain memories by applying the 'exposure without danger' principle. By addressing patients' perceptions about exercises, therapists should try to decrease the anticipated danger (threat level) of the exercises by challenging the nature of, and reasoning behind their fears, assuring the safety of the exercises, and increasing confidence in a successful accomplishment of the exercise.

This way, exercise therapy accounts for the current understanding of pain neuroscience, including the mechanisms of central sensitization.

**Yoga and joint pain**

Rheumatol Int. 2017 Jul;37(7):1145-1148. doi: Epub 2017 May 22.

**Associations between yoga practice and joint problems: a cross-sectional survey among 9151 Australian women.**

Lauche R<sup>1</sup>, Schumann D<sup>2</sup>, Sibbritt D<sup>3</sup>, Adams J<sup>3</sup>, Cramer H<sup>3,2</sup>.

**Abstract**

Yoga exercises have been associated with joint problems recently, indicating that yoga practice might be potentially dangerous for joint health.

This study aimed to analyse whether regular yoga practice is associated with the frequency of joint problems in upper middle-aged Australian women. Women aged 62-67 years from the Australian Longitudinal Study on Women's Health (ALSWH) were questioned in 2013 whether they experienced regular joint pain or problems in the past 12 months and whether they regularly practiced yoga. Associations of joint problems with yoga practice were analysed using Chi-squared tests and multiple logistic regression modelling. Of 9151 women, 29.8% reported regular problems with stiff or painful joints, and 15.2, 11.9, 18.1 and 15.9% reported regular problems with shoulders, hips, knees and feet, respectively, in the past 12 months. Yoga was practiced sometimes by 10.1% and often by 8.4% of women. Practicing yoga was not associated with upper or lower limb joint problems.

No association between yoga practice and joint problems has been identified. Further studies are warranted for conclusive judgement of benefits and safety of yoga in relation to joint problems.

**KEYWORDS:**

Joint problems; Safety; Women's health; Yoga

### Yoga and neurological patients

J Clin Neurosci. 2017 Jun 6.

#### **Evidence based effects of yoga in neurological disorders.**

Mooventhan A<sup>1</sup>, Nivethitha L<sup>2</sup>.

#### **Abstract**

Though yoga is one of the widely used mind-body medicine for health promotion, disease prevention and as a possible treatment modality for neurological disorders, there is a lack of evidence-based review. Hence, we performed a comprehensive search in the PubMed/Medline electronic database to review relevant articles in English, using keywords "yoga and neurological disorder, yoga and multiple sclerosis, yoga and stroke, yoga and epilepsy, yoga and Parkinson's disease, yoga and dementia, yoga and cerebrovascular disease, yoga and Alzheimer disease, yoga and neuropathy, yoga and myelopathy, and yoga and Guillain-Barre syndrome". A total of 700 articles published from 1963 to 14th December 2016 were available. Of 700 articles, 94 articles were included in this review.

Based on the available literature, it could be concluded that yoga might be considered as an effective adjuvant for the patients with various neurological disorders.

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**KEYWORDS:** Neurological disorder; Review; Yoga

### 59. PAIN

#### Exercise and pain

##### **Exercise therapy for chronic musculoskeletal pain: Innovation by altering pain memories.**

Nijs J, et al.  
Man Ther. 2015.

Even though nociceptive pathology has often long subsided, the brain of patients with chronic musculoskeletal pain has typically acquired a protective (movement-related) pain memory.

Exercise therapy for patients with chronic musculoskeletal pain is often hampered by such pain memories. Here the authors explain how musculoskeletal therapists can alter pain memories in patients with chronic musculoskeletal pain, by integrating pain neuroscience education with exercise interventions. The latter includes applying graded exposure in vivo principles during exercise therapy, for targeting the brain circuitries orchestrated by the amygdala (the memory of fear centre in the brain). Before initiating exercise therapy, a preparatory phase of intensive pain neuroscience education is required. Next, exercise therapy can address movement-related pain memories by applying the 'exposure without danger' principle. By addressing patients' perceptions about exercises, therapists should try to decrease the anticipated danger (threat level) of the exercises by challenging the nature of, and reasoning behind their fears, assuring the safety of the exercises, and increasing confidence in a successful accomplishment of the exercise.

This way, exercise therapy accounts for the current understanding of pain neuroscience, including the mechanisms of central sensitization.

**Conversion disorder**

Curr Pain Headache Rep. 2017 Jun;21(6):29. doi: 10.1007/s11916-017-0627-7.

**Conversion Disorder, Functional Neurological Symptom Disorder, and Chronic Pain: Comorbidity, Assessment, and Treatment.**

Tsui P<sup>1</sup>, Deptula A<sup>2</sup>, Yuan DY<sup>3</sup>.

Author information

Abstract

*PURPOSE OF REVIEW:*

This paper examines the overlap of conversion disorder with chronic pain conditions, describes ways to assess for conversion disorder, and provides an overview of evidence-based treatments for conversion disorder and chronic pain, with a focus on conversion symptoms.

*RECENT FINDINGS:*

Conversion disorder is a significant problem that warrants further study, given that there are not many well-established guidelines. Accurate and timely assessment should help move treatment in a more fruitful direction and avoid unnecessary medical interventions. Advances in neuroimaging may also help further our understanding of conversion disorder. Creating a supportive environment and a collaborative treatment relationship and improving understanding of conversion symptoms appear to help individuals diagnosed with conversion disorder engage in appropriate treatments. Novel uses of earlier treatments, such as hypnosis and psychodynamic approaches, could potentially be beneficial and require a more vigorous and systematic study. There are treatments that produce significant improvements in functioning and reduction of physical symptoms from conversion disorder even for very severe cases. Hypnotherapy, cognitive behavioral therapy, and inpatient multidisciplinary treatment with intensive physiotherapy for severe cases have the most evidence to support reduction of symptoms. Components of treatment for conversion disorder overlap with treatments for chronic pain and can be used together to produce therapeutic effects for both conditions. Treatment needs to be tailored for each individual's specific symptoms.

**Chronic pain and aerobic exercise**

Int J Rehabil Res. 2017 Jun;40(2):164-170. doi: 10.1097/MRR.0000000000000212.

**Effects of aerobic exercise on pain sensitivity, heart rate recovery, and health-related quality of life in patients with chronic musculoskeletal pain.**

Öte Karaca Ş<sup>1</sup>, Demirsoy N, Günendi Z.

Author information

Abstract

We aimed to investigate the effects of aerobic exercise on pain perception, sensitivity, and health-related quality of life; to assess its effect on parasympathetic tonus by analysis of heart rate recovery; and to examine the effects of parasympathetic tone on pain sensitivity in patients with chronic musculoskeletal pain.

Fifty patients with chronic musculoskeletal pain were randomized into two groups: control group (C group) and aerobic exercise group (AE group). Both groups received conventional physical therapy for 2 weeks; the AE group performed submaximal aerobic exercise on a treadmill for 30 min additionally. Exercise test, pressure-pain threshold measurement, short form-36, and visual analog scale were administered initially and finally for evaluation. Visual analog scale scores in both groups decreased significantly after treatment ( $P < 0.001$ ). Pressure-pain threshold sum increased significantly in the AE group, remaining unchanged in the C group. Increase in exercise test duration was significant in the AE group compared with the C group ( $P = 0.0002$ ).

Heart rate recovery did not change with therapy in the groups. For short form-36, the AE group showed alterations in role limitations because of physical problems and general health perceptions; both groups showed a significant improvement in the physical function and bodily pain subscales, but mental health significantly improved only in C group. Short-term aerobic exercise along with conventional physical therapy decreased pain sensitivity and increased aerobic capacity, with significant improvements in health-related quality of life.



## Chronic pain and dementia

### Association between persistent pain and memory decline and dementia

JAMA Internal Medicine

Whitlock EL, et al.

The point of this research was to investigate the population-level relation between persistent pain, which possibly reflected chronic pain, and subsequent cognitive decline. It was surmised that persistent pain correlated with accelerated memory decline and increased probability of dementia.

#### Methods

- The design of this research was a cohort study with biennial interviews.
- The enrollment consisted of 10065 community-dwelling older adults, in the nationally representative Health and Retirement Study.
- The participants were 62 years or older, in 2000 and answered pain and cognition questions, during 1998 and 2000.
- Data analysis was carried out between June 24 and October 31, 2016.
- The exposure consisted of “persistent pain,” defined as a participant reporting that he or she was often troubled with moderate or severe pain, in both the 1998 and 2000 interviews.
- Coprimary outcomes were composite memory score and dementia probability, evaluated by combining neuropsychological test results and informant and proxy interviews, which were tracked from 2000 through 2012.
- Linear mixed-effects models, with random slope and intercept for each participant, measured the correlation of persistent pain with slope of the subsequent cognitive trajectory, adjusting for demographic characteristics and comorbidities measures in 2000.
- Sampling weights were applied to represent the 2000 US population.
- The hypothesis presented was that persistent pain would predict accelerated memory decline and increased probability of dementia.
- To quantify the impact of persistent pain on functional independence, the primary results were combined with information about the link between memory and ability to manage medications and finances independently.

#### Results

- Among the 10065 HRS sample members, 60% were female, and median baseline age was 73 years (interquartile range, 67-78 years).
- At baseline, persistent pain affected 10.9% of members. It was linked with worse depressive symptoms and more limitations in activities of daily living.
- After covariate adjustment, persistent pain correlated with 9.2% (95% CI, 2.8%-15.0%) more rapid memory decline compared with those without persistent pain.
- After 10 years, this accelerated memory decline accounted for a 15.9% higher relative risk of inability to manage medications and an 11.8% higher relative risk of inability to manage finances independently.
- Adjusted dementia probability increased 7.7% faster (95% CI, 0.55%-14.2%).
- After 10 years, this translated to an absolute 2.2% increase in dementia probability for those with persistent pain.

**60. COMPLEX REGIONAL PAIN****Hypnosis and PT**

Hand Surg Rehabil. 2017 Jun;36(3):215-221. doi: 10.1016/j.hansur.2016.12.008. Epub 2017 Mar 1.

**Physical therapy under hypnosis for the treatment of patients with type 1 complex regional pain syndrome of the hand and wrist: Retrospective study of 20 cases.**

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Author information

Abstract

Type 1 complex regional painful syndrome (CRPS-1) has a complex physiopathology. The aim of this study was to evaluate the effectiveness of physical therapy under hypnotherapy to treat this condition. Twenty patients with CRPS-1 at the wrist and hand were evaluated retrospectively: 13 women and 7 men with an average age of 56 years (34-75). Thirteen patients were in the inflammatory phase and 7 in the dystrophic phase. The main endpoints were pain (VAS, analgesic use), stiffness (wrist and finger range of motion), and strength (pinch and grasp). Secondary endpoints were functional scores (QuickDASH, PWRE), patient satisfaction, return to work, and side effects. Results were satisfactory in all cases after 5.4 sessions on average. VAS decreased by 4 points, PWRE-pain by 4.1 points, and analgesic use was limited to paracetamol upon request. Finger and wrist range of motion increased and the QuickDASH decreased by 34 points, PRWE-function by 3.8 points, pinch strength increased 4 points, and grasp strength by 10 points. Return to work was possible in 80% of the cases. All patients were satisfied or very satisfied with the treatment. Physical therapy under hypnosis appears to be an effective treatment for CRPS-1 at the wrist and hand no matter the etiology.

## 61. FIBROMYALGIA

### Pressure and thermal pain sensitivity

Clin Rheumatol. 2017 Jun;36(6):1427-1432. doi: 10.1007/s10067-017-3557-1. Epub 2017 Feb 4.

#### **Pain extent is associated with pain intensity but not with widespread pressure or thermal pain sensitivity in women with fibromyalgia syndrome.**

Barbero M<sup>1</sup>, Fernández-de-Las-Peñas C<sup>2,3,4</sup>, Palacios-Ceña M<sup>5,6</sup>, Cescon C<sup>1</sup>, Falla D<sup>7</sup>.

Author information

Abstract

Widespread pain is considered a sign of central sensitization in people with chronic pain.

Our aim was to examine whether pain extent, assessed from the pain drawing, relates to measures from quantitative sensory testing in fibromyalgia syndrome (FMS). Thirty women with FMS and no other co-morbid conditions completed pain drawings (dorsal and ventral views) and clinical and related disability questionnaires.

Pain extent and pain frequency maps were obtained from the pain drawings using a novel customized software. Pressure pain thresholds were assessed over the 18 tender points considered by the 1990 American College of Rheumatology criteria for FMS diagnosis and over two additional standardized points. Heat and cold pain thresholds were also assessed on the dorsal aspect of the neck, the dorsal aspect of the wrist, and the tibialis anterior. Spearman's correlation coefficients were used to assess the relationship between pain extent and quantitative sensory testing outcomes as well as clinical symptoms. Larger extent of pain was associated with a higher pain intensity (dorsal area:  $r_s = 0.461$ ,  $P = 0.010$ ; total area:  $r_s = 0.593$ ,  $P = 0.001$ ), younger age (ventral area:  $r_s = -0.544$ ,  $P = 0.002$ ; total area:  $r_s = -0.409$ ,  $P = 0.025$ ), shorter history of pain (ventral area:  $r_s = -0.367$ ,  $P = 0.046$ ), and higher cold pain thresholds over the tibialis anterior muscle ( $r_s = -0.406$ ,  $P = 0.001$ ).

No significant association was observed between pain extent and the remaining outcomes. Pain drawings constitute an easy and accurate approach to quantify widespread pain. Larger pain extent is associated with pain intensity but not with signs of central sensitization in women with FMS.

## Gluten free diet

J Clin Gastroenterol. 2017 Jul;51(6):500-507

**The Effects of a Gluten-free Diet Versus a Hypocaloric Diet Among Patients With Fibromyalgia Experiencing Gluten Sensitivity-like Symptoms: A Pilot, Open-Label Randomized Clinical Trial.**

Slim M<sup>1</sup>, Calandre EP, Garcia-Leiva JM, Rico-Villademoros F, Molina-Barea R, Rodriguez-Lopez CM, Morillas-Arques P.

**Abstract**

**BACKGROUND AND AIMS:**

Patients with fibromyalgia frequently present with symptoms similar to those experienced by patients with gluten-related disorders, raising the possibility that a subgroup of these patients could be experiencing underlying gluten sensitivity. This study aimed to evaluate the effects of a gluten-free diet (GFD) compared with a hypocaloric diet (HCD) among patients with fibromyalgia.

**METHODS:**

Adult patients diagnosed with fibromyalgia were randomly allocated to receive a GFD or a HCD over a 24-week period. The primary outcome measure was the change in the number of gluten sensitivity symptoms. The following secondary outcomes were evaluated: body mass index, Revised Fibromyalgia Impact Questionnaire, Pittsburgh Sleep Quality Index, Brief Pain Inventory, Beck Depression Inventory-II, State-Trait Anxiety Inventory, Short-Form Health Survey, Patient Global Impression Scale of Severity, Patient Global Impression Scale of Improvement, and adverse events.

**RESULTS:**

Seventy-five subjects were randomly allocated to receive either a GFD (n=35) or an HCD (n=40). The least squares mean change in the total number of gluten sensitivity symptoms from baseline did not differ significantly between the GFD and HCD groups (-2.44±0.40 for the GFD; -2.10±0.37 for the HCD; P=0.343). Similarly, the 2 dietary interventions did not differ in any of the remaining measured secondary outcomes. Both dietary interventions were well tolerated.

**CONCLUSIONS:**

Both dietary interventions were associated with similar beneficial outcomes in reducing gluten sensitivity symptoms and other secondary outcomes. However, despite its specificity, GFD was not superior to HCD in reducing the number of gluten sensitivity symptoms or secondary outcomes.

**Spondyloarthritis**

Curr Opin Rheumatol. 2017 Jul;29(4):304-310. doi: 10.1097/BOR.0000000000000388.

**Fibromyalgia, a missed comorbidity in spondyloarthritis: prevalence and impact on assessment and treatment.**

Mease PJ<sup>1</sup>.

Author information

Abstract

*PURPOSE OF REVIEW:*

Fibromyalgia is a clinical representation of the neurobiological phenomenon of central sensitization, characterized by chronic widespread pain, fatigue, sleep disturbance, and other symptoms. Fibromyalgia may occur in conjunction with chronic rheumatic diseases, driven by the effects of chronic pain and inflammation and likely influenced by the patient's genetic and psychoemotional background. This article reviews the data on prevalence of concomitant fibromyalgia and its impact on disease assessment in patients with spondyloarthritis (SpA) and psoriatic arthritis (PsA).

*RECENT FINDINGS:*

Fibromyalgia occurs in 2-8% of the general population. In AxSpA cohorts the prevalence has been reported in 4-25%, and in PsA, 16-22%, the majority being female. Measures of disease activity which are comprised partly or wholly of patient-reported outcomes such as pain and patient global are significantly higher in patients with concomitant fibromyalgia and do not improve as much with treatment as more objective measures, a finding which has been observed in other diseases such as rheumatoid arthritis and lupus.

*SUMMARY:*

Fibromyalgia occurs in a significant proportion of patients with SpA and PsA. Disease activity measures with subjective elements are conflated in patients with fibromyalgia and do not reliably assess true inflammatory disease. This needs to be taken into account when evaluating the impact of immunomodulatory therapy.

**62 A. NUTRITION/VITAMINS****Diet and cancer**

Prev Med. 2017 Jun 7;101:178-187.

**Diet quality is associated with reduced incidence of cancer and self-reported chronic disease: Observations from Alberta's Tomorrow Project.**

Solbak NM<sup>1</sup>, Xu JY<sup>2</sup>, Vena JE<sup>2</sup>, Csizmadi I<sup>3</sup>, Whelan HK<sup>2</sup>, Robson PJ<sup>4</sup>.

**Abstract**

The objective of this study was to assess diet quality using the Healthy Eating Index-2005 Canada (HEI-2005-Canada) and its association with risk of cancer and chronic disease in a sample of Alberta's Tomorrow Project (ATP) participants.

Food frequency questionnaires completed by 25,169 participants (38% men; mean age 50.3 (9.2)) enrolled between 2000 and 2008 were used to calculate HEI-2005-Canada scores. Data from a subset of participants (n=10,735) who reported no chronic disease at enrollment were used to investigate the association between HEI-2005-Canada score and development of self-reported chronic disease at follow-up (2008). Participants were divided into HEI-2005-Canada score quartiles. Cox proportional hazards models were used to estimate hazard ratios (HR) and 95% confidence intervals (CI) for cancer and chronic disease incidence. In this cohort, mean HEI-2005-Canada scores for men and women were 50.9 and 55.5 (maximum range 0-100), respectively. In men, higher HEI-2005-Canada score (Q4 vs. Q1) was associated with lower cancer risk (HR (95% CI) 0.63 (0.49-0.83)) over the course of follow-up (mean (SD)=10.4 (2.3) years); the same was not observed in women. In contrast, higher overall HEI-2005-Canada score (Q4 vs. Q1) was associated with lower risk of self-reported chronic disease (0.85 (0.75-0.97)) in both men and women over follow-up (4.2 (2.3) years).

In conclusion, in this cohort better diet quality was associated with a lower risk of cancer in men and lower risk of chronic disease in both sexes. Future studies with longer follow-up and repeated measures of diet may be helpful to elucidate sex-specific associations between dietary quality and disease outcomes.