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## 2. LBP

### Questionnaire for avoidance

Clin J Pain. 2016 Nov;32(11):940-947.

#### **Development and Validation of the Behavioral Avoidance Test-Back Pain (BAT-Back) for Patients With Chronic Low Back Pain.**

Holzappel S<sup>1</sup>, Riecke J, Rief W, Schneider J, Glombiewski JA.

##### **OBJECTIVES:**

Pain-related fear and avoidance of physical activities are central elements of the fear-avoidance model of musculoskeletal pain. Pain-related fear has typically been measured by self-report instruments. In this study, we developed and validated a Behavioral Avoidance Test (BAT) for chronic low back pain (CLBP) patients with the aim of assessing pain-related avoidance behavior by direct observation.

##### **MATERIALS AND METHODS:**

The BAT-Back was administered to a group of CLBP patients (N=97) and pain-free controls (N=31). Furthermore, pain, pain-related fear, disability, catastrophizing, and avoidance behavior were measured using self-report instruments. Reliability was assessed with intraclass correlation coefficient and Cronbach  $\alpha$ . Validity was assessed by examining correlation and regression analysis.

##### **RESULTS:**

The intraclass correlation coefficient for the BAT-Back avoidance score was  $r=0.76$ . Internal consistency was  $\alpha=0.95$ . CLBP patients and controls differed significantly on BAT-Back avoidance scores as well as self-report measures. BAT-Back avoidance scores were significantly correlated with scores on each of the self-report measures ( $r_s=0.27$  to  $0.54$ ). They were not significantly correlated with general anxiety and depression, age, body mass index, and pain duration. The BAT-Back avoidance score was able to capture unique variance in disability after controlling for other variables (eg, pain intensity and pain-related fear).

##### **DISCUSSION:**

Results indicate that the BAT-Back is a reliable and valid measure of pain-related avoidance behavior. It may be useful for clinicians in tailoring treatments for chronic pain as well as an outcome measure for exposure treatments.

**Leg pain and BMI****The association between body mass index (BMI) and back or leg pain in patients with spinal conditions: Results from the Genodisc Study**

Spine, 10/14/2016

Segar AH, et al.

**Study Design.** A prospective observational study.

**Objective.** The aim of this study was to identify the relationship between obesity, quantified by body mass index (BMI), and both back and leg pain in spinal patients.

**Summary of Background Data.** Obesity and back pain are massive public health problems. Given the poor correlation between pain and a pathological change in the spine, further investigation is required into other, nonpathological predictors such as obesity.

**Methods.** The Genodisc Study was one of the largest cross-sectional studies of patients presenting to tertiary spinal units and recruited from six centers in four European countries. In total, 2636 patients were recruited over a 5-year period between 2008 and 2013. Both back and leg pain were scored by patients in the range of 0 to 10. Linear regression was used to model the relationship between BMI and pain. Potential confounders included in the model were age, Zung Depression score, episodes of sport, gender, disability benefit, family history, previous surgery, smoking status, work type, clinical diagnosis, and relevant comorbidities. Back and leg pain outcomes were modeled separately.

**Results.** The study included 1160 men and 1349 women with a mean age of 50.9 years and mean BMI of 27.2 kg/m<sup>2</sup>. In our fully adjusted model, a 5-point increase in BMI was associated with greater leg [0.19 units (95% confidence interval 0.08–0.31)] but not back [0.10 units (95% CI –0.02 to 0.22)] pain scores. Although this relationship was statically significant, given the small magnitude of the relationship, the clinical significance is limited. Similarly, female gender, heavy workload, rheumatoid arthritis, previous spine surgery, and depression were associated with higher back and leg pain.

**Conclusion.** In this large observational study of spine patients presenting to tertiary European centers, obesity, as measured by increased BMI, was associated with greater leg pain.

Level of Evidence: 2

## 5. SURGERY

### Post op spondi

Eur Spine J. 2016 Sep 29.

#### **Quality of life and disability: can they be improved by active postoperative rehabilitation after spinal fusion surgery in patients with spondylolisthesis? A randomised controlled trial with 12-month follow-up.**

Ilves O<sup>1,2</sup>, Häkkinen A<sup>3,4</sup>, Dekker J<sup>5,6</sup>, Pekkanen L<sup>7</sup>, Piitulainen K<sup>3,4</sup>, Järvenpää S<sup>4</sup>, Marttinen I<sup>8</sup>, Vihtonen K<sup>8</sup>, Neva MH<sup>8</sup>.

#### **PURPOSE:**

The aim of the study was to investigate the effectiveness of the postoperative 12-month exercise program compared to usual care on disability and health-related quality of life (HRQoL) in patients after lumbar spine fusion surgery (LSF).

#### **METHODS:**

Altogether, 98 patients with isthmic (31) or degenerative (67) spondylolisthesis were randomised to exercise therapy group (EG) (n = 48) or usual care group (UCG) (n = 50) 3 months after LSF. EG patients had home-based progressive strength and aerobic training program for 12 months. UCG patients received only oral and written instructions of exercises. Oswestry Disability Index (ODI) and HRQoL (RAND-36) were evaluated at the time of randomization, at the end of the intervention and 1 year after intervention.

#### **RESULTS:**

The mean ODI score decreased from 24 (12) to 18 (14) in the EG and from 18 (12) to 13 (11) in the UCG during intervention (between-groups p = 0.69). At 1-year follow-up, 25 % of the EG and 28 % of the UCG had an ODI score  $\geq 20$ . No between-group differences in HRQoL change were found at any time point. The mean (95 % CI) physical functioning dimension of the HRQoL improved by 10.0 (4.6-15.3) in the EG and by 7.8 (2.5-13.0) in the UCG. In addition, the role physical score improved by 20.0 (7.7-32.3) in the EG and by 16.4 (4.4-28.4) in the UCG during the intervention.

#### **CONCLUSIONS:**

The exercise intervention did not have an impact on disability or HRQoL beyond the improvement achieved by usual care. However, disability remained at least moderate in considerable proportion of patients.

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Diet and birth size

Am J Clin Nutr. 2016 Oct 12. pii: ajcn133892.

**A vegetable, fruit, and white rice dietary pattern during pregnancy is associated with a lower risk of preterm birth and larger birth size in a multiethnic Asian cohort: the Growing Up in Singapore Towards healthy Outcomes (GUSTO) study.**

Chia AR<sup>1</sup>, de Seymour JV<sup>2</sup>, Colega M<sup>3</sup>, Chen LW<sup>1</sup>, Chan YH<sup>4</sup>, Aris IM<sup>3</sup>, Tint MT<sup>1</sup>, Quah PL<sup>3</sup>, Godfrey KM<sup>5</sup>, Yap F<sup>6</sup>, Saw SM<sup>7</sup>, Baker PN<sup>2</sup>, Chong YS<sup>8</sup>, van Dam RM<sup>9</sup>, Lee YS<sup>10</sup>, Chong MF<sup>11</sup>.

#### **BACKGROUND:**

Maternal dietary patterns during pregnancy have been shown to influence infant birth outcomes. However, to our knowledge, only a few studies have examined the associations in Asian populations.

#### **OBJECTIVE:**

We characterized maternal dietary patterns in Asian pregnant women and examined their associations with the risk of preterm birth and offspring birth size.

#### **DESIGN:**

At 26-28 wk of gestation, 24-h recalls and 3-d food diaries were collected from the women in the Growing Up in Singapore Towards healthy Outcomes mother-offspring cohort. Dietary patterns were derived from exploratory factor analysis. Gestational age was determined by a dating ultrasound scan in the first trimester, and infant birth anthropometric measurements were obtained from hospital records. Associations were assessed by logistic and linear regressions with adjustment for confounding factors.

#### **RESULTS:**

Three maternal dietary patterns were identified: vegetable, fruit, and white rice (VFR); seafood and noodle (SfN); and pasta, cheese, and processed meat (PCP). Of 923 infants, 7.6% were born preterm, 13.4% were born small for gestational age, and 14.7% were born large for gestational age. A greater adherence to the VFR pattern (per SD increase in VFR score) was associated with a lower risk of preterm births (OR: 0.67; 95% CI: 0.50, 0.91), higher ponderal index ( $\beta$ : 0.26 kg/m<sup>3</sup>; 95% CI: 0.06, 0.45 kg/m<sup>3</sup>), and increased risk of a large-for-gestational-age birth (RR: 1.31; 95% CI: 1.06, 1.62). No associations were observed for the SfN and PCP patterns in relation to birth outcomes.

#### **CONCLUSIONS:**

The VFR pattern is associated with a lower incidence of preterm birth and with larger birth size in an Asian population. The findings related to larger birth size warrant further confirmation in independent studies. This trial was registered at [clinicaltrials.gov](http://clinicaltrials.gov) as

**Fish consumption and breast CA**

BJOG. 2016 Oct 5. doi: 10.1111/1471-0528.14372.

**Vitamin D, pre-eclampsia, and preterm birth among pregnancies at high risk for pre-eclampsia: an analysis of data from a low-dose aspirin trial.**

Gernand AD<sup>1</sup>, Simhan HN<sup>2</sup>, Baca KM<sup>3</sup>, Caritis S<sup>4</sup>, Bodnar LM<sup>5</sup>.  
Author information

Abstract

**OBJECTIVE:**

To examine the relation between maternal vitamin D status and risk of pre-eclampsia and preterm birth in women at high risk for pre-eclampsia.

**DESIGN:**

Analysis of prospectively collected data and blood samples from a trial of prenatal low-dose aspirin.

**SETTING:**

Thirteen sites across the USA.

**POPULATION:**

Women at high risk for pre-eclampsia.

**METHODS:**

We measured 25-hydroxyvitamin D [25(OH)D] concentrations in stored maternal serum samples drawn at 12-26 weeks' gestation (n = 822). We used mixed effects models to examine the association between 25(OH)D and risk of pre-eclampsia and preterm birth, controlling for confounders including prepregnancy BMI and race.

**MAIN OUTCOME MEASURES:**

Pre-eclampsia and preterm birth.

**RESULTS:**

Twelve percent of women were vitamin D deficient [25(OH)D <30 nmol/l]. Women with 25(OH)D <30 versus  $\geq$ 75 nmol/l had a 2.4-fold (95% CI 1.0-5.6) higher risk of early-onset pre-eclampsia (<35 weeks' gestation) after confounder adjustment. Women with 25(OH)D <50 nmol/l had a 1.8-fold (95% CI 1.0-3.2) increased risk of preterm birth at <35 weeks compared with women who had 25(OH)D  $\geq$ 75 nmol/l, which was driven by indicated preterm births at <35 weeks' gestation [25(OH)D <50 versus  $\geq$ 75 nmol/l adjusted RR 2.5 (95% CI 1.1-5.8)]. There was no association between vitamin D status and pre-eclampsia or preterm birth at <37 weeks.

**CONCLUSION:**

Maternal vitamin D status in the second trimester was inversely associated with risk of early-onset pre-eclampsia and preterm birth at <35 weeks in women at high risk for pre-eclampsia.

**TWEETABLE ABSTRACT:**

Vitamin D is inversely related to risk of pre-eclampsia and preterm birth at <35 weeks in high-risk pregnancies.

## Depression and contraception

**Original Investigation**

September 28, 2016

Association of Hormonal Contraception With Depression

Charlotte Wessel Skovlund, MSc<sup>1</sup>; Lina Steinrud Mørch, PhD<sup>1</sup>; Lars Vedel Kessing, MD, DMSc<sup>2</sup>; et al Øjvind Lidegaard, MD, DMSc<sup>1</sup>*JAMA Psychiatry*. Published online September 28, 2016. doi:10.1001/jamapsychiatry.2016.2387

**Importance** Millions of women worldwide use hormonal contraception. Despite the clinical evidence of an influence of hormonal contraception on some women's mood, associations between the use of hormonal contraception and mood disturbances remain inadequately addressed.

**Objective** To investigate whether the use of hormonal contraception is positively associated with subsequent use of antidepressants and a diagnosis of depression at a psychiatric hospital.

**Design, Setting, and Participants** This nationwide prospective cohort study combined data from the National Prescription Register and the Psychiatric Central Research Register in Denmark. All women and adolescents aged 15 to 34 years who were living in Denmark were followed up from January 1, 2000, to December 2013, if they had no prior depression diagnosis, redeemed prescription for antidepressants, other major psychiatric diagnosis, cancer, venous thrombosis, or infertility treatment. Data were collected from January 1, 1995, to December 31, 2013, and analyzed from January 1, 2015, through April 1, 2016.

**Exposures** Use of different types of hormonal contraception.

**Main Outcomes and Measures** With time-varying covariates, adjusted incidence rate ratios (RRs) were calculated for first use of an antidepressant and first diagnosis of depression at a psychiatric hospital.

**Results** A total of 1 061 997 women (mean [SD] age, 24.4 [0.001] years; mean [SD] follow-up, 6.4 [0.004] years) were included in the analysis. Compared with nonusers, users of combined oral contraceptives had an RR of first use of an antidepressant of 1.23 (95% CI, 1.22-1.25). Users of progestogen-only pills had an RR for first use of an antidepressant of 1.34 (95% CI, 1.27-1.40); users of a patch (norgestrolmin), 2.0 (95% CI, 1.76-2.18); users of a vaginal ring (etonogestrel), 1.6 (95% CI, 1.55-1.69); and users of a levonorgestrel intrauterine system, 1.4 (95% CI, 1.31-1.42). For depression diagnoses, similar or slightly lower estimates were found. The relative risks generally decreased with increasing age. Adolescents (age range, 15-19 years) using combined oral contraceptives had an RR of a first use of an antidepressant of 1.8 (95% CI, 1.75-1.84) and those using progestin-only pills, 2.2 (95% CI, 1.99-2.52). Six months after starting use of hormonal contraceptives, the RR of antidepressant use peaked at 1.4 (95% CI, 1.34-1.46). When the reference group was changed to those who never used hormonal contraception, the RR estimates for users of combined oral contraceptives increased to 1.7 (95% CI, 1.66-1.71).

**Conclusions and Relevance** Use of hormonal contraception, especially among adolescents, was associated with subsequent use of antidepressants and a first diagnosis of depression, suggesting depression as a potential adverse effect of hormonal contraceptive use.

**Vit. D and preterm**

BJOG. 2016 Oct 5. doi: 10.1111/1471-0528.14372.

**Vitamin D, pre-eclampsia, and preterm birth among pregnancies at high risk for pre-eclampsia: an analysis of data from a low-dose aspirin trial.**

Gernand AD<sup>1</sup>, Simhan HN<sup>2</sup>, Baca KM<sup>3</sup>, Caritis S<sup>4</sup>, Bodnar LM<sup>5</sup>.  
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**CONCLUSION:**

Maternal vitamin D status in the second trimester was inversely associated with risk of early-onset pre-eclampsia and preterm birth at <35 weeks in women at high risk for pre-eclampsia.

**TWEETABLE ABSTRACT:**

Vitamin D is inversely related to risk of pre-eclampsia and preterm birth at <35 weeks in high-risk pregnancies.

## 8. VISCERA

### IBS and diet

Neurogastroenterol Motil. 2016 Oct 16. doi: 10.1111/nmo.12969.

#### **Effects of varying dietary content of fermentable short-chain carbohydrates on symptoms, fecal microenvironment, and cytokine profiles in patients with irritable bowel syndrome.**

Hustoft TN<sup>1</sup>, Hausken T<sup>2,3,4</sup>, Ystad SO<sup>2,4</sup>, Valeur J<sup>5</sup>, Brokstad K<sup>6</sup>, Hatlebakk JG<sup>2,3,4</sup>, Lied GA<sup>2,3,4</sup>.  
Author information

#### Abstract

##### **BACKGROUND:**

A diet low in fermentable oligosaccharides, disaccharides, monosaccharides, and polyols (FODMAPs) is increasingly recommended for patients with irritable bowel syndrome (IBS). We aimed to investigate the effects of a blinded low-FODMAP vs high-fructo-oligosaccharides (FOS) diet on symptoms, immune activation, gut microbiota composition, and short-chain fatty acids (SCFAs).

##### **METHODS:**

Twenty patients with diarrhea-predominant or mixed IBS were instructed to follow a low-FODMAP diet (LFD) throughout a 9-week study period. After 3 weeks, they were randomized and double-blindly assigned to receive a supplement of either FOS (FODMAP) or maltodextrin (placebo) for the next 10 days, followed by a 3-week washout period before crossover. Irritable bowel syndrome severity scoring system (IBS-SSS) was used to evaluate symptoms. Cytokines (interleukin [IL]-6, IL-8, and tumor necrosis factor alpha) were analyzed in blood samples, and gut microbiota composition (16S rRNA) and SCFAs were analyzed in fecal samples.

##### **KEY RESULTS:**

Irritable bowel syndrome symptoms consistently improved after 3 weeks of LFD, and significantly more participants reported symptom relief in response to placebo (80%) than FOS (30%). Serum levels of proinflammatory IL-6 and IL-8, as well as levels of fecal bacteria (Actinobacteria, Bifidobacterium, and Faecalibacterium prausnitzii), total SCFAs, and n-butyric acid, decreased significantly on the LFD as compared to baseline. Ten days of FOS supplementation increased the level of these bacteria, whereas levels of cytokines and SCFAs remained unchanged.

##### **CONCLUSIONS AND INFERENCES:**

Our findings support the efficacy of a LFD in alleviating IBS symptoms, and show changes in inflammatory cytokines, microbiota profile, and SCFAs, which may have consequences for gut health.

**Gluten free diet**

Eur J Gastroenterol Hepatol. 2016 Nov;28(11):1298-304. doi: 10.1097/MEG.0000000000000709.

**Symptoms and biomarkers associated with celiac disease: evaluation of a population-based screening program in adults.**

Kårhus LL<sup>1</sup>, Thuesen BH, Rumessen JJ, Linneberg A.  
Author information

Abstract

**OBJECTIVES:**

To identify possible early predictors (symptoms and biomarkers) of celiac disease, compare symptoms before and after screening, and evaluate the diagnostic efficacy of serologic screening for celiac disease in an adult Danish population.

**METHODS:**

This cross-sectional population-based study was based on the 5-year follow-up of the Health2006 cohort, where 2297 individuals were screened for celiac disease; 56 were antibody positive and thus invited to clinical evaluation. Eight were diagnosed with biopsy-verified celiac disease. A follow-up questionnaire was sent to antibody-positive individuals 19 months after the clinical evaluation to obtain information on their symptoms and their experience with participation in the screening.

**RESULTS:**

Before screening, participants subsequently diagnosed with celiac disease did not differ from the rest of the population with respect to symptoms, but had significantly lower total cholesterol. Tissue transglutaminase IgA antibodies with a cut-off of 10 U/ml had a positive predictive value of 88%. The majority of participants were satisfied with their participation in the screening program. Individuals with celiac disease were generally satisfied with having been diagnosed and 71% felt better on a gluten-free diet.

**CONCLUSION:**

There were no differences in the prevalence of symptoms between participants with and without screening-detected celiac disease, confirming that risk stratification in a general population by symptoms is difficult. The majority of participants diagnosed with celiac disease felt better on a gluten-free diet despite not reporting abdominal symptoms before diagnosis and participants in the clinical evaluation were generally satisfied with participation in the screening program

## Gluten free diet

Int J Colorectal Dis. 2016 Sep 30.

**Long-term response to gluten-free diet as evidence for non-celiac wheat sensitivity in one third of patients with diarrhea-dominant and mixed-type irritable bowel syndrome.**

Barmeyer C<sup>1,2</sup>, Schumann M<sup>1</sup>, Meyer T<sup>1</sup>, Zielinski C<sup>3,4</sup>, Zuberbier T<sup>3</sup>, Siegmund B<sup>1</sup>, Schulzke JD<sup>1,2</sup>, Daum S<sup>1</sup>, Ullrich R<sup>5</sup>.

Author information

Abstract

**PURPOSE:**

Irritable bowel syndrome (IBS) is common but therapies are unsatisfactory. Food is often suspected as cause by patients, but diagnostic procedures, apart from allergy testing, are limited. Based on the hypothesis of non-celiac wheat sensitivity (WS) in a subgroup of IBS patients, we tested the long-term response to a gluten-free diet (GFD) and investigated HLA-DQ2 or -DQ8 expression as a diagnostic marker for WS in diarrhea-dominant (IBS-D) and mixed-type IBS (IBS-M).

**METHODS:**

The response to a GFD served as reference test for WS and HLA-DQ2/8 expression was determined as index test. Patients were classified as responders if they reported complete or considerable relief of IBS symptoms on at least 75 % of weeks over a 4-month period of gluten-free diet. Established questionnaires (IBS-Quality of Life (IBS-QoL), IBS Symptom Severity Scale (IBS-SSS), European Quality of Life-5 Dimensions (EQ-5D)) were used for secondary outcome measures.

**RESULTS:**

Thirty-five patients finished the study. Of these, 12 (34 %) were responders and classified as having WS (95 % CI 21-51 %). HLA-DQ2/8 expression had a specificity of 52 % (95 % CI 33-71 %) and sensitivity of 25 % (95 % CI 8-54 %) for WS. Responders showed improvement in quality of life and symptom scores. At 1-year follow-up, all responders and 55 % of non-responders were still on GFD and reported symptom relief.

**CONCLUSION:**

Using strict criteria as recommended for IBS studies, about one third of patients with IBS-D or IBS-M are wheat sensitive, with a similar proportion in both IBS types. Expression of HLA-DQ2/8 is not useful as diagnostic marker for WS. Long-term adherence to a GFD is high and can sustain symptomatic improvement.

**IBS and inflammation factors**

Dig Dis Sci. 2016 Nov;61(11):3270-3277. Epub 2016 Sep 12.

**Impact of Low Immunoglobulin G Levels on Disease Outcomes in Patients with Inflammatory Bowel Diseases.**

Horton N<sup>1</sup>, Wu X<sup>2</sup>, Philpott J<sup>2</sup>, Garber A<sup>2</sup>, Achkar JP<sup>2</sup>, Brzezinski A<sup>2</sup>, Lashner BA<sup>2</sup>, Shen B<sup>3</sup>.  
Author information

Abstract

**BACKGROUND:**

Inflammatory bowel diseases (IBDs) are considered immune-mediated disorders with dysregulated innate and adaptive immunities. Secondary immunoglobulin deficiency can occur in IBD and its impact on the disease course of IBD is not clear.

**AIMS:**

We sought to determine associations between low IgG/G1 levels and poor clinical outcomes in IBD patients.

**METHODS:**

This historic cohort study was performed on IBD patients with obtained IgG/IgG1 levels. The primary outcome was defined as any IBD-related bowel resection surgery and/or hospitalization. Subgroup analyses assessed particular surgical outcomes in Crohn's disease (CD), ulcerative colitis (UC) or indeterminate colitis (IC), and ileal pouch-anal anastomosis (IPAA). The secondary outcomes included IBD drug escalations and *C. difficile* or cytomegalovirus infections.

**RESULTS:**

A total of 136 IBD patients had IgG/G1 levels checked and adequate follow-up, 58 (42.6 %) with normal IgG/G1 levels and 78 (57.4 %) having low levels. A total of 49 patients (62.8 %) with low immunoglobulin levels had IBD-related surgeries or hospitalizations, compared to 33 patients (56.9 %) with normal levels [odds ratio (OR) 1.28, 95 % confidence interval (CI) 0.64-2.56;  $p = 0.49$ ]. Low IgG/G1 levels were associated with IBD-related surgery in CD in univariate analysis [hazard ratio (HR) 4.42, 95 % CI 1.02-19.23;  $p = 0.048$ ] and in Kaplan-Meier survival curve analysis ( $p = 0.03$ ), with a trend toward significance on multivariate analysis (HR 3.07, 95 % CI 0.67-14.31;  $p = 0.15$ ). IBD patients with low IgG/G1 levels required more small bowel resections (12.8 vs. 1.7 %,  $p = 0.024$ ) and 5-aminosalicylate initiations (28.2 vs. 13.8 %,  $p = 0.045$ ).

**CONCLUSIONS:**

Our study demonstrated a possible association between low IgG/G1 levels and poor outcomes in CD including surgery. Future implications include using immunoglobulin levels in IBD patients as a prognostic indicator or boosting humoral immunity as a treatment in this subset.

### Sucrose and ulcerative colitis

Carbohydrate and protein intake and risk of ulcerative colitis: Systematic review and dose-response meta-analysis of epidemiological studies

Clinical Nutrition, 10/18/2016

**W**ang F, et al. – The purpose of this study was to assess the role of carbohydrate and protein intake in the development of ulcerative colitis (UC). The results obtained from this meta-analysis indicate a lack of affiliation between dietary carbohydrate or protein intake and the risk of UC, with the exception of the subtype of sucrose which played a significant role in the development of UC.

#### Methods

- For this study, comprehensive search in PubMed and Embase was conducted to identify all relevant studies, and the role of carbohydrate and protein intake in the development of UC was quantitatively assessed by dose-response meta-analysis.

#### Results

- 9 studies (5 case-control and 4 prospective cohort) were related to an aggregate of 975 UC cases and 239352 controls.
- The summary relative risks (RR) for per 10g increment/day were 1.005 (95% CI: 0.991-1.019,  $I^2=31.5%$ ,  $n=5$ ) for total carbohydrate intake, 1.001 (95% CI: 0.971-1.032,  $I^2=0.0%$ ,  $n=7$ ) for the subtype of fibre intake, 1.029 (95% CI: 0.962-1.101,  $I^2=68.9%$ ,  $n=2$ ) for the subtype of sugar intake, and 1.010 (95% CI: 0.975-1.047,  $I^2=12.4%$ ,  $n=7$ ) for total protein intake.
- Among sugar subtypes, just sucrose intake was discovered positively related with UC risk (RR for per 10g increment/day: 1.098, 95% CI: 1.024-1.177,  $I^2=0.0%$ ,  $n=3$ ).
- According to the outcomes of this work, no evidence of a non-linear dose-response affiliation was found between the nutrient intake and UC risk, except for the subtype of sucrose ( $P$  for non-linear trend =0.032).
- Findings revealed that subgroup analyses indicated consistent results.

**Vegetarian diet and Cancer**

J Hum Nutr Diet. 2016 Oct 6. doi: 10.1111/jhn.12426.

**Vegetarianism and breast, colorectal and prostate cancer risk: an overview and meta-analysis of cohort studies.**

Godos J<sup>1</sup>, Bella F<sup>1</sup>, Sciacca S<sup>1</sup>, Galvano F<sup>2</sup>, Grosso G<sup>3</sup>.

Author information

Abstract

**BACKGROUND:**

Vegetarian diets may be associated with certain benefits toward human health, although current evidence is scarce and contrasting. In the present study, a systematic review and meta-analysis of prospective cohort studies was performed with respect to the association between vegetarian diets and breast, colorectal and prostate cancer risk.

**METHODS:**

Studies were systematically searched in Pubmed and EMBASE electronic databases. Eligible studies had a prospective design and compared vegetarian, semi- and pesco-vegetarian diets with a non-vegetarian diet. Random-effects models were applied to calculate relative risks (RRs) of cancer between diets. Statistical heterogeneity and publication bias were explored.

**RESULTS:**

A total of nine studies were included in the meta-analysis. Studies were conducted on six cohorts accounting for 686 629 individuals, and 3441, 4062 and 1935 cases of breast, colorectal and prostate cancer, respectively. None of the analyses showed a significant association of vegetarian diet and a lower risk of either breast, colorectal, and prostate cancer compared to a non-vegetarian diet. By contrast, a lower risk of colorectal cancer was associated with a semi-vegetarian diet (RR = 0.86, 95% confidence interval = 0.79-0.94;  $I^2 = 0\%$ ,  $P_{\text{heterogeneity}} = 0.82$ ) and a pesco-vegetarian diet (RR = 0.67, 95% confidence interval = 0.53, 0.83;  $I^2 = 0\%$ ,  $P_{\text{heterogeneity}} = 0.46$ ) compared to a non-vegetarian diet. The subgroup analysis by cancer localisation showed no differences in summary risk estimates between colon and rectal cancer.

**CONCLUSIONS:**

A summary of the existing evidence from cohort studies on vegetarian diets showed that complete exclusion of any source of protein from the diet is not associated with further benefits for human health.

## 10 A. CERVICAL SPINE

### Reliability of cervical relocation test

#### **The reliability of the cervical relocation test on people with and without a history of neck pain**

Sarah Burke, Kristina Lynch, Zakkee Moghul, Craig Young, Kristen Saviola & **Ron Schenk**

**Background:** Physical therapy intervention is often sought to treat cervical spine conditions and a comprehensive physical therapy examination has been associated with more favourable outcomes. The cervical relocation test (CRT) is one method used to assess joint position sense (PS) integrity of the cervical spine. Previous research has found significant differences in the CRT between symptomatic and asymptomatic subjects. Impaired kinaesthetic awareness in the cervical spine may be associated with degenerative joint disease, chronicity of the complaint and increased susceptibility to re-injury.

**Purpose:** The purpose of this study was to determine the intertester and intratester reliability of cervical relocation using the cervical range of motion instrument (CROM) and an affixed laser (AL) device among subjects with and without a history of neck pain. In addition, it was hypothesised that those individuals with a history of neck pain would have greater difficulty on the CRT.

**Methods:** A total of 50 asymptomatic subjects ( $n = 50$ ) were assigned to two researchers. The CRT was performed for each tester by the subject rotating the cervical spine for three trials to the right and left for the CROM and AL.

**Results:** The results indicate a significant intertester reliability of the CROM (interclass correlation coefficient (ICC) = 0.717[0.502–0.839]; 0.773[0.595–0.873]) for the subjects in this sample.

**Conclusion:** This study demonstrated that the CROM is a reliable device for measuring cervical relocation between different testers. Future research should investigate if the CRT is predictive of prognosis in patients with cervical pathology.

Keywords: Cervical relocation test, CROM, Laser,

### Neck pain and respiration

Am J Phys Med Rehabil. 2016 Sep 8.

The Association Between Neck Pain and Pulmonary Function: A Systematic Review.

Kahlaee AH<sup>1</sup>, Ghamkhar L, Arab AM.  
Author information

#### Abstract

The aim of this study was to systematically review the evidence on respiratory function changes in patients with chronic neck pain. MEDLINE, Elsevier, ProQuest, PubMed, Scopus, Springer, and Google scholar electronic databases were explored thorough December 2015. English-language studies investigating cervical musculoskeletal and respiratory parameters in patients with chronic neck pain were included. Characteristics of the patients, sampling method and size, musculoskeletal and respiratory parameters studied, and appropriateness of the statistical tests were considered. Studies were rated based on study design and performance. Of the 68 studies reviewed, 9 observational studies met our inclusion criteria. Significant difference in maximum inspiratory and expiratory pressures were reported in patients with chronic neck pain compared to asymptomatic subjects. Some of the respiratory volumes were found to be lower in patients with chronic neck pain. Muscle strength and endurance, cervical range of motion, and psychological states were found to be significantly correlated with respiratory parameters. Lower Pco<sub>2</sub> in patients and significant relationship between chest expansion and neck pain were also shown. Respiratory retraining was found to be effective in improving some cervical musculoskeletal and respiratory impairment. Functional pulmonary impairments accompany chronic neck pain. Based on the observed association, investigation of the effectiveness of management of CNP on respiratory function is strongly suggested.

**10 B. CERVICAL EXERCISES****Specific vs. general ex**

J Rehabil Med. 2016 Oct 5;48(8):696-704. doi: 10.2340/16501977-2120.

**Short- and long-term effects of exercise on neck muscle function in cervical radiculopathy: A randomized clinical trial.**

Halvorsen M<sup>1</sup>, Falla D, Gizzi L, Harms-Ringdahl K, Peolsson A, Dederig Å.  
Author information

**Abstract****OBJECTIVE:**

To compare short- and long-term changes in neck muscle endurance, electromyography measures of neck muscle activation and fatigue and ratings of fatigue and pain after neck-specific training or physical activity in people with cervical radiculopathy.

**DESIGN:**

Randomized clinical trial.

**SUBJECTS/PATIENTS:**

Seventy-five patients with cervical radiculopathy.

**METHODS:**

Patients underwent neck-specific training in combination with a cognitive behavioural approach or prescribed physical activity over a period of 14 weeks. Immediately after the intervention and 12 months later, surface electromyography was recorded from neck flexor and extensor muscles during neck endurance tests. Time to task failure, amplitude and median frequency of the electromyography signal, and subjective fatigue and pain ratings were analysed in 50 patients who completed at least one follow-up.

**RESULTS:**

A significant increase in neck flexor endurance time was observed for both groups at 14 weeks compared with baseline and this was maintained at the 12-month follow-up ( $p < 0.005$ ). No change was identified for the slope of the median frequency. For the neck-specific training group, splenius capitis was less active during neck flexion at both follow-ups ( $p < 0.01$ ), indicating reduced muscle co-activation.

**CONCLUSION:**

Both specific and general exercise increased neck flexor endurance, but neck-specific training only reduced co-activation of antagonist muscles during sustained neck flexion.

**12 B. CERVICAL SURGERIES****Tobacco impact results of surgery**

Spine (Phila Pa 1976). 2016 Mar 31.

**Does Tobacco Use Attenuate Benefits of Early Decompression in Patients with Cervical Myelopathy?**

Kusin DJ<sup>1</sup>, Li SQ, Ahn UM, Ahn NU.

Author information

Abstract

**STUDY DESIGN:**

Retrospective Cohort OBJECTIVE.: This study investigates the interplay between duration of preoperative symptoms and smoking status with respect to postoperative outcomes in patients with cervical spondylotic myelopathy (CSM).

**SUMMARY OF BACKGROUND DATA:**

Many studies have established the harms of smoking and several have identified the benefits of early decompression in patients with cervical myelopathy, but to our knowledge none have assessed the relationship between these two variables.

**METHODS:**

The medical records of all 212 patients operated on by the senior author between March 2005 and July 2012 were reviewed. Inclusion criteria were the diagnosis of CSM with a Nurick score, surgical intervention, and at least 2 years of follow up. Patients were categorized according to smoking status and quantification of tobacco use by packs per day and pack years, and duration of symptoms according to thresholds of 6, 12, or 24 months. Age, sex, preoperative Nurick score, duration of preoperative symptoms, duration of follow up, procedure performed, prior surgery, number of levels operated on, diabetes status, ethanol use, and signal change on preoperative MRI were also recorded for ordered logistical regression analysis.

**RESULTS:**

125 patients met all criteria. 80 patients were smokers and 45 were nonsmokers. The median change in Nurick score for nonsmokers was 2 compared to 1 in smokers. Nonsmokers had a statistically significant likelihood of decreased change in Nurick score for symptom duration of greater than 24 months (OR=0.06, p=0.0025). Smokers did not show a significant difference in the change in Nurick score for any threshold of symptom duration.

**CONCLUSIONS:**

Increased duration of symptoms significantly affects outcomes in surgical decompression of CSM. A history of cigarette use may attenuate the benefit of early decompression and results in lower improvement in Nurick score regardless of symptom duration.

### 13. CRANIUM/TMJ

#### Manual therapy and TMJ

J Man Manip Ther. 2016 May;24(2):90-7. doi: 10.1179/2042618614Y.0000000080.

#### **Cervicothoracic junction thrust manipulation in the multimodal management of a patient with temporomandibular disorder.**

Jayaseelan DJ<sup>1</sup>, Tow NS<sup>2</sup>.

Author information

#### Abstract

Temporomandibular disorder (TMD) is a common condition that can be difficult to manage in physical therapy. A number of interventions, such as manual therapy, therapeutic exercise, and patient education have typically been used in some combination. However, the evidence regarding thrust manipulation of not only the local but also adjacent segments is sparse. Specifically, the use of cervicothoracic (CT) junction thrust manipulation has not previously been described in the management of individuals with TMD. In this case report, CT junction thrust manipulation, in addition to locally directed manual therapy, exercise, and postural education, was associated with immediate improvements in neck and jaw symptoms and function in a complex patient with TMD. The patient was seen for seven visits over the course of 2 months and demonstrated clinically significant changes in the neck disability index (NDI), the numeric rating of pain scale (NPRS), and the global rating of change (GROC) scale. The purpose of this report is to describe the successful physical therapy management of a patient with TMD utilizing manual therapy, including CT junction thrust manipulation, education, and exercise.

**Dry needling and TMJ**

Acupunct Med. 2016 Oct 3. pii: acupmed-2016-011102. doi: 10.1136/acupmed-2016-011102.

**Effects of myofascial trigger point dry needling in patients with sleep bruxism and temporomandibular disorders: a prospective case series.**

Blasco-Bonora PM<sup>1</sup>, Martín-Pintado-Zugasti A<sup>2</sup>.  
Author information

## Abstract

**OBJECTIVES:**

To investigate the effects of deep dry needling (DN) of myofascial trigger points (MTrPs) of the masseter and temporalis on pain, pressure pain threshold (PPT), pain-free maximal jaw opening and temporomandibular disorder (TMD)-related disability in patients with sleep bruxism (SB) and myofascial TMD.

**METHODS:**

Seventeen subjects (11 women, 6 men) aged 39±13 years (range 23-66) diagnosed with SB and myofascial TMD were invited to participate in this prospective case series study. Each subject received a deep DN intervention in the masseter and temporalis MTrPs. Pain intensity, PPT, pain-free maximal jaw opening and TMD-related disability were assessed before treatment, immediately after treatment and at 1-week follow-up. Jaw disability was assessed using the jaw disability checklist (JDC) at baseline and 1 week post-treatment only.

**RESULTS:**

One-way analyses of variance showed significant improvements in pain intensity, PPT and jaw opening ( $p < 0.001$ ). Post-hoc analysis revealed significant differences between baseline and post-intervention follow-up time points in pain (immediate: Cohen's  $d = 1.72$ ,  $p < 0.001$ ; 1 week:  $d = 3.24$ ,  $p < 0.001$ ), jaw opening (immediate:  $d = 0.77$ ,  $p < 0.001$ ; 1 week:  $d = 1.02$ ,  $p < 0.001$ ) and PPT in the masseter (immediate:  $d = 1.02$ ,  $p < 0.001$ ; 1 week:  $d = 1.64$ ,  $p < 0.001$ ) and temporalis (immediate:  $d = 0.91$ ,  $p = 0.006$ ; 1 week:  $d = 1.8$ ,  $p < 0.001$ ). A dependent t-test showed a significant improvement in jaw functioning, reflected by a large reduction in 1-week JDC scores relative to baseline ( $d = 3.15$ ,  $p < 0.001$ ).

**CONCLUSIONS:**

Deep DN of active MTrPs in the masseter and temporalis in patients with myofascial TMD and SB was associated with immediate and 1-week improvements in pain, sensitivity, jaw opening and TMD-related disability.

**TRIAL REGISTRATION NUMBER:**

NCT02587182; Results.

**TMJ exercise**

Clin Rehabil. 2016 Oct 3. pii: 0269215516672275.

**The effectiveness of exercise therapy for temporomandibular dysfunction: A systematic review and meta-analysis.**

Dickerson SM<sup>1</sup>, Weaver JM<sup>1</sup>, Boyson AN<sup>1</sup>, Thacker JA<sup>1</sup>, Junak AA<sup>1</sup>, Ritzline PD<sup>1</sup>, Donaldson MB<sup>2</sup>.

Author information

Abstract

**OBJECTIVE:**

To investigate the effectiveness of exercise therapy on pain, function, and mobility outcomes in patients with temporomandibular joint dysfunction.

**STUDY DESIGN:**

Systematic review with meta-analysis.

**METHODS:**

A systematic review and meta-analysis undertaken following Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Studies that met the inclusion criteria: (1) randomized controlled trials; (2) a population with the diagnosis of temporomandibular joint dysfunction; and (3) interventions that included exercise therapy were considered for review. When studies demonstrated homogeneity on outcome measures, the mean differences or standardized mean differences with 95% confidence interval were calculated and pooled in a meta-analysis for pooled synthesis.

**RESULTS:**

Six articles with a total of 419 participants were included in the review and only four studies were included in the meta-analysis. Mobility and mixed exercise therapy approaches appear to be the most common exercise approaches utilized for management of temporomandibular joint dysfunction. Exercise therapy and the associated dosage provide moderate short-term and varying long-term benefits in reduction of pain and improvement of range of motion of the in patients with temporomandibular joint dysfunction.

**CONCLUSION:**

Included studies suggest a mobility or a mixed approach to exercise therapies have impact on reducing pain, significant impact for increasing range of motion, but lack a significant impact for functional improvement.

## TMJ Disc

Int J Oral Maxillofac Surg. 2016 Sep 13. pii: S0901-5027(16)30187-4. doi: 10.1016/j.ijom.2016.08.011.

**Influence of temporomandibular joint disc displacement on mandibular advancement in patients without pre-treatment condylar resorption.**

Miao Z<sup>1</sup>, Wang XD<sup>2</sup>, Mao LX<sup>3</sup>, Xia YH<sup>3</sup>, Yuan LJ<sup>3</sup>, Cai M<sup>2</sup>, Liu JQ<sup>3</sup>, Wang B<sup>3</sup>, Yang X<sup>3</sup>, Zhu L<sup>4</sup>, Yu HB<sup>2</sup>, Fang B<sup>5</sup>.

Author information

## Abstract

The purpose of this study was to clarify the correlation between pre-treatment anterior disc displacement and mandibular stability after orthognathic and orthodontic treatment among patients with a skeletal class II malocclusion and without pre-treatment condylar resorption.

Thirty-seven patients were included (7 male, 30 female). The mean length of follow-up was  $6.76 \pm 3.06$  years. Patients with condylar resorption before treatment were excluded. Magnetic resonance images and lateral cephalometric radiographs were taken before treatment (T0), after treatment (T1), and at follow-up (T2). Patients were classified according to the degree of disc displacement:  $-10$ - $10^\circ$  'normal',  $11$ - $50^\circ$  'slight to mild',  $\geq 51^\circ$  'moderate to severe'. Results showed the condyle moved posterosuperiorly after treatment, and then moved anteriorly to a more concentric location during the long follow-up period. Condylar movement was found not to correlate with disc displacement. The degree of disc displacement before treatment did not correlate with the post-surgical mandibular positional change in either the sagittal or vertical direction.

To conclude, the mandibular bilateral sagittal split ramus osteotomy was stable in the long-term after orthognathic and orthodontic treatment. In the absence of pre-treatment condylar resorption, the degree of initial anterior disc displacement did not have a significant influence on the stability of mandibular advancement.

## 14. HEADACHES

### Diet

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

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

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

Author information

#### Abstract

Dietary triggers are commonly reported by patients with a variety of headaches, particularly those with migraines. The presence of any specific dietary trigger in migraine patients varies from 10 to 64 % depending on study population and methodology. Some foods trigger headache within an hour while others develop within 12 h post ingestion. Alcohol (especially red wine and beer), chocolate, caffeine, dairy products such as aged cheese, food preservatives with nitrates and nitrites, monosodium glutamate (MSG), and artificial sweeteners such as aspartame have all been studied as migraine triggers in the past. This review focuses the evidence linking these compounds to headache and examines the prevalence of these triggers from prior population-based studies.

Recent literature surrounding headache related to fasting and weight loss as well as elimination diets based on serum food antibody testing will also be summarized to help physicians recommend low-risk, non-pharmacological adjunctive therapies for patients with debilitating headaches.

**19. GLENOHUMERAL/SHOULDER****Central pain mechanisms**

Pain Pract. 2016 Oct 14. doi: 10.1111/papr.12502.

**Central Pain Processing in Patients with Shoulder Pain: A Review of the Literature.**

Noten S<sup>1,2</sup>, Struyf F<sup>1</sup>, Lluch E<sup>2,3</sup>, D'Hoore M<sup>1</sup>, Van Looveren E<sup>1</sup>, Meeus M<sup>4,5,6</sup>.

Author information

Abstract

**BACKGROUND:**

Shoulder pain is a common health problem in which changes in shoulder structure cannot always explain the patient's perceived pain. Central sensitization (CS) might play a role in a subgroup of these patients.

**METHODS:**

The literature was systematically reviewed to address the role of CS in patients with shoulder pain. Electronic databases PubMed and Web of Knowledge were searched for relevant studies.

**RESULTS:**

Eighteen full-text articles were included, methodological quality was scored, and information was extracted. Studies were clustered on those studying patients with musculoskeletal (MSK) shoulder pain and those studying patients with hemiplegic shoulder pain (HSP). In particular, quantitative sensory testing revealed hyperalgesia for pressure pain in the MSK group, whereas these results were inconsistent in patients with HSP. Conditioned pain modulation was reduced in patients with MSK shoulder pain, but functioned normally in the HSP group.

**CONCLUSION:**

This review has shown that great progress has been made toward a better understanding of neurophysiologic pain mechanisms in patients with shoulder pain. The presence of generalized mechanical hyperalgesia, allodynia, and impaired conditioned pain modulation in patients with MSK shoulder pain indicates the involvement of the central nervous system. Widespread somatosensory abnormalities observed in patients with HSP could suggest a central origin for their shoulder pain and predispose patients with HSP to develop CS, although results are inconsistent. Additional research is required adopting different assessment methods (especially dynamic methods) to establish the role of CS in patients with shoulder pain.

**22 A. IMPINGEMENT****Kinesio tape**

Physiother Theory Pract. 2016 Oct;32(7):501-8. doi: 10.1080/09593985.2016.1219434. Epub 2016 Sep 12.

**Kinesio taping or just taping in shoulder subacromial impingement syndrome? A randomized, double-blind, placebo-controlled trial.**

Kocyyigit F<sup>1</sup>, Acar M<sup>2</sup>, Turkmen MB<sup>3</sup>, Kose T<sup>4</sup>, Guldane N<sup>4</sup>, Kuyucu E<sup>5</sup>.  
Author information

Abstract

**OBJECTIVE:**

To verify effects of kinesio taping (KT) in shoulder subacromial impingement syndrome (SIS) when compared to sham taping applied in the same way with KT.

**PATIENTS AND METHODS:**

Patients were randomized as group 1 (n = 21) KT group and group 2 (n = 20) sham-taping group. Taping was applied every three days, three times during the study period. We assessed all the patients at baseline, at the end of the taping period (12th day), and at one-month post-intervention. We assessed pain on the 100 mm visual analog scale (VAS). Shoulder range of motion (ROM), Constant Scores, and Nottingham Health Profile (NHP) scores were evaluated.

**RESULTS:**

Of the 41 participants, 13 were males (32%) and 28 were females (68%). The mean age was 45 ± 15 years (range 20-65 years). We documented a significant decrease in VAS for nocturnal pain, and Constant Score in both groups. The KT group showed additional significant change in NHP pain and physical activity scores.

**CONCLUSION:**

KT and sham taping generated similar results regarding pain and Constant Scores.

**26. CARPAL TUNNEL SYNDROME****Median nerve mobility**

J Hand Ther. 2016 Sep 28. pii: S0894-1130(16)30131-4. doi: 10.1016/j.jht.2016.09.002.

**Is there a relationship between impaired median nerve excursion and carpal tunnel syndrome? A systematic review.**

Ellis R<sup>1</sup>, Blyth R<sup>2</sup>, Arnold N<sup>2</sup>, Miner-Williams PhD W<sup>3</sup>.

Author information

Abstract

**STUDY DESIGN:**

Systematic review.

**INTRODUCTION:**

It is accepted that the etiology of carpal tunnel syndrome (CTS) is multifactorial. One of the most commonly accepted etiologic factors for CTS is compromise of the kinematic behavior and excursion of the median nerve.

**PURPOSE OF THE STUDY:**

The objective of this systematic review was to establish if there is a relationship between impaired median nerve excursion and CTS.

**METHODS:**

A systematic review, following the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines, was conducted. Studies were sought where in vivo median nerve excursion was compared between people with CTS to an appropriate control group. Quality appraisal for each study was conducted using the Newcastle-Ottawa Scale by 2 independent evaluators.

**RESULTS:**

Ten case-control studies using ultrasound imaging to quantify median nerve excursion were included. All studies were rated as of "moderate" methodologic quality having scored 6 or 7 (of 9 stars) for the Newcastle-Ottawa Scale. Seven of the 10 studies concluded that median nerve excursion was reduced in a CTS population when compared with controls.

**CONCLUSION:**

The literature suggests that median nerve excursion is reduced in people with CTS when compared with healthy controls.

LEVEL OF EVIDENCE:3a.

**30 A. IMPINGEMENT****Consensus of diagnosis**

Br J Sports Med. 2016 Oct;50(19):1169-76. doi: 10.1136/bjsports-2016-096743.

**The Warwick Agreement on femoroacetabular impingement syndrome (FAI syndrome): an international consensus statement.**

Griffin DR<sup>1</sup>, Dickenson EJ<sup>1</sup>, O'Donnell J<sup>2</sup>, Agricola R<sup>3</sup>, Awan T<sup>4</sup>, Beck M<sup>5</sup>, Clohisy JC<sup>6</sup>, Dijkstra HP<sup>7</sup>, Falvey E<sup>8</sup>, Gimpel M<sup>9</sup>, Hinman RS<sup>10</sup>, Hölmich P<sup>11</sup>, Kassarian A<sup>12</sup>, Martin HD<sup>13</sup>, Martin R<sup>14</sup>, Mather RC<sup>15</sup>, Philippon MJ<sup>16</sup>, Reiman MP<sup>15</sup>, Takla A<sup>17</sup>, Thorborg K<sup>18</sup>, Walker S<sup>19</sup>, Weir A<sup>20</sup>, Bennell KL<sup>21</sup>.

Author information

Abstract

The 2016 Warwick Agreement on femoroacetabular impingement (FAI) syndrome was convened to build an international, multidisciplinary consensus on the diagnosis and management of patients with FAI syndrome. 22 panel members and 1 patient from 9 countries and 5 different specialties participated in a 1-day consensus meeting on 29 June 2016. Prior to the meeting, 6 questions were agreed on, and recent relevant systematic reviews and seminal literature were circulated. Panel members gave presentations on the topics of the agreed questions at Sports Hip 2016, an open meeting held in the UK on 27-29 June. Presentations were followed by open discussion. At the 1-day consensus meeting, panel members developed statements in response to each question through open discussion; members then scored their level of agreement with each response on a scale of 0-10. Substantial agreement (range 9.5-10) was reached for each of the 6 consensus questions, and the associated terminology was agreed on. The term 'femoroacetabular impingement syndrome' was introduced to reflect the central role of patients' symptoms in the disorder. To reach a diagnosis, patients should have appropriate symptoms, positive clinical signs and imaging findings. Suitable treatments are conservative care, rehabilitation, and arthroscopic or open surgery. Current understanding of prognosis and topics for future research were discussed. The 2016 Warwick Agreement on FAI syndrome is an international multidisciplinary agreement on the diagnosis, treatment principles and key terminology relating to FAI syndrome. Author note The Warwick Agreement on femoroacetabular impingement syndrome has been endorsed by the following 25 clinical societies: American Medical Society for Sports Medicine (AMSSM), Association of Chartered Physiotherapists in Sports and Exercise Medicine (ACPSEM), Australasian College of Sports and Exercise Physicians (ACSEP), Austian Sports Physiotherapists, British Association of Sports and Exercise Medicine (BASEM), British Association of Sport Rehabilitators and Trainers (BASRaT), Canadian Academy of Sport and Exercise Medicine (CASEM), Danish Society of Sports Physical Therapy (DSSF), European College of Sports and Exercise Physicians (ECOSEP), European Society of Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA), Finnish Sports Physiotherapist Association (SUFT), German-Austrian-Swiss Society for Orthopaedic Traumatologic Sports Medicine (GOTS), International Federation of Sports Physical Therapy (IFSPT), International Society for Hip Arthroscopy (ISHA), Gruppo di Interesse Specialistico dell'A.I.F.I., Norwegian Association of Sports Medicine and Physical Activity (NIMF), Norwegian Sports Physiotherapy Association (FFI), Society of Sports Therapists (SST), South African Sports Medicine Association (SASMA), Sports Medicine Australia (SMA), Sports Doctors Australia (SDrA), Sports Physiotherapy New

Zealand (SPNZ), Swedish Society of Exercise and Sports Medicine (SFAIM), Swiss Society of Sports Medicine (SGMS/SGSM), Swiss Sports Physiotherapy Association (SSPA)

## 32 A. KNEE/ACL

### Muscle activation after reconstruction

#### Comparison of Muscle Activation Levels Between Healthy Individuals and Persons Who Have Undergone Anterior Cruciate Ligament Reconstruction During Different Phases of Weight-Bearing Exercises

Authors: Gulcan Harput, PT, PhD<sup>1</sup>, Jennifer Sebert Howard, ATC, PhD<sup>2</sup>, Carl Mattacola, ATC, PhD<sup>3</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2016 **Volume:**0 **Issue:**0 **Pages:**1–29 **DOI:**10.2519/jospt.2016.5896

#### Study Design

Cross-sectional, controlled laboratory study.

#### Background

Quantification of muscular activation during different phases of functional activities is important to understand activation deficits in individuals who have undergone anterior cruciate ligament reconstruction (ACLR).

#### Objectives

To compare activation levels of vastus medialis (VM), medial hamstrings (MH) and gluteus medius (GMed) muscles during the different phases of weight bearing tasks between individuals who had undergone ACLR and healthy controls.

#### Methods

Surface electromyography was used to measure the activation levels of VM, MH and GMed muscles in 16 participants who had undergone ACLR (average time since surgery: 4 yrs) and 15 healthy participants during the reach and return phases of the star excursion balance test (SEBT) and the ascending and descending phases of a step down task (SDT). Repeated measures ANOVAs were performed to determine whether muscle activation levels differed between groups during different phases of the tasks.

#### Results

There were significant group by phase interactions for the GMed during both SEBT and the SDT. GMed activation was lower for the ACLR group during the return phase of the posteromedial direction of the SEBT compared to the control group ( $P = .03$ ). During the SDT, GMed activation was higher for the ACLR group during the ascending phase than descending phase ( $P < .001$ ), while the control group showed no difference between phases ( $P = .707$ ).

#### Conclusion

Individuals who have undergone ACLR have similar VM and MH activation compared to healthy individuals during different phases of the SDT and SEBT. However, phase differences for GMed activity and decreased GMed activity relative to healthy individuals were observed among ACLR participants. *J Orthop Sports Phys Ther*, Epub 12 Oct 2016. doi:10.2519/jospt.2016.5896

### 33. MENISCUS

#### Arthroscopy comparisons

#### A Comparison of the Outcomes for Cartilage Defects of the Knee Treated With Biologic Resurfacing Versus Focal Metallic Implants

Cecilia Pascual-Garrido, M.D., Erika Daley, M.D., Nikhil N. Verma, M.D., Brian J. Cole, M.D., M.B.A.

**Purpose:** To compare the results of focal metallic resurfacing with biologic procedures in patients more than 35 years of age with isolated, full thickness defects of the femoral condyle.

**Methods:** A total of 61 patients met the selection criteria resulting in 30 patients treated with biological procedures, including debridement, microfracture, osteochondral autograft transplantation, osteochondral allograft, and autologous chondrocyte implantation (BIO group), and 32 patients treated with focal metallic resurfacing (CAP group). The BIO and CAP groups were matched according to treatment location, defect grade and size, and age profile. Outcomes included Western Ontario and McMaster Osteoarthritis Index (WOMAC), Short Form-12, and satisfaction. The primary combination endpoint was determined as a 20% improvement (minimum clinically important difference-20) on WOMAC pain and function at 2 years and no additional index lesion-related surgical intervention. Safety and effectiveness were also reported.

**Results:** Thirty patients in the BIO group (mean age of 44.6, range 35-64) had an average follow-up of 2.6 years and 32 patients in the CAP group (mean age 47.9, range 37-68) were followed for 2.0 years. Fifty-three percent in the BIO group and 75% in the CAP group achieved success per the endpoint definition. The mean total WOMAC score improved significantly for both groups (BIO: 57-78;  $P < .001$ ) (CAP: 41-86;  $P < .001$ ). The physical component score (Short Form-12 PCS) improved significantly in the CAP group only (30-36.4;  $P < .001$ ). Good to excellent patient satisfaction was achieved by 80% in BIO and 91% in CAP. There were 4 secondary procedures on the index lesion in the BIO group and 2 in the CAP group.

**Conclusions:** Careful patient selection can achieve high satisfaction rates with both biological and focal metal resurfacing procedures for the treatment of isolated focal chondral lesions of the femoral condyle in the knee. Focal metallic resurfacing results in similar clinical outcomes and provides excellent success rates at short-term follow-up.

**Level of Evidence:** Level III comparative study.

### 34. PATELLA

#### McConnell tapping

J Electromyogr Kinesiol. 2016 Sep 21;31:72-80. doi: 10.1016/j.jelekin.2016.09.006.

#### **McConnell's patellar taping does not alter knee and hip muscle activation differences during proprioceptive exercises: A randomized placebo-controlled trial in women with patellofemoral pain syndrome.**

Araújo CG<sup>1</sup>, de Souza Guerino Macedo C<sup>2</sup>, Ferreira D<sup>2</sup>, Shigaki L<sup>1</sup>, da Silva RA<sup>3</sup>.

Author information

#### Abstract

The purpose of this study was to assess the effect of patellar taping on muscle activation of the knee and hip muscles in women with Patellofemoral Pain Syndrome during five proprioceptive exercises. Forty sedentary women with syndrome were randomly allocated in two groups: Patellar Taping (based in McConnell) and Placebo (vertical taping on patella without any stretching of lateral structures of the knee). Volunteers performed five proprioceptive exercises randomly: Swing apparatus, Mini-trampoline, Bosu balance ball, Anteroposterior sway on a rectangular board and Mediolateral sway on a rectangular board. All exercises were performed in one-leg stance position with injured knee at flexion of 30° during 15s. Muscle activation was measured by surface electromyography across Vastus Medialis, Vastus Lateralis and Gluteus medius muscles. Maximal voluntary contraction was performed for both hip and knee muscles in order to normalize electromyography signal relative to maximum effort during the exercises. ANOVA results reported no significant interaction ( $P>0.05$ ) and no significant differences ( $P>0.05$ ) between groups and intervention effects in all exercise conditions. Significant differences ( $P<0.01$ ) were only reported between muscles, where hip presented higher activity than knee muscles.

Patellar taping is not better than placebo for changes in the muscular activity of both hip and knee muscles during proprioceptive exercises.

#### **TRIAL REGISTRATION NUMBER:**

ClinicalTrials.gov [NCT02322515](https://clinicaltrials.gov/ct2/show/study/NCT02322515).

### 37. OSTEOARTHRITIS/KNEE

#### Tapping helps

Clin Biomech (Bristol, Avon). 2016 Sep 13;39:38-43. doi: 10.1016/j.clinbiomech.2016.09.003.

#### **Biomechanical, neuromuscular and knee pain effects following therapeutic knee taping among patients with knee osteoarthritis during walking gait.**

Edmonds DW<sup>1</sup>, McConnell J<sup>2</sup>, Ebert JR<sup>1</sup>, Ackland TR<sup>1</sup>, Donnelly CJ<sup>3</sup>.

Author information

Abstract

#### **BACKGROUND:**

Knee osteoarthritis is one of the most debilitating diseases associated with aging, and is estimated to affect 9% of men and 18% of women over 65 years of age. Knee osteoarthritis affects the condylar surfaces of the joint and if left untreated generally leads to the slow and painful degeneration of the joint and surrounding structures. With few non-invasive treatment options for osteoarthritis patients, this study investigated the effect of therapeutic taping on knee pain in combination with spatiotemporal, kinematic, kinetic and muscle activation measures.

#### **METHODS:**

Fifteen participants (10 male, 5 female) with radiographic diagnosed knee osteoarthritis attended a single testing session and walked along at a self-selected pace under three different conditions (no tape, sham tape, therapeutic tape). The conditions were randomised within each testing session. Knee pain, lower limb biomechanics and muscle activation were analysed using a one-way repeated measures ANOVA to determine if any differences existed between the three taping conditions ( $\alpha=0.05$ ).

#### **FINDINGS:**

Therapeutic knee taping was shown to significantly reduce the self-reported levels of knee joint pain during straight line walking. No significant differences in spatiotemporal, knee kinetic, knee kinematic or lower limb muscle activation variables were observed between the taping conditions.

#### **INTERPRETATION:**

There is evidence supporting the use of therapeutic knee taping for the management of osteoarthritis related knee pain. Future research is recommended to better understand the complex acute neuro-musculoskeletal adaptations that explain these positive knee pain findings.

**45 A. MANUAL THERAPY LUMBAR & GENERAL****Pain science and MT**

Physiother Theory Pract. 2016 Jul;32(5):408-14. doi: 10.1080/09593985.2016.1194663. Epub 2016 Jun 30.

**Combining manual therapy with pain neuroscience education in the treatment of chronic low back pain: A narrative review of the literature.**

Puentedura EJ<sup>1</sup>, Flynn T<sup>2</sup>.

Author information

**Abstract**

Teaching people with chronic low back pain (CLBP) about the neurobiology and neurophysiology of their pain is referred to as pain neuroscience education (PNE). There is growing evidence that when PNE is provided to patients with chronic musculoskeletal pain, it can result in decreased pain, pain catastrophization, disability, and improved physical performance. Because the aim of PNE is to shift the patient's focus from the tissues in the low back as the source of their pain to the brain's interpretation of inputs, many clinicians could mistakenly believe that PNE should be a "hands-off," education-only approach. An argument can be made that by providing manual therapy or exercise to address local tissue pathology, the patient's focus could be brought back to the low back tissues as the source of their problem. In this narrative literature review, we present the case for a balanced approach that combines PNE with manual therapy and exercise by considering how manual therapy can also be incorporated for interventions with patients with CLBP. We propose that as well as producing local mechanical effects, providing manual therapy within a PNE context can be seen as meeting or perhaps enhancing patient expectations, and also refreshing or sharpening body schema maps within the brain. Ideally, all of this should lead to better outcomes in patients with CLBP

**Myofascial release and LBP**

Spine (Phila Pa 1976). 2016 Sep 9.

**Effects of Myofascial Release in Non-specific Chronic Low Back Pain: A Randomized Clinical Trial.**

Arguisuelas MD<sup>1</sup>, Lisón JF, Sánchez-Zuriaga D, Martínez-Hurtado I, Doménech-Fernández J.  
Author information

Abstract

**STUDY DESIGN:**

Double-blind, randomized parallel sham-controlled trial with concealed allocation and intention-to-treat analysis.

**OBJECTIVE:**

To investigate the effects of an isolate Myofascial Release protocol (MFR) on pain, disability and fear-avoidance beliefs in patients with chronic low back pain (CLBP).

**SUMMARY OF BACKGROUND DATA:**

MFR is a form of manual medicine widely used by physiotherapists in the management of different musculoskeletal pathologies. Up to this moment, no previous studies have reported the effects of an isolated MFR treatment in patients with CLBP.

**METHODS:**

Fifty four participants, with nonspecific CLBP, were randomized to MFR group (n=27) receiving four sessions of myofascial treatment, each lasting 40 minutes, and to control group (n=27) receiving a sham MFR. Variables studied were pain measured by means Short Form McGill Pain questionnaire (SF-MPQ) and visual analogue scale (VAS), disability measured with Roland Morris questionnaire and Fear-Avoidance Beliefs measured with FAB questionnaire (FABQ).

**RESULTS:**

Subjects receiving MFR displayed significant improvements in pain (SF-MPQ) (mean difference -7.8; 95% CI: -14.5 to -1.1, P=0.023) and sensory SF-MPQ subscale (mean difference -6.1; 95% CI: -10.8 to -1.5, P=0.011) compared to the sham group, but no differences were found in VAS between groups. Disability and the FABQ score also displayed a significant decrease in the MFR group (P<0.05) as compared to sham MFR.

**CONCLUSION:**

Myofascial Release Therapy produced a significant improvement in both pain and disability. However, as the minimal clinically important differences in pain and disability are included in the 95% IC, we can not know if this improvement is clinically relevant.

**LEVEL OF EVIDENCE:**

2.

**45 B. MANUAL THERAPY CERVICAL****Manual therapy and expectations**

Eur J Pain. 2016 Oct;20(9):1384-91. doi: 10.1002/ejp.861. Epub 2016 Mar 31.

**Expectations of recovery: A prognostic factor in patients with neck pain undergoing manual therapy treatment.**

Palmlöf L<sup>1</sup>, Holm LW<sup>2</sup>, Alfredsson L<sup>2,3</sup>, Skillgate E<sup>2,4</sup>.

Author information

Abstract

**BACKGROUND:**

Expectations have been investigated in populations seeking care for neck pain, however not considering potential confounding factors. The aim of this study was to investigate if pretreatment expectations of recovery is a prognostic factor for recovery from neck pain at 7 weeks follow-up in patients seeking manual therapy treatment.

**METHOD:**

The study was based on the Stockholm Manual Intervention Trial, a randomized controlled trial investigating efficiency of three combinations of manual therapy. The patients with neck pain were included in this study (n = 716). Expectations of recovery was measured at baseline; 'How likely is it, according to your judgment, that you are completely recovered from your neck/back problems in 7 weeks'. Patients answered on a 11-point scale, further categorized into low, moderate and high expectations. The outcome was measured at 7 weeks follow-up by a modified version of the Global Perceived Recovery Question. Potential effect measure modifiers and confounders were measured at baseline. Multivariable log binomial regression models were used to analyse the association between expectations and recovery, presented as relative risks and 95% confidence intervals (CI).

**RESULTS:**

High expectations of recovery yielded a 47% increased probability of being recovered at 7 weeks follow-up. High expectations of recovery yielded improved recovery in both men and women separately, but moderate expectations yielded improved recovery only among men.

**CONCLUSION:**

Our results suggest that expectations of recovery is a prognostic factor for recovery in patients with neck pain seeking manual therapy treatment. **WHAT DOES THIS STUDY ADD?:** We found that high expectations of recovery yielded a higher probability of recovery compared to having low expectations, also when considering potential confounding factors. Expectations seemed to have a more distinct influence on recovery among men.

**46 A. UPPER LIMB NEUROMOBILIZATION****HA/STM and neuromob**

Arch Phys Med Rehabil. 2016 Sep 10. pii: S0003-9993(16)30958-3. doi: 10.1016/j.apmr.2016.08.466.

**Effectiveness of a Treatment Involving Soft Tissue Techniques and/or Neural Mobilization Techniques in the Management of the Tension-Type Headache: A Randomized Controlled Trial.**

Ferragut-Garcías A<sup>1</sup>, Plaza-Manzano G<sup>2</sup>, Rodríguez-Blanco C<sup>3</sup>, Velasco-Roldán O<sup>1</sup>, Pecos-Martín D<sup>4</sup>, Oliva-Pascual-Vaca J<sup>5</sup>, Llabrés-Bennasar B<sup>6</sup>, Oliva-Pascual-Vaca Á<sup>7</sup>.

Author information

Abstract

**OBJECTIVE:**

To evaluate the effects of a protocol involving soft tissue techniques and/or Neural Mobilization Techniques in the management of patients with Frequent episodic tension-type headache (FETTH) and Chronic tension-type headache (CTTH).

**DESIGN:**

Randomized controlled, double blind, placebo control and before-after trial.

**SETTING:**

Rehabilitation area of Son Llatzer Hospital and Fisioplanet Centre PARTICIPANTS: Ninety-seven patients (78 women; 19 men) diagnosed with FETTH or CTTH, were randomly assigned to groups A, B, C or D.

**INTERVENTIONS:**

(A) placebo superficial massage; (B) soft tissue techniques; (C) neural mobilization; (D) a combination of (B) and (C).

**MAIN OUTCOMES MEASURES:**

The pressure pain threshold (PPT) in the temporal muscles (PPT<sub>1</sub>, PPT<sub>2</sub>) and supraorbital region (PPT<sub>3</sub>), the frequency (Freq) and maximal intensity (Int) of the pain crisis, and the punctuation using the Hit-6 questionnaire (Hit6) were evaluated. All variables were assessed before, at the end of the treatment and 15 days and 30 days post-intervention.

**RESULTS:**

Groups B, C, and D had an increase of PPT and a reduction of Freq, Int, and Hit-6 in all time-points after the intervention compared to baseline and Group A ( $p < 0.001$  in all cases). Group D had the highest PPT values and the lowest values in Freq and Hit-6 after the intervention.

**CONCLUSIONS:**

The application of soft tissue techniques and neural mobilization in FETTH or CTTH patients induces significant changes in pressure pain threshold, the characteristics of the pain crisis, and its impact on daily life activities compared to the application of these techniques as isolated interventions.

**Median nerve mobility in Carpal tunnel**

J Hand Ther. 2016 Sep 28. pii: S0894-1130(16)30131-4. doi: 10.1016/j.jht.2016.09.002.

**Is there a relationship between impaired median nerve excursion and carpal tunnel syndrome? A systematic review.**

Ellis R<sup>1</sup>, Blyth R<sup>2</sup>, Arnold N<sup>2</sup>, Miner-Williams PhD W<sup>3</sup>.

***STUDY DESIGN:***

Systematic review.

***INTRODUCTION:***

It is accepted that the etiology of carpal tunnel syndrome (CTS) is multifactorial. One of the most commonly accepted etiologic factors for CTS is compromise of the kinematic behavior and excursion of the median nerve.

***PURPOSE OF THE STUDY:***

The objective of this systematic review was to establish if there is a relationship between impaired median nerve excursion and CTS.

***METHODS:***

A systematic review, following the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines, was conducted. Studies were sought where in vivo median nerve excursion was compared between people with CTS to an appropriate control group. Quality appraisal for each study was conducted using the Newcastle-Ottawa Scale by 2 independent evaluators.

***RESULTS:***

Ten case-control studies using ultrasound imaging to quantify median nerve excursion were included. All studies were rated as of "moderate" methodologic quality having scored 6 or 7 (of 9 stars) for the Newcastle-Ottawa Scale. Seven of the 10 studies concluded that median nerve excursion was reduced in a CTS population when compared with controls.

***CONCLUSION:***

The literature suggests that median nerve excursion is reduced in people with CTS when compared with healthy controls.

***LEVEL OF EVIDENCE:***

3a.

**48 A. STM****HA and STM**

Arch Phys Med Rehabil. 2016 Sep 10. pii: S0003-9993(16)30958-3. doi: 10.1016/j.apmr.2016.08.466

**Effectiveness of a Treatment Involving Soft Tissue Techniques and/or Neural Mobilization Techniques in the Management of the Tension-Type Headache: A Randomized Controlled Trial.**

Ferragut-Garcías A<sup>1</sup>, Plaza-Manzano G<sup>2</sup>, Rodríguez-Blanco C<sup>3</sup>, Velasco-Roldán O<sup>1</sup>, Pecos-Martín D<sup>4</sup>, Oliva-Pascual-Vaca J<sup>5</sup>, Llabrés-Bennasar B<sup>6</sup>, Oliva-Pascual-Vaca Á<sup>7</sup>.

**OBJECTIVE:**

To evaluate the effects of a protocol involving soft tissue techniques and/or Neural Mobilization Techniques in the management of patients with Frequent episodic tension-type headache (FETTH) and Chronic tension-type headache (CTTH).

**DESIGN:**

Randomized controlled, double blind, placebo control and before-after trial.

**SETTING:**

Rehabilitation area of Son Llatzer Hospital and Fisioplanet Centre PARTICIPANTS: Ninety-seven patients (78 women; 19 men) diagnosed with FETTH or CTTH, were randomly assigned to groups A, B, C or D.

**INTERVENTIONS:**

(A) placebo superficial massage; (B) soft tissue techniques; (C) neural mobilization; (D) a combination of (B) and (C).

**MAIN OUTCOMES MEASURES:**

The pressure pain threshold (PPT) in the temporal muscles (PPT<sub>1</sub>, PPT<sub>2</sub>) and supraorbital region (PPT<sub>3</sub>), the frequency (Freq) and maximal intensity (Int) of the pain crisis, and the punctuation using the Hit-6 questionnaire (Hit6) were evaluated. All variables were assessed before, at the end of the treatment and 15 days and 30 days post-intervention.

**RESULTS:**

Groups B, C, and D had an increase of PPT and a reduction of Freq, Int, and Hit-6 in all time-points after the intervention compared to baseline and Group A ( $p < 0.001$  in all cases). Group D had the highest PPT values and the lowest values in Freq and Hit-6 after the intervention.

**CONCLUSIONS:**

The application of soft tissue techniques and neural mobilization in FETTH or CTTH patients induces significant changes in pressure pain threshold, the characteristics of the pain crisis, and its impact on daily life activities compared to the application of these techniques as isolated interventions.

**48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE****Upper traps**

Acupunct Med. 2016 Oct 3. pii: acupmed-2016-011082. doi: 10.1136/acupmed-2016-011082.

**Therapeutic effects of dry needling in patients with upper trapezius myofascial trigger points.**

Abbaszadeh-Amirdehi M<sup>1</sup>, Ansari NN<sup>2</sup>, Naghdi S<sup>2</sup>, Olyaei G<sup>2</sup>, Nourbakhsh MR<sup>3</sup>.

**BACKGROUND:**

Active myofascial trigger points (MTrPs) are major pain generators in myofascial pain syndrome. Dry needling (DN) is an effective method for the treatment of MTrPs.

**OBJECTIVE:**

To assess the immediate neurophysiological and clinical effects of DN in patients with upper trapezius MTrPs.

**METHODS:**

This was a prospective, clinical trial study of 20 patients with upper trapezius MTrPs and 20 healthy volunteers (matched for height, weight, body mass index and age), all of whom received one session of DN. Primary outcome measures were neuromuscular junction response (NMJR) and sympathetic skin response (SSR). Secondary outcomes were pain intensity (PI) and pressure pain threshold (PPT). Data were collected at baseline and immediately post-intervention.

**RESULTS:**

At baseline, SSR amplitude was higher in patients versus healthy volunteers ( $p < 0.003$ ). With respect to NMJR, a clinically abnormal increment and normal reduction was observed in patients and healthy volunteers, respectively. Moreover, PPT of patients was less than healthy volunteers ( $p < 0.0001$ ). After DN, SSR amplitude decreased significantly in patients ( $p < 0.01$ ), but did not change in healthy volunteers. A clinically important reduction in the NMJR of patients and increment in healthy volunteers was demonstrated after DN. PPT increased after DN in patients, but decreased in healthy volunteers ( $p < 0.0001$ ). PI improved after DN in patients ( $p < 0.001$ ).

**CONCLUSIONS:**

The results of this study showed that one session of DN targeting active MTrPs appears to reduce hyperactivity of the sympathetic nervous system and irritability of the motor endplate. DN seems effective at improving symptoms and deactivating active MTrPs, although further research is needed.

**TRIAL REGISTRATION NUMBER:**

IRCT20130316128

**TMJ and bruxism**

Acupunct Med. 2016 Oct 3. pii: acupmed-2016-011102. doi: 10.1136/acupmed-2016-011102.

**Effects of myofascial trigger point dry needling in patients with sleep bruxism and temporomandibular disorders: a prospective case series.**

Blasco-Bonora PM<sup>1</sup>, Martín-Pintado-Zugasti A<sup>2</sup>.

**OBJECTIVES:**

To investigate the effects of deep dry needling (DN) of myofascial trigger points (MTrPs) of the masseter and temporalis on pain, pressure pain threshold (PPT), pain-free maximal jaw opening and temporomandibular disorder (TMD)-related disability in patients with sleep bruxism (SB) and myofascial TMD.

**METHODS:**

Seventeen subjects (11 women, 6 men) aged 39±13 years (range 23-66) diagnosed with SB and myofascial TMD were invited to participate in this prospective case series study. Each subject received a deep DN intervention in the masseter and temporalis MTrPs. Pain intensity, PPT, pain-free maximal jaw opening and TMD-related disability were assessed before treatment, immediately after treatment and at 1-week follow-up. Jaw disability was assessed using the jaw disability checklist (JDC) at baseline and 1 week post-treatment only.

**RESULTS:**

One-way analyses of variance showed significant improvements in pain intensity, PPT and jaw opening ( $p<0.001$ ). Post-hoc analysis revealed significant differences between baseline and post-intervention follow-up time points in pain (immediate: Cohen's  $d=1.72$ ,  $p<0.001$ ; 1 week:  $d=3.24$ ,  $p<0.001$ ), jaw opening (immediate:  $d=0.77$ ,  $p<0.001$ ; 1 week:  $d=1.02$ ,  $p<0.001$ ) and PPT in the masseter (immediate:  $d=1.02$ ,  $p<0.001$ ; 1 week:  $d=1.64$ ,  $p<0.001$ ) and temporalis (immediate:  $d=0.91$ ,  $p=0.006$ ; 1 week:  $d=1.8$ ,  $p<0.001$ ). A dependent t-test showed a significant improvement in jaw functioning, reflected by a large reduction in 1-week JDC scores relative to baseline ( $d=3.15$ ,  $p<0.001$ ).

**CONCLUSIONS:**

Deep DN of active MTrPs in the masseter and temporalis in patients with myofascial TMD and SB was associated with immediate and 1-week improvements in pain, sensitivity, jaw opening and TMD-related disability.

**TRIAL REGISTRATION NUMBER:**

NCT02587182; Results.

**53. CORE****Muscle activation with Pilates**

Arch Phys Med Rehabil. 2016 Sep 29. pii: S0003-9993(16)31097-8. doi: 10.1016/j.apmr.2016.09.111.

**Muscle activation during Pilates exercises in participants with chronic non-specific low back pain - a cross-sectional case control study.**

de Oliveira NT<sup>1</sup>, Ferreira Freitas SM<sup>1</sup>, Fuhro FF<sup>1</sup>, da Luz Júnior MA<sup>2</sup>, Amorim CF<sup>1</sup>, Nunes Cabral CM<sup>3</sup>.

**OBJECTIVE:**

To determine the amplitude of the electromyographic activity of trunk muscles during Pilates exercises in women with and without chronic low back pain (LBP).

**DESIGN:**

Case control study.

**SETTING:**

Clinic of a school.

**PARTICIPANTS:**

Sixty women divided into LBP Group (LBPG) and Control Group (CG).

**INTERVENTIONS:**

Not applicable.

**MAIN OUTCOME MEASURES:**

Amplitude of the electromyographic activity (root mean square values) of the gluteus maximus and external oblique muscles collected during three Pilates exercises: Shoulder bridge performed in the mat, and Hip roll and Breathing performed in equipment. Pain intensity was assessed in the LBPG.

**RESULTS:**

The amplitude of the electromyographic activity was similar between groups ( $p \geq 0.05$ ). For both groups, the amplitude of the gluteus maximus was higher in the Shoulder Bridge exercise compared to the Hip Roll with 2 springs (CG: mean difference (MD) = 0.18, 95% Confidence interval (CI) = 0.05 to 0.41; LBPG: MD = 0.29, 95% CI = 0.16 to 0.31) and the Breathing exercise (CG: MD = -0.40, 95% CI = -0.55 to -0.26; LBPG: MD = -0.36, 95% CI = -0.52 to -0.20). The amplitude of the external oblique muscle was higher in the Shoulder Bridge compared to the Hip Roll with 2 springs (CG: MD = 0.13, 95% CI = 0.05 to 0.21; LBPG: MD = 0.18, 95% CI = 0.03 to 0.33). Pain intensity increased after exercises, but this increase was lower for the mat exercises.

**CONCLUSION:**

Similar muscle activation between groups was found. The findings suggest that mat exercises caused less pain and greater difference in the amplitude of muscle activation compared to the equipment-based exercises.

**54. POSTURE****Benefit of active postural correction**

Women Health. 2016 Oct 4.

**Active Self-Correction of Spinal Posture in Pain-Free Women in Response to the Command "Straighten Your Back".**

Barczyk-Pawelec K<sup>1</sup>, Tomasz S<sup>1</sup>.

Evidence is limited regarding the regional changes in spinal posture after self-correction. The aim of the present study was to evaluate whether active self-correction improved standing and sitting spinal posture. Photogrammetry was used to assess regional spinal curvatures and vertical global spine orientation (GSO) in 42 asymptomatic women aged 20-24 years. Upper thoracic spine angle and GSO increased in response to self-correction, while the thoracolumbar and lumbosacral angles decreased. Self-correction in the standing position resulted in decreased inclination of the upper thoracic and thoracolumbar spinal angles. Correction of sitting posture reduced the angle of the upper thoracic spine and GSO. The effects of active self-correction on spinal curvature and GSO were different for the standing vs. sitting position; the greatest effects of active correction were noted in the thoracic spine. Balanced and lordotic postures were most prevalent in the habitual and actively self-corrected standing positions, whereas the kyphotic posture was most prevalent in the habitual sitting position, indicative that self-correction back posture in the standing position could be an important health-related daily activity, especially during prolonged sitting.

**55. SCOLIOSIS****Scoliosis surgery and LFC nerve damage**

Spine (Phila Pa 1976). 2016 Oct 1;41(19):E1164-7. doi: 10.1097/BRS.0000000000001574.

**Lateral Femoral Cutaneous Nerve Palsy After Spinal Fusion for Adolescent Idiopathic Scoliosis (AIS).**

Sanders AE<sup>1</sup>, Andras LM, Choi PD, Tolo VT, Skaggs DL.

**STUDY DESIGN:**

Prospective study of consecutive patients.

**OBJECTIVE:**

The purpose of the study was to evaluate the incidence, risk factors, and time to resolution of lateral femoral cutaneous nerve palsy (LFCNP) after posterior spinal fusion (PSF) for adolescent idiopathic scoliosis (AIS).

**SUMMARY OF BACKGROUND DATA:**

No prior studies have prospectively evaluated the prevalence of LFCNP exclusively in the treatment of AIS.

**METHODS:**

Between June 2014 and May 2015, patients undergoing PSF for AIS were examined preoperatively, postoperatively, and at follow-up clinic visits until the resolution of the LFCNP. All neurologic examinations were performed by attending pediatric orthopedic surgeons. Patients who underwent staged, revision or anterior procedures, had preoperative neurologic deficits or neuropathy, were excluded.

**RESULTS:**

A total of 55 patients with an average age of 14 years (10-21) were enrolled. Twenty-five percent (14/55) of patients had a postoperative LFCNP. There were no other postoperative neurologic deficits. Of the 14 patients with an LFCNP, 57% of these were bilateral. Fourteen percent (2/14) of these patients had absent sensation to light touch, whereas 85% (12/14) had decreased sensation. No patients reported experiencing pain associated with the LFCNP or tenderness when the anterolateral thigh was palpated. The LFCNP did not limit postoperative mobilization or prolong hospital stay. The LFCNP was noted to resolve in an average of 3.6 days (1-18); 6/14 (43%) resolved after 1 day. No correlation was observed between occurrence of LFCNP and sex, age, height, body mass index, length of fusion, Cobb angle, or blood loss. The occurrence of LFCNP was associated with heavier weight (P=0.032) and longer operative times (P=0.016). Resolution of the LFCNP was associated with longer operative time (P=0.010).

**CONCLUSION:**

LFCNP occurred in 25% of AIS patients undergoing PSF. Risk of LFCNP increased with longer operative times and heavier patient weight. On average, LFCNP resolved in less than 4 days and did not cause any pain or limitations.

## 56. ATHLETICS

### Deaths in high school athletes

Mayo Clin Proc. 2016 Sep 28. pii: S0025-6196(16)30451-7. doi: 10.1016/j.mayocp.2016.07.021.

#### **Incidence and Etiology of Sudden Cardiac Arrest and Death in High School Athletes in the United States.**

Harmon KG<sup>1</sup>, Asif IM<sup>2</sup>, Maleszewski JJ<sup>3</sup>, Owens DS<sup>4</sup>, Prutkin JM<sup>4</sup>, Salerno JC<sup>4</sup>, Zigman ML<sup>4</sup>, Ellenbogen R<sup>5</sup>, Rao AL<sup>4</sup>, Ackerman MJ<sup>3</sup>, Drezner JA<sup>4</sup>.

#### **OBJECTIVE:**

To determine the incidence and etiology of sudden cardiac arrest and death (SCA/D) in US high school athletes.

#### **PATIENTS AND METHODS:**

A prospective media database of SCA/D was queried for cases aged 14 to 18 years from 7 states over 6 school years (September 1, 2007, to August 30, 2013). Event details were investigated to determine participation on a high school athletic team, sex, sport, and occurrence during school-sponsored activity or exertion. National sports participation numbers were used and a conversion factor was applied to account for multisport athletes. Autopsy reports were reviewed and cause of death was adjudicated by an expert panel.

#### **RESULTS:**

A total of 16,390,409 million athlete-seasons representing 6,974,640 athlete-years (AY) were examined, encompassing 36% of the total US high school athlete population. A total of 104 cases of SCA/D were identified (35 SCA with survival and 69 sudden cardiac deaths [SCDs]). The rate of SCD was 1:101,082 AY and of SCA/D 1:67,064 AY. Eighty-eight percent (92) of events occurred in male athletes. The rate of SCA/D in male athletes was 1:44,832 AY and in female athletes 1:237,510 AY (incidence rate ratio, 5.3; 95% CI, 2.9-10.6; P<.001). Men's basketball was the highest risk sport with an SCA/D incidence of 1:37,087 AY followed by men's football at 1:86,494 AY. Men's basketball and football athletes accounted for 57% (39) of deaths. Eighty percent of SCDs (55 of 69) were exertional and 55% (38 of 69) occurred while playing for a school-sponsored team. Autopsy reports were obtained in 73% (50) of cases. The most common findings of autopsy were idiopathic left ventricular hypertrophy or possible cardiomyopathy (13 of 50 [26%]), autopsy-negative sudden unexplained death (9 of 50 [18%]), hypertrophic cardiomyopathy (7 of 50 [14%]), and myocarditis (7 of 50 [14%]).

#### **CONCLUSION:**

The rate of SCA/D in male high school athletes was 1:44,832 AY, with almost half due to possible or confirmed cardiomyopathy disease. It is likely that many cases were not identified because of reliance on media reports, and these numbers represent a minimum estimate.

**Cycling and resistance training**

Scand J Med Sci Sports. 2016 Sep 23. doi: 10.1111/sms.12751.

**Effects of high-intensity interval cycling performed after resistance training on muscle strength and hypertrophy.**

Tsitkanou S<sup>1</sup>, Spengos K<sup>2</sup>, Stasinaki AN<sup>3</sup>, Zaras N<sup>3</sup>, Bogdanis G<sup>3</sup>, Papadimas G<sup>2</sup>, Terzis G<sup>3</sup>.

Aim of the study was to investigate whether high-intensity interval cycling performed immediately after resistance training would inhibit muscle strength increase and hypertrophy expected from resistance training per se.

Twenty-two young men were assigned into either resistance training (RE; N = 11) or resistance training plus high-intensity interval cycling (REC; N = 11). Lower body muscle strength and rate of force development (RFD), quadriceps cross-sectional area (CSA) and vastus lateralis muscle architecture, muscle fiber type composition and capillarization, and estimated aerobic capacity were evaluated before and after 8 weeks of training (2 times per week). Muscle strength and quadriceps CSA were significantly and similarly increased after both interventions. Fiber CSA increased significantly and similarly after both RE (type I:  $13.6 \pm 3.7\%$ , type IIA:  $17.6 \pm 4.4\%$ , type IIX:  $23.2 \pm 5.7\%$ ,  $P < 0.05$ ) and REC (type I:  $10.0 \pm 2.7\%$ , type IIA:  $14.8 \pm 4.3\%$  type IIX:  $20.8 \pm 6.0\%$ ,  $P < 0.05$ ). In contrast, RFD decreased and fascicle angle increased ( $P < 0.05$ ) only after REC. Capillary density and estimated aerobic capacity increased ( $P < 0.05$ ) only after REC.

These results suggest that high-intensity interval cycling performed after heavy-resistance exercise may not inhibit resistance exercise-induced muscle strength/hypertrophy after 2 months of training, while it prompts aerobic capacity and muscle capillarization. The addition of high-intensity cycling after heavy-resistance exercise may decrease RFD partly due to muscle architectural changes.

## 59. PAIN

### Placebo and pain

#### Study finds knowingly taking placebo pills eases pain

Beth Israel Deaconess Medical Center, 10/18/2016

**F**ake pills' reduced pain and disability in patients with low back pain.

Conventional medical wisdom has long held that placebo effects depend on patients' belief they are getting pharmacologically active medication. A paper published online in the journal *Pain* is the first to demonstrate that patients who knowingly took a placebo in conjunction with traditional treatment for lower back pain saw more improvement than those given traditional treatment alone.

“These findings turn our understanding of the placebo effect on its head,” said joint senior author Ted Kaptchuk, director of the Program for Placebo Studies and the Therapeutic Encounter at Beth Israel Deaconess Medical Center and an associate professor of medicine at Harvard Medical School. “This new research demonstrates that the placebo effect is not necessarily elicited by patients' conscious expectation that they are getting an active medicine, as long thought. Taking a pill in the context of a patient–clinician relationship – even if you know it's a placebo – is a ritual that changes symptoms and probably activates regions of the brain that modulate symptoms.”

Kaptchuk, with colleagues at Instituto Superior de Psicologia Aplicada (ISPA) in Lisbon, Portugal, studied 97 patients with chronic lower back pain (cLBP), which causes more disability than any other medical condition worldwide. After all participants were screened and examined by a registered nurse practitioner and board certified pain specialist, the researchers gave all patients a 15–minute explanation of the placebo effect. Only then was the group randomized into one of two groups; the treatment–as–usual (TAU) group or the open–label placebo (OLP) group. The vast majority of participants in both groups (between 85 and 88 percent) were already taking medications – mostly non–steroidal anti–inflammatories (NSAIDs) – for their pain. (Patients taking opioid medications were excluded from the trial.) Participants in both the TAU and OLP groups were allowed to continue taking these drugs, but were required not to change dosages or make any other major lifestyle changes, such as starting an exercise plan or new medication, which could impact their pain.

In addition, patients in the OLP group were given a medicine bottle labeled “placebo pills” with directions to take two capsules containing only microcrystalline cellulose and no active medication twice daily. At the end of their three–week course of pills, the OLP group overall reported 30 percent reductions in both usual pain and maximum pain, compared to 9 percent and 16 percent reductions, respectively, for the TAU group. The group taking placebo pills also saw a 29 percent drop in pain–related disability. Those receiving treatment as usual saw almost no improvement by that measure.

“It's the benefit of being immersed in treatment: interacting with a physician or nurse, taking pills, all the rituals and symbols of our healthcare system,” Kaptchuk said. “The body responds to

that.”

“Taking placebo pills to relieve symptoms without a warm and empathic relationship with a health-care provider relationship probably would not work,” noted Carvalho.

## 60. COMPLEX REGIONAL PAIN

### Spinal cord stim

Pain Pract. 2016 Oct 14. doi: 10.1111/papr.12513.

#### **A Comprehensive Outcome-Specific Review of the Use of Spinal Cord Stimulation for Complex Regional Pain Syndrome.**

Visnjevac O<sup>1</sup>, Costandi S<sup>2</sup>, Patel BA<sup>1</sup>, Azer G<sup>2</sup>, Agarwal P<sup>1</sup>, Bolash R<sup>2</sup>, Mekhail NA<sup>3</sup>.

#### **BACKGROUND:**

Complex regional pain syndrome (CRPS) is a painful, debilitating affliction that is often difficult to treat. It has become common international practice to use spinal cord stimulation (SCS) for the treatment of CRPS as other therapies fail to provide adequate relief, quality of life, or improvement in function. This comprehensive outcome-specific systematic review of the use of SCS for CRPS was performed to elucidate the available evidence with focus on clinically relevant patient-specific outcomes.

#### **METHODS:**

A systematic review of the literature was conducted to evaluate the effects of SCS on patients with CRPS for the following outcomes and provide summary levels of evidence in regard to each outcome: perceived pain relief, pain score, resolution of CRPS signs, functional status, quality of life, psychological impact, sleep hygiene, analgesic medication utilization, and patient satisfaction with SCS therapy. Search terms included "complex regional pain syndrome," "spinal cord stimulation," and "reflex sympathetic dystrophy," without restriction of language, date, or type of publication, albeit only original data were included in analyses. Of 30 studies selected, seven systematic reviews were excluded, as were four studies reporting combination therapy that included SCS and other therapies (ie, concurrent peripheral nerve stimulation, intrathecal therapy) without clear delineation to the effect of SCS alone on outcomes. A total of 19 manuscripts were evaluated.

#### **RESULTS:**

Perceived pain relief, pain score improvement, quality of life, and satisfaction with SCS were all rated 1B+, reflecting positive high-level (randomized controlled trial) evidence favoring SCS use for the treatment of CRPS. Evidence for functional status improvements and psychological effects of SCS was inconclusive, albeit emanating from a randomized controlled trial (evidence level 2B±), and outcomes evidence for both sleep hygiene and resolution of CRPS signs was either nonexistent or of too low quality from which to draw conclusions (evidence level 0). An analgesic sparing effect was observed in nonrandomized reports, reflecting an evidence level of 2C+.

#### **CONCLUSIONS:**

Spinal cord stimulation remains a favorable and effective modality for treating CRPS with high-level evidence (1B+) supporting its role in improving CRPS patients' perceived pain relief, pain

score, and quality of life. A paucity of evidence for functional improvements, resolution of CRPS signs, sleep hygiene, psychological impact, and analgesic sparing effects mandate further investigation before conclusions can be drawn for these specific outcomes.

### 62 A. NUTRITION/VITAMINS

#### Increased mortality with sodium intake

Original Investigation | October 2016

#### **Sodium Intake and All-Cause Mortality Over 20 Years in the Trials of Hypertension Prevention**

Nancy R. Cook, ScDa; Lawrence J. Appel, MD; Paul K. Whelton, MD

**Background** The relationship between lower sodium intake and total mortality remains controversial.

**Objectives** This study examined the relationship between well-characterized measures of sodium intake estimated from urinary sodium excretion and long-term mortality.

**Methods** Two trials, phase I (1987 to 1990), over 18 months, and phase II (1990 to 1995), over 36 months, were undertaken in TOHP (Trials of Hypertension Prevention), which implemented sodium reduction interventions. The studies included multiple 24-h urine samples collected from pre-hypertensive adults 30 to 54 years of age during the trials. Post-trial deaths were ascertained over a median 24 years, using the National Death Index. The associations between mortality and the randomized interventions as well as with average sodium intake were examined.

**Results** Among 744 phase I and 2,382 phase II participants randomized to sodium reduction or control, 251 deaths occurred, representing a nonsignificant 15% lower risk in the active intervention (hazard ratio [HR]: 0.85; 95% confidence interval [CI]: 0.66 to 1.09;  $p = 0.19$ ).

Among 2,974 participants not assigned to an active sodium intervention, 272 deaths occurred. There was a direct linear association between average sodium intake and mortality, with an HR of 0.75, 0.95, and 1.00 (references) and 1.07 ( $p$  trend = 0.30) for <2,300, 2,300 to <3,600, 3,600 to <4,800, and  $\geq 4,800$  mg/24 h, respectively; and with an HR of 1.12 per 1,000 mg/24 h (95% CI: 1.00 to 1.26;  $p = 0.05$ ). There was no evidence of a J-shaped or nonlinear relationship. The HR per unit increase in sodium/potassium ratio was 1.13 (95% CI: 1.01 to 1.27;  $p = 0.04$ ).

**Conclusions** We found an increased risk of mortality for high-sodium intake and a direct relationship with total mortality, even at the lowest levels of sodium intake. These results are consistent with a benefit of reduced sodium and sodium/potassium intake on total mortality over a 20-year period.

**Perspectives**

**COMPETENCY IN MEDICAL KNOWLEDGE:** Studies that used accurate measurements have found lower sodium intake beneficial.

**TRANSLATIONAL OUTLOOK:** New strategies are needed to reduce the amount of sodium in the food supply and to educate people about the importance of dietary sodium restriction.

**Calcium and weight loss**

Am J Clin Nutr. 2016 Oct 12. pii: ajcn136242.

**Effects of calcium supplementation on body weight: a meta-analysis.**

Li P<sup>1</sup>, Fan C<sup>1</sup>, Lu Y<sup>1</sup>, Qi K<sup>2</sup>.

**BACKGROUND:**

Whether calcium supplementation can reduce body weight and prevent obesity remains unclear because of inconsistent reports.

**OBJECTIVE:**

We performed a meta-analysis to investigate the correlations between calcium supplementation and changes in body weight on the basis of age, sex, body mass index (BMI) of the subjects, and length of calcium intervention.

**DESIGN:**

PubMed, EMBASE, Web of Knowledge, and China National Knowledge Infrastructure databases were systematically searched to select relevant studies that were published from January 1994 to March 2016. Both randomized controlled trials and longitudinal studies of calcium supplementation were included, and random- or fixed-effects models in a software program were used for the data analysis.

**RESULTS:**

Thirty-three studies involving a total of 4733 participants were included in this meta-analysis. No significant differences in weight changes were shown between calcium intervention and control groups (mean: -0.01 kg; 95% CI: -0.02, 0.00 kg; P = 0.12). However, negative correlations between calcium supplementation and weight changes were shown in children and adolescents (mean: -0.26 kg; 95% CI: -0.41, -0.11 kg; P < 0.001) and in adult men and either premenopausal or old (>60 y of age) women (mean: -0.91 kg; 95% CI: -1.38, -0.44 kg; P < 0.001) but not in postmenopausal women (mean: -0.14 kg; 95% CI: -0.54, 0.26 kg; P = 0.50). When BMI was considered, a negative correlation between calcium supplementation and weight changes was observed in subjects with normal BMI (mean: -0.53 kg; 95% CI: -0.89, -0.16 kg; P = 0.005) but not in overweight or obese subjects (mean: -0.35 kg; 95% CI: -0.81, 0.11 kg; P = 0.14). Compared with the control groups, no differences in weight changes were shown in the calcium-intervention groups when the lengths of calcium interventions were <6 mo (mean: -0.09 kg; 95% CI: -0.45, 0.26 kg; P = 0.60) or ≥6 mo (mean: -0.01 kg; 95% CI: -0.02, 0.01 kg; P = 0.46).

**CONCLUSION:**

Increasing calcium intake through calcium supplements can reduce body weight in subjects who have a normal BMI or in children and adolescents, adult men, or premenopausal women.

**CA and weight loss**

Am J Clin Nutr. 2016 Oct 12. pii: ajcn136242.

**Effects of calcium supplementation on body weight: a meta-analysis.**

Li P<sup>1</sup>, Fan C<sup>1</sup>, Lu Y<sup>1</sup>, Qi K<sup>2</sup>.

**BACKGROUND:**

Whether calcium supplementation can reduce body weight and prevent obesity remains unclear because of inconsistent reports.

**OBJECTIVE:**

We performed a meta-analysis to investigate the correlations between calcium supplementation and changes in body weight on the basis of age, sex, body mass index (BMI) of the subjects, and length of calcium intervention.

**DESIGN:**

PubMed, EMBASE, Web of Knowledge, and China National Knowledge Infrastructure databases were systematically searched to select relevant studies that were published from January 1994 to March 2016. Both randomized controlled trials and longitudinal studies of calcium supplementation were included, and random- or fixed-effects models in a software program were used for the data analysis.

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**CONCLUSION:**

Increasing calcium intake through calcium supplements can reduce body weight in subjects who have a normal BMI or in children and adolescents, adult men, or premenopausal women.

**Green roasted coffee helps metabolic syndrome****Regularly consuming a green/roasted coffee blend reduces the risk of metabolic syndrome**

European Journal of Nutrition, 10/14/2016

Sarriá B, et al.

This study was conducted to assess the impacts of regularly consuming a green/roasted coffee blend (35/65) on the main components of MetS in humans. The findings demonstrate that regular consumption of the green/roasted coffee blend might be recommended to healthy and hypercholesterolaemic subjects to prevent MetS, as it produces beneficial outcomes on blood pressure, glucose and triglyceride levels.

**Methods**

- A crossover, randomized, controlled study was conducted.
- This study was performed in 25 normocholesterolaemic and 27 hypercholesterolaemic men and women aged 18–45 years with BMI 18–25 kg/m<sup>2</sup>.
- 3 servings/day of the blend, providing 510.6 mg hydroxycinnamic acids and 121.2 mg caffeine/day, were consumed versus a control drink, during 8 weeks each.
- Polyphenol and methylxanthine-rich foods were confined along the study.
- At the beginning (baseline) and end of the control and coffee interventions, blood samples were gathered and glucose, HDL-cholesterol, triglycerides, insulin, leptin, plasminogen activator inhibitor-1 (PAI-1), resistin and visfatin were analysed; waist circumference, %body fat, and blood pressure were measured and dietary records and physical activity questionnaires completed.

**Results**

- Researchers found that systolic and diastolic blood pressure diminished ( $p = 0.001$  and  $p < 0.001$ , respectively) in both groups as well as %body fat ( $p = 0.001$ ) which may be related to the lower leptin ( $p = 0.001$ ), PAI-1 ( $p < 0.001$ ) and resistin ( $p = 0.034$ ) levels in the 2 groups after coffee consumption.
- The results of this study showed that glucose concentration ( $p = 0.030$ ) and insulin resistance ( $p = 0.011$ ; HOMA-IR) also diminished, as well as triglyceride levels ( $p = 0.017$ ), so that the reduction was much greater in the hypercholesterolaemics (group effect,  $p = 0.027$ ).

### 62 B. CRYOTHERAPY

#### Pain control with cold therapy

#### **Effects of cold therapy on pain and breathing exercises among median sternotomy patients**

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Pain Management Nursing, 10/14/2016

Zencir G, et al.

**T**he researchers examined the effects of cold therapy on pain and breathing exercises among patients with median sternotomy following cardiac surgery in a randomized crossover clinical trial. In the early period of post-cardiac surgery cold therapy had a positive impact on pain management, however, was not effective for the pain associated with breathing exercises.

**63. PHARMACOLOGY**

**Statin use and decreased mortality**

Lancet. 2012 Aug 11; 380(9841): 581–590.

doi: 10.1016/S0140-6736(12)60367-5 PMID: PMC3437972

## The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials

**Background** - Statins reduce LDL cholesterol and prevent vascular events, but their net effects in people at low risk of vascular events remain uncertain.

**Methods** - This meta-analysis included individual participant data from 22 trials of statin versus control (n=134 537; mean LDL cholesterol difference 1.08 mmol/L; median follow-up 4.8 years) and five trials of more versus less statin (n=39 612; difference 0.51 mmol/L; 5.1 years). Major vascular events were major coronary events (ie, non-fatal myocardial infarction or coronary death), strokes, or coronary revascularisations. Participants were separated into five categories of baseline 5-year major vascular event risk on control therapy (no statin or low-intensity statin) (<5%, ≥5% to <10%, ≥10% to <20%, ≥20% to <30%, ≥30%); in each, the rate ratio (RR) per 1.0 mmol/L LDL cholesterol reduction was estimated.

**Findings** - Reduction of LDL cholesterol with a statin reduced the risk of major vascular events (RR 0.79, 95% CI 0.77–0.81, per 1.0 mmol/L reduction), largely irrespective of age, sex, baseline LDL cholesterol or previous vascular disease, and of vascular and all-cause mortality. The proportional reduction in major vascular events was at least as big in the two lowest risk categories as in the higher risk categories (RR per 1.0 mmol/L reduction from lowest to highest risk: 0.62 [99% CI 0.47–0.81], 0.69 [99% CI 0.60–0.79], 0.79 [99% CI 0.74–0.85], 0.81 [99% CI 0.77–0.86], and 0.79 [99% CI 0.74–0.84]; trend p=0.04), which reflected significant reductions in these two lowest risk categories in major coronary events (RR 0.57, 99% CI 0.36–0.89, p=0.0012, and 0.61, 99% CI 0.50–0.74, p<0.0001) and in coronary revascularisations (RR 0.52, 99% CI 0.35–0.75, and 0.63, 99% CI 0.51–0.79; both p<0.0001). For stroke, the reduction in risk in participants with 5-year risk of major vascular events lower than 10% (RR per 1.0 mmol/L LDL cholesterol reduction 0.76, 99% CI 0.61–0.95, p=0.0012) was also similar to that seen in higher risk categories (trend p=0.3). In participants without a history of vascular disease, statins reduced the risks of vascular (RR per 1.0 mmol/L LDL cholesterol reduction 0.85, 95% CI 0.77–0.95) and all-cause mortality (RR 0.91, 95% CI 0.85–0.97), and the proportional reductions were similar by baseline risk. There was no evidence that reduction of LDL cholesterol with a statin increased cancer incidence (RR per 1.0 mmol/L LDL cholesterol reduction 1.00, 95% CI 0.96–1.04), cancer mortality (RR 0.99, 95% CI 0.93–1.06), or other non-vascular mortality.

**Interpretation** - In individuals with 5-year risk of major vascular events lower than 10%, each 1 mmol/L reduction in LDL cholesterol produced an absolute reduction in major vascular events of about 11 per 1000 over 5 years. This benefit greatly exceeds any known hazards of statin therapy. Under present guidelines, such individuals would not typically be regarded as suitable for LDL-lowering statin therapy. The present report suggests, therefore, that these guidelines might need to be reconsidered.

NSAID's use and heart failure

Research

**Non-steroidal anti-inflammatory drugs and risk of heart failure in four European countries: nested case-control study**

*BMJ* 2016; 354 doi: <http://dx.doi.org/10.1136/bmj.i4857> Andrea Arfè, biostatistician<sup>1</sup>,

1. *Lorenza Scott, Giovanni Corrao, biostatistician*<sup>1</sup>

## Abstract

**Objectives** To investigate the cardiovascular safety of non-steroidal anti-inflammatory drugs (NSAIDs) and estimate the risk of hospital admission for heart failure with use of individual NSAIDs.

**Design** Nested case-control study.

**Setting** Five population based healthcare databases from four European countries (the Netherlands, Italy, Germany, and the United Kingdom).

**Participants** Adult individuals (age  $\geq 18$  years) who started NSAID treatment in 2000-10. Overall, 92 163 hospital admissions for heart failure were identified and matched with 8 246 403 controls (matched via risk set sampling according to age, sex, year of cohort entry).

**Main outcome measure** Association between risk of hospital admission for heart failure and use of 27 individual NSAIDs, including 23 traditional NSAIDs and four selective COX 2 inhibitors. Associations were assessed by multivariable conditional logistic regression models. The dose-response relation between NSAID use and heart failure risk was also assessed.

**Results** Current use of any NSAID (use in preceding 14 days) was found to be associated with a 19% increase of risk of hospital admission for heart failure (adjusted odds ratio 1.19; 95% confidence interval 1.17 to 1.22), compared with past use of any NSAIDs (use  $>183$  days in the past). Risk of admission for heart failure increased for seven traditional NSAIDs (diclofenac, ibuprofen, indomethacin, ketorolac, naproxen, nimesulide, and piroxicam) and two COX 2 inhibitors (etoricoxib and rofecoxib). Odds ratios ranged from 1.16 (95% confidence interval 1.07 to 1.27) for naproxen to 1.83 (1.66 to 2.02) for ketorolac. Risk of heart failure doubled for diclofenac, etoricoxib, indomethacin, piroxicam, and rofecoxib used at very high doses ( $\geq 2$  defined daily dose equivalents), although some confidence intervals were wide. Even medium doses (0.9-1.2 defined daily dose equivalents) of indomethacin and etoricoxib were associated with increased risk. There was no evidence that celecoxib increased the risk of admission for heart failure at commonly used doses.

**Conclusions** The risk of hospital admission for heart failure associated with current use of NSAIDs appears to vary between individual NSAIDs, and this effect is dose dependent. This risk is associated with the use of a large number of individual NSAIDs reported by this study, which could help to inform both clinicians and health regulators