

## ABSTRACTS

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## 2. LBP

### Categorization of LBP

Spine J. 2015 Aug 14. pii: S1529-9430(15)01225-5. doi: 10.1016/j.spinee.2015.08.015.

#### **Classification of patients with incident nonspecific low back pain: implications for research.**

Norton G<sup>1</sup>, McDonough CM<sup>2</sup>, Cabral HJ<sup>3</sup>, Shwartz M<sup>4</sup>, Burgess JF Jr<sup>5</sup>.

Author information

Abstract

**BACKGROUND CONTEXT:** Comparing research studies of low back pain is difficult due to heterogeneity. There is no consensus among researchers regarding inclusion criteria or the definition of an episode.

**PURPOSE:** Determine pattern(s) of recurrent nonspecific low back pain from data collected over 27 months.

**STUDY DESIGN/SETTING:** Retrospective cohort study using administrative claims from multiple payers. While claims are designed for capturing costs, not clinical complexity, they are valid for describing utilization patterns, which are not affected by potential "upcoding".

**PATIENT SAMPLE:** Population-based, nationally generalizable sample of 65,790 adults with continuous medical and pharmaceutical commercial health insurance who received health care for incident, nonspecific low back pain. Potential subjects were excluded for plausible cause of the pain, severe mental illness or cognitive impairment.

**OUTCOME MEASURES:** Diagnostic and therapeutic health care services including medical, surgical, pharmaceutical, and complementary, received in inpatient, outpatient, and emergency settings.

**METHODS:** Latent Class Analysis of health care utilization over 27 months (9 quarters) following index diagnosis of non-specific low back pain occurring in January-March 2009. Analysis sample with 60% of subjects (n= 39,597) and validation sample of 40% (n= 26,193). There were no funding sources or conflicts of interest.

**RESULTS:** Four distinct groups of patients were identified and validated. One group (53.4%) of patients recovered immediately. One third of patients (31.7%) may appear to recover over six months, but maintain a 37-48% likelihood of receiving care for low back pain in every subsequent quarter, implying frequent relapse. Two remaining groups of patients each maintain very high probabilities of receiving care in every quarter (65-78% and 84-90%), predominantly utilizing therapeutic services and pain medication, respectively. Probabilistic grouping relative to alternatives was very high (89.6-99.3%). Grouping was not related to demographic or clinical characteristics.

**CONCLUSIONS:** The four distinct sets of patient experiences have clear implications for research. Inclusion criteria should specify incident or recurrent cases. A six-month clean period may not be sufficiently long to assess incidence. Reporting should specify the proportion recovering immediately to prevent mean recovery rates from masking between-group differences. Continuous measurement of pain or disability may be more reliable than measuring outcomes at distinct endpoints.

**KEYWORDS:** Claims analyses; Classification; Cohort studies; ICD 9 codes; Incident low back pain; Latent class analysis; Natural history; Nonspecific low back pain; Recurrent low back pain  
PMID: 26282103

**LBP in pediatrics**

Eur J Emerg Med. 2015 Oct;22(5):348-54. doi: 10.1097/MEJ.000000000000154.

**Low back pain in the paediatric athlete.**

Roy SL<sup>1</sup>, Shaw PC, Beattie TF.  
Author information

Abstract

**BACKGROUND:**

This study was designed to provide an overview of the epidemiology and clinical findings in children presenting to a sports injury clinic with 'low back pain' (LBP).

**OBJECTIVES:**

The aim of this study was to determine the pattern of presentation, management and outcome of children and adolescents presenting with back pain to a specialist paediatric sports injury clinic.

**MATERIALS AND METHODS:**

A retrospective descriptive review of patients aged 8-16 years presenting with LBP to a specialist at sports injury clinic between January 2004 and December 2010 was performed. Epidemiological variables, historical points and examination features, including several 'red flags', were evaluated in each patient and the findings related to the diagnosis made from the consultant radiologist reported imaging at that time.

**RESULTS:**

A total of 174 patients were analysed. LBP constituted 30% of presentations to the clinic. The median patient age in the study group was 14.0 years, with the male to female ratio of the population analysed being almost 1 : 1. For males, the most prevalent primary sport was rugby and for females, swimming was the most prevalent primary sport. Biomechanical back pain was most frequently diagnosed with spondylolysis, the most prevalent radiological diagnosis.

**CONCLUSION:**

No consistent demonstrable association was established between clinical presentation and final diagnosis. It was found that red flags could not be relied upon for the inclusion or the exclusion of a significant radiological finding. This study therefore suggests that, in this population group, a significant diagnosis cannot always be reliably excluded from clinical assessment alone.

PMID: 24756086

**CB therapy with LBP in rowers**

Br J Sports Med. 2015 Sep;49(17):1125-31. doi: 10.1136/bjsports-2014-093984. Epub 2015 Jan 24.

**Cognitive functional approach to manage low back pain in male adolescent rowers: a randomised controlled trial.**

Ng L<sup>1</sup>, Cañero JP<sup>2</sup>, Campbell A<sup>1</sup>, Smith A<sup>1</sup>, Burnett A<sup>3</sup>, O'Sullivan P<sup>2</sup>.

Author information

Abstract

**BACKGROUND:**

Low back pain (LBP) is prevalent among adolescent rowers. This study evaluated the efficacy of a cognitive functional approach to reduce LBP in this population.

**METHODS:**

Thirty-six adolescent male rowers reporting LBP participated. Nineteen were randomly allocated to the intervention group to receive a cognitive functional approach targeting cognitions, movement patterns, conditioning and lifestyle factors relevant to each rower for 8 weeks. The active control group (n=17) received usual care from their coaches (rowing skills and conditioning exercises). The primary outcome of the study was pain intensity as measured by the Numeric Pain Rating Scale during a 15 min ergometer trial preintervention and postintervention. Disability (Patient Specific Functional Scale and Roland Morris Disability Questionnaire) was measured preintervention/postintervention and at 12 weeks follow-up. Isometric muscle endurance of the back extensors and lower limb muscles, usual sitting posture and regional lumbar kinematic data during a 15 min ergometer row were measured preintervention/postintervention.

**RESULTS:**

Compared with the control group, the intervention group reported significantly less pain during ergometer rowing (Numeric Pain Rating Scale -2.4, p=0.008) and reduced disability (Patient Specific Functional Scale (4.1, p=0.01); Roland Morris Disability Questionnaire (-1.7, p=0.003)) following the intervention, and at 12 weeks follow-up. They also demonstrated greater lower limb muscle endurance (20.9 s, p=0.03) and postured their lower lumbar spine in greater extension during static sitting (-9.6°, p=0.007). No significant differences were reported in back muscle endurance and regional lumbar kinematics during ergometer rowing.

**CONCLUSION:**

Cognitive functional approach was more effective than usual care in reducing pain and disability in adolescent male rowers.

**CLINICAL TRIAL REGISTRY NUMBER:**

Australian and New Zealand Clinical Trial Registry Number 12609000565246.

**KEYWORDS:** Adolescent; Lumbar spine; Physiotherapy; Randomised controlled trial; Rowing  
PMID: 25618890

**Age, genetics and fusion for adjacent segment DJD**

Eur Spine J. 2015 Aug 18.

**Age and pro-inflammatory gene polymorphisms influence adjacent segment disc degeneration more than fusion does in patients treated for chronic low back pain.**

Omair A<sup>1</sup>, Mannion AF, Holden M, Leivseth G, Fairbank J, Hägg O, Fritzell P, Brox JI.  
Author information

**Abstract****PURPOSE:**

Does lumbar fusion lead to accelerated adjacent segment disc degeneration (ASDD) or is it explained by genetics and aging? The influence of genetics on ASDD remains to be explored. This study assesses whether the disc space height adjacent to a fused segment is associated with candidate gene single nucleotide polymorphisms (SNPs).

**METHODS:**

Patients with low back pain from four RCTs (N = 208 fusion; 77 non-operative treatment) underwent standing plain radiography and genetic analyses at 13 ± 4 years follow-up. Disc space height was measured using a validated computer-assisted distortion-compensated roentgen analysis technique and reported in standard deviations from normal values. Genetic association analyses included 34 SNPs in 25 structural, inflammatory, matrix degrading, apoptotic, vitamin D receptor and OA-related genes relevant to disc degeneration. These were analysed for their association with disc space height (after adjusting for age, gender, smoking, duration of follow-up and treatment group) first, separately, and then together in a stepwise multivariable model.

**RESULTS:**

Two SNPs from the IL18RAP gene (rs1420106 and rs917997) were each associated with a lower disc space height at the adjacent level (B = -0.34, p = 0.04 and B = -0.35, p = 0.04, respectively) and the MMP-9 gene SNP rs20544 was associated with a greater disc space height (B = 0.35, p = 0.04). Age (p < 0.001) and fusion (p < 0.008) were also significant variables in each analysis. The total explained variance in disc space height was for each SNP model 13-14 %, with 11-12 % of this being accounted for by the given SNP, 64-67 % by age and 19-22 % by fusion. In the multivariable regression analysis (with nine SNPs selected for entry, along with the covariates) the total explained variance in disc space height was 23 %, with the nine SNPs, age and fusion accounting for 45, 45 and 7 % of this, respectively.

**CONCLUSIONS:**

Age was the most significant determinant of adjacent segment disc space height followed by genetic factors, specifically inflammatory genes. Fusion explained a statistically significant but small proportion of the total variance. Much of the variance remained to be explained.

PMID:26281980

### 3. DISC

#### Inflammatory mechanisms

Spine (Phila Pa 1976). 2015 Aug 15;40(16):1261-9. doi: 10.1097/BRS.0000000000000954.

#### Substance P Receptor Antagonist Suppresses Inflammatory Cytokine Expression in Human Disc Cells.

Kepler CK<sup>1</sup>, Markova DZ, Koerner JD, Mendelis J, Chen CM, Vaccaro AR, Risbud MV, Albert TJ, Anderson DG.

Author information

Abstract

**STUDY DESIGN:** Laboratory study.

**OBJECTIVE:** To evaluate whether blockade of the Substance P (SP) NK1R attenuates its proinflammatory effect on human intervertebral disc cells (IVD), and to evaluate the signaling pathways associated with SP.

**SUMMARY OF BACKGROUND DATA:** SP and its receptors are expressed in human IVD cells, and cause upregulation of inflammatory mediators; however, the effects of blocking these receptors have not been studied in human IVD cells.

**METHODS:** Human annulus fibrosus (AF) and nucleus pulposus (NP) cells were expanded in monolayer, and then suspended in alginate beads. The alginate beads were treated with culture medium first containing a high affinity NK1R antagonist (L-760735) at different concentrations, and then with medium containing both NK1R antagonist and SP at 2 concentrations. Ribonucleic acid was isolated and transcribed into cDNA. Quantitative reverse transcriptase-polymerase chain reaction (RT-PCR) was performed to evaluate expression of interleukin (IL)-1 $\beta$ , IL-6, and IL-8. Western blot analysis was performed to examine levels of the phosphorylated p38 mitogen-activated protein kinase (MAPK), extracellular signal regulated kinase 1/2 (ERK1/2) and nuclear factor kappa-light-chain-enhancer of activated B cells (NF $\kappa$ B p65). The cells were pretreated with specific inhibitors of p38 (SB203580), ERK1/2 (PD98059), and p65 (SM7368) and then stimulated with SP.

**RESULTS:** We detected expression of NK1R, neurokinin receptor 2 (NK2R), and neurokinin receptor 3 (NK3R) in AF and NP cells. Treatment of disc cells with the NK1R antagonist was able to suppress expression of IL-1 $\beta$ , IL-6, and IL-8 in a dose-dependent manner. SP stimulation increased phosphorylation of p38-MAPK and ERK1/2, but not of NF $\kappa$ B p65. This indicates that p38-MAPK and ERK1/2 control SP-induced cytokine expression independently from NF- $\kappa$ B p65. Inhibition of p38 and ERK1/2 activation reduced SP-induced IL-6 production in human disc cells.

**CONCLUSION:** NK1R is responsible for the proinflammatory effect of SP on IVD cells and this effect can be blocked by preventing binding of SP to NK1R. This study shows for the first time that SP mediates signaling in disc cells through NK1R and that SP activates the proinflammatory p38-MAPK and ERK1/2 pathways.

LEVEL OF EVIDENCE: 4.

PMID: 25929203

## 5. SURGERY

### Reoperation rates 15%

J Bone Joint Surg Am. 2015 Aug 19;97(16):1316-25. doi: 10.2106/JBJS.N.01287.

#### **Risk Factors for Reoperation in Patients Treated Surgically for Intervertebral Disc Herniation: A Subanalysis of Eight-Year SPORT Data.**

Leven D<sup>1</sup>, Passias PG<sup>1</sup>, Errico TJ<sup>1</sup>, Lafage V<sup>1</sup>, Bianco K<sup>1</sup>, Lee A<sup>1</sup>, Lurie JD<sup>2</sup>, Tosteson TD<sup>2</sup>, Zhao W<sup>2</sup>, Spratt KF<sup>2</sup>, Morgan TS<sup>2</sup>, Gerling MC<sup>1</sup>.

Author information

Abstract

#### **BACKGROUND:**

Lumbar discectomy and laminectomy in patients with intervertebral disc herniation (IDH) is common, with variable reported reoperation rates. Our study examined which baseline characteristics might be risk factors for reoperation and compared outcomes between patients who underwent reoperation and those who did not.

#### **METHODS:**

We performed a retrospective subgroup analysis of patients from the IDH arm of the Spine Patient Outcomes Research Trial (SPORT) randomized and observational cohorts. We analyzed baseline characteristics and outcomes of patients who underwent reoperation and those who did not with use of data collected from enrollment through eight-years of follow-up after surgery. Follow-up times were measured from the time of surgery, and baseline covariates were updated to the follow-up immediately preceding the time of surgery for outcomes analyses.

#### **RESULTS:**

At eight years, the reoperation rate was 15% (691 no reoperation; 119 reoperation). Sixty-two percent of these patients underwent reoperation because of a recurrent disc herniation; 25%, because of a complication or other factor; and 11%, because of a new condition. The proportion of reoperations that were performed for a recurrent disc herniation ranged from 58% to 62% in the individual years. Older patients were less likely to have reoperation ( $p = 0.015$ ), as were patients presenting with asymmetric motor weakness at baseline ( $p = 0.0003$ ). Smoking, diabetes, obesity, Workers' Compensation, and clinical depression were not associated with a greater risk of reoperation. Scores on the Short Form (SF)-36 for bodily pain and physical functioning, the Oswestry Disability Index (ODI), and the Sciatica Bothersomeness Index as well as satisfaction with symptoms had improved less at the time of follow-up in the reoperation group ( $p < 0.001$ ).

#### **CONCLUSIONS:**

In patients who underwent surgery for IDH, the overall reoperation rate was 15% at the eight-year follow-up. Patients of older age and patients presenting with asymmetric motor weakness were less likely to undergo a reoperation. Less improvement in patient-reported outcomes was noted in the reoperation group.

**LEVEL OF EVIDENCE:** Prognostic Level III. See Instructions for Authors for a complete description of levels of evidence.

PMID:26290082

**Workability following surgery in workmans comp cases**

Spine (Phila Pa 1976). 2015 Aug 15;40(16):1270-6. doi: 10.1097/BRS.0000000000001010.

**Factors Associated With Work Ability in Patients Undergoing Surgery for Cervical Radiculopathy.**

Ng E<sup>1</sup>, Johnston V, Wibault J, Löfgren H, Dederling Å, Öberg B, Zsigmond P, Peolsson A.  
Author information

Abstract

**STUDY DESIGN:**

Cross-sectional study.

**OBJECTIVE:**

To investigate the factors associated with work ability in patients undergoing surgery for cervical radiculopathy.

**SUMMARY OF BACKGROUND DATA:**

Surgery is a common treatment of cervical radiculopathy in people of working age. However, few studies have investigated the impact on the work ability of these patients.

**METHODS:**

Patients undergoing surgery for cervical radiculopathy (n = 201) were recruited from spine centers in Sweden to complete a battery of questionnaires and physical measures the day before surgery. The associations between various individual, psychological, and work-related factors and self-reported work ability were investigated by Spearman rank correlation coefficient, multivariate linear regression, and forward stepwise regression analyses. Factors that were significant (P < 0.05) in each statistical analysis were entered into the successive analysis to reveal the factors most related to work ability. Work ability was assessed using the Work Ability Index.

**RESULTS:**

The mean Work Ability Index score was 28 (SD, 9.0). The forward stepwise regression analysis revealed 6 factors significantly associated with work ability, which explained 62% of the variance in the Work Ability Index. Factors highly correlated with greater work ability included greater self-efficacy in performing self-cares, lower physical load on the neck at work, greater self-reported chance of being able to work in 6 months' time, greater use of active coping strategies, lower frequency of hand weakness, and higher health-related quality of life.

**CONCLUSION:**

Psychological, work-related and individual factors were significantly associated with work ability in patients undergoing surgery for cervical radiculopathy. High self-efficacy was most associated with greater work ability. Consideration of these factors by surgeons preoperatively may provide optimal return to work outcomes after surgery.

**LEVEL OF EVIDENCE:**

3.

PMID:26076434

**Predictors of fusion outcomes in elderly**

HSS Journal ® August 2015 Date: 05 Aug 2015

**Older Age and Leg Pain Are Good Predictors of Pain and Disability Outcomes in 2710 Patients Who Receive Lumbar Fusion****Background**

Identifying appropriate candidates for lumbar spine fusion is a challenging and controversial topic. The purpose of this study was to identify baseline characteristics related to poor/favorable outcomes at 1 year for a patient who received lumbar spine fusion.

**Questions/Purposes**

The aims of this study were to describe baseline characteristics of those who received lumbar surgery and to identify baseline characteristics from a spine repository that were related to poor and favorable pain and disability outcomes for patient who received lumbar fusion (with or without decompression), who were followed up for 1 full year and discriminate predictor variables that were either or in contrast to prognostic variables reported in the literature.

**Methods**

This study analyzed data from 2710 patients who underwent lumbar spine fusion. All patient data was part of a multicenter, multi-national spine repository. Ten relatively commonly captured data variables were used as predictors for the study. Univariate/multivariate logistic regression analyses were run against outcome variables of pain/disability.

**Results**

Multiple univariate findings were associated with pain/disability outcomes at 1 year including age, previous surgical history, baseline disability, baseline pain, baseline quality of life scores, and leg pain greater than back pain. Notably significant multivariate findings for both pain and disability include older age, previous surgical history, and baseline mental summary scores, disability, and pain.

**Conclusion**

Leg pain greater than back pain and older age may yield promising value when predicting positive outcomes. Other significant findings may yield less value since these findings are similar to those that are considered to be prognostic regardless of intervention type.

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Caesarean section and pain

J Pain. 2015 Aug 20. pii: S1526-5900(15)00815-9. doi: 10.1016/j.jpain.2015.08.001.

#### **The role of psychological factors in persistent pain after caesarean section.**

Richez B<sup>1</sup>, Ouchchane L<sup>2</sup>, Guttmann A<sup>2</sup>, Mirault F<sup>3</sup>, Bonnin M<sup>4</sup>, Noudem Y<sup>5</sup>, Cognet V<sup>6</sup>, Dalmas AF<sup>7</sup>, Brisebrat L<sup>8</sup>, Andant N<sup>9</sup>, Soule-Sonneville S<sup>9</sup>, Dubray C<sup>10</sup>, Dualé C<sup>11</sup>, Schoeffler P<sup>12</sup>.

Author information

#### Abstract

This French multicentric prospective cohort study recruited 391 patients to investigate the risk factors for persistent pain after elective caesarean section, focusing on psychosocial aspects as adjusted to other known medical factors. Perioperative data was collected and specialised questionnaires were completed to assess the report of pain at the site of surgery. Three dependent outcomes were considered: pain at the 3<sup>rd</sup> month after surgery (M3, n = 268; risk = 28%), pain at the 6<sup>th</sup> month after surgery (M6, n = 239; risk = 19%), and the cumulative incidence (up to M6) of neuropathic pain, as assessed using the DN4 (n = 218; risk = 24.5%). The neuropathic aspect of reported pain changed over time in more than 60% of cases, pain being more intense if associated with neuropathic features. Whatever the dependent outcome, a high mental component of quality-of-life (SF-36) was protective. Pain at M3 was also predicted by pain reported during current pregnancy and a history of miscarriage. Pain at M6 was also predicted by report of a postoperative complication. Incident neuropathic pain was predicted by pain reported during current pregnancy, a previous history of peripheral neuropathic event, and preoperative anxiety.

#### **TRIAL REGISTRATION:**

ClinicalTrials.gov, NCT00812734.

#### **PERSPECTIVE:**

Persistent pain after caesarean section displays a relatively frequent neuropathic aspect but this is less stable than that following other surgeries. Also, when comparing the risk factor analyses to published data for hysterectomy, the influence of preoperative psychological factors seems less important, possibly because of the different context and environment.

**KEYWORDS:** DN4; caesarean section; chronic pain; neuropathic pain; postsurgical pain

PMID: 26299436

**Prostrate and BMI**

Urol Oncol. 2015 Aug 13. pii: S1078-1439(15)00349-X. doi: 10.1016/j.urolonc.2015.07.006.

**Waist circumference, waist-hip ratio, body mass index, and prostate cancer risk: Results from the North-American case-control study Prostate Cancer & Environment Study.**

Boehm K<sup>1</sup>, Sun M<sup>2</sup>, Larcher A<sup>3</sup>, Blanc-Lapierre A<sup>4</sup>, Schiffmann J<sup>5</sup>, Graefen M<sup>5</sup>, Sosa J<sup>5</sup>, Saad F<sup>6</sup>, Parent M<sup>7</sup>, Karakiewicz PI<sup>8</sup>.

Author information

Abstract

**INTRODUCTION:**

The evidence on the association between anthropometric measures quantifying body fatness and prostate cancer (PCa) risk is not entirely consistent. Associations among waist circumference (WC), waist-hip ratio, body mass index (BMI), and PCa risk were assessed in a population-based case-control study.

**PATIENTS AND METHODS:**

The study included 1933 incident PCa cases diagnosed between 2005 and 2009. Population controls were 1994 age-matched ( $\pm 5$ y) Montreal residents selected from electoral lists. Information on sociodemographics, medical history including PCa screening, height, weight, and waist and hip circumferences was collected through interviews. Logistic regression was used to assess odds ratios (ORs) for the association between anthropometric measures, and overall and grade-specific PCa.

**RESULTS:**

After adjustment for BMI, an excess risk of high-grade PCa (Gleason $\geq 7$ ) was associated with a WC  $\geq 102$ cm (OR = 1.47 [1.22-1.78]) and with a waist-hip ratio  $> 1.0$  (OR = 1.20 [1.01-1.43]). Men with a BMI  $\geq 30$ kg/m<sup>2</sup> had a lower risk of PCa, regardless of grade. Restricting to subjects recently screened for PCa did not alter findings.

**CONCLUSION:**

Elevated BMI was associated with a lower risk of PCa, regardless of grade. Contrastingly, abdominal obesity, when adjusted for BMI, yielded results in the opposite direction. Taken together, our observations suggest that the specific body fat distribution (abdominal), for a given BMI, is a predictor of PCa risk, whereas BMI alone is not. BMI and abdominal obesity, especially when measured by the WC, should be examined conjointly in future studies on this issue and may require consideration at patient counseling.

**KEYWORDS:** Abdominal fat; Body mass index; Case-control study; Obesity; Prostate cancer; Waist circumference; Waist-hip ratio  
PMID: 26278366

**Pelvic floor pain**

Am J Obstet Gynecol. 2015 Aug 20. pii: S0002-9378(15)00908-4. doi: 10.1016/j.ajog.2015.08.038.

**Multimodal nociceptive mechanisms underlying chronic pelvic pain.**

Hellman KM<sup>1</sup>, Patanwala IY<sup>2</sup>, Pozolo KE<sup>3</sup>, Tu FF<sup>4</sup>.  
Author information

Abstract

**OBJECTIVE:**

To evaluate candidate mechanisms underlying the pelvic floor dysfunction in women with chronic pelvic pain and/or painful bladder syndrome/interstitial cystitis. Notably, prior studies have not consistently controlled for potential confounding by psychological or anatomical factors.

**STUDY DESIGN:**

As part of a larger study on pelvic floor pain dysfunction and bladder pain sensitivity, we compared a measure of mechanical pain sensitivity, pressure pain thresholds, between women with pelvic pain and pain-free controls. We also assessed a novel pain measure using degree and duration of post-exam pain aftersensation, and conducted structural and functional assessments of the pelvic floor to account for any potential confounding. Phenotypic specificity of pelvic floor measures was assessed with receiver-operator characteristic curves adjusted for prevalence.

**RESULTS:**

A total of 23 women with chronic pelvic pain, 23 painful bladder syndrome, and 42 pain-free controls completed the study. Women with chronic pelvic pain or painful bladder syndrome exhibited enhanced pain sensitivity with lower pressure pain thresholds (1.18 [interquartile range: 0.87-1.41] kg/cm<sup>2</sup>) than pain-free participants (1.48 [1.11-1.76] kg/cm<sup>2</sup>; p<0.001) and prolonged pain aftersensation (3.5 [0-9] vs 0 [0-1] minutes; p<0.001). Although genital hiatus (p<0.01) was wider in women with chronic pelvic pain there were no consistently observed group differences in pelvic floor anatomy, muscle tone or strength. The combination of pressure pain thresholds and aftersensation duration correlated with severity of pelvic floor tenderness (R<sup>2</sup> =41-51, p's< 0.01). Even after adjustment for prevalence, the combined metrics discriminated pain-free controls from women with chronic pelvic pain or painful bladder syndrome (area under the curve=0.87).

**CONCLUSION:**

Both experimental assessment of pelvic floor pain thresholds and measurement of sustained pain are independently associated with pelvic pain phenotypes. These findings suggest systematic clinical assessment of the time course of provoked pain symptoms, which occurs over seconds for mechanical pain thresholds vs. minutes for aftersensation pain, would be helpful in identifying the fundamental mechanisms of pelvic floor pain. Longitudinal studies of therapies differentially targeting these discrete mechanisms are needed to confirm their clinical significance.

**KEYWORDS:** Painful Bladder Syndrome; Pelvic Pain; Pressure Pain Threshold; Quantitative Sensory Testing  
PMID: 26299416

**Foot reflexology and delivery**

Acta Med Iran 2015. 53(8):507-511.

**The Effect of Foot Reflexology on Anxiety, Pain, and Outcomes of the Labor in Primigravida Women**

Soheila Moghimi Hanjani, Zahra Mehdizadeh Tourzani, Mahnaz Shoghi

## ABSTRACT

Reflexology is a technique used widely as one of non-pharmacological pain management techniques. The present study aimed to review and determine the effect of foot reflexology on anxiety, pain and outcomes of the labor in primigravida women. This clinical trial study was conducted on 80 primigravida mothers who were divided randomly into an intervention group (Foot reflexology applied for 40 min, n=40) and control group (n=40). The pain intensity was scored immediately after the end of intervention and at 30, 60 and 120 min after the intervention in both groups, based on McGill Questionnaire for Pain Rating Index (PRI). Spielberger State-Trait Anxiety Inventory (STAI) was completed before and after intervention in both groups. Duration of labor phases, the type of labor and Apgar scores of the infant at the first and fifth minute were recorded in both groups. Descriptive and inferential statistics methods (t-test and chi-square test) were applied in analyzing data. Application of reflexology technique decreased pain intensity (at 30, 60 and 120 min after intervention) and duration of labor as well as anxiety level significantly ( $P<0.001$ ). Furthermore, a significant difference was observed between two groups in terms of the frequency distribution of the type of labor and Apgar score ( $P<0.001$ ).

Results of this study show that reflexology reduces labor pain intensity, duration of labor, anxiety, frequency distribution of natural delivery and increases Apgar scores. Using this non-invasive technique, obstetricians can achieve, to some extent, to one of the most important goals of midwifery as pain relief and reducing anxiety during labor and encourage the mothers to have a vaginal delivery.

**KEYWORDS** Pain relief; Reflexology; Anxiety; Labor pain; Duration of labor; Apgar; Primiparous

**Acupuncture and dysmenorrhea****Efficacy of acupuncture versus combined oral contraceptive pill in treatment of moderate-to-severe dysmenorrhea: A randomized controlled trial**

Evidence-based Complementary and Alternative Medicine , 08/21/2015 Sriprasert I, et al.

**T**his open-label randomized controlled trial was designed to compare the efficacy of acupuncture and combined oral contraceptive (COC) pill in treating moderate-to-severe primary dysmenorrhea. Acupuncture is an alternative option for relieving dysmenorrhea, especially when COC is not a favorable choice.

- Fifty-two participants were randomly assigned to receive either acupuncture (n = 27) or COC (n = 25) for three menstrual cycles.
- Mefenamic acid was prescribed as a rescue analgesic drug with both groups.
- The statistical approach used for efficacy and safety assessments was intention-to-treat analysis.
- By the end of the study, both treatments had resulted in significant improvement over baselines in all outcomes, that is, maximal dysmenorrhea pain scores, days suffering from dysmenorrhea, amount of rescue analgesic used, and quality of life assessed by SF-36 questionnaire.
- Over the three treatment cycles, COC caused greater reduction in maximal pain scores than acupuncture, while improvements in the remaining outcomes were comparable.
- Responders were defined as participants whose maximal dysmenorrhea pain scores decreased at least 33% below their baseline.
- Response rates following both interventions at the end of the study were not statistically different.
- Acupuncture commonly caused minimal local side effects but did not cause any hormone-related side effects as did COC

## 8. VISCERA

### Probiotics and IBS

Curr Opin Clin Nutr Metab Care. 2015 Sep;18(5):485-9. doi: 10.1097/MCO.0000000000000199.

#### **Symbiotics in irritable bowel syndrome - better than probiotics alone?**

Gracie DJ<sup>1</sup>, Ford AC.

Author information

Abstract

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

Irritable bowel syndrome (IBS) is a chronic gastrointestinal disorder associated with significant physical and psychological comorbidity. The etiology of the condition is uncertain but recent research suggests that the gut bacterial composition may play a role in its development. Therefore, manipulation of the intestinal microbiome by using probiotics and symbiotics has the potential to improve patient outcomes in IBS.

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

Numerous randomized controlled trials suggest a benefit of probiotics in the management of IBS, with a significant reduction in the likelihood of symptoms persisting after therapy, and improvements in abdominal pain, bloating and flatulence when probiotics are compared with placebo. Evidence for the effect of probiotics on quality of life is conflicting. Relatively few randomized controlled trials have examined the effect of symbiotics on outcomes in IBS, but results thus far are promising.

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

Probiotics appear to be beneficial in IBS. Data supporting the use of symbiotics is sparse. Whether symbiotics are superior to probiotics is unclear.

PMID:26107141

**Antibiotics and GI problems**

Neurogastroenterol Motil. 2015 Aug 24. doi: 10.1111/nmo.12655.

**Non-enteric infections, antibiotic use, and risk of development of functional gastrointestinal disorders.**

Paula H<sup>1</sup>, Grover M<sup>2</sup>, Halder SL<sup>3</sup>, Locke GR 3rd<sup>2</sup>, Schleck CD<sup>4</sup>, Zinsmeister AR<sup>4</sup>, Talley NJ<sup>2,5</sup>.  
Author information

## Abstract

**BACKGROUND:**

Gastrointestinal infections are risk factors for irritable bowel syndrome (IBS) and functional dyspepsia (FD). We investigated whether non-enteric infections and antibiotic exposure are also associated with the development of functional gastrointestinal disorders (FGIDs).

**METHODS:**

In a nested case-control study, random samples of Olmsted County, MN, were mailed valid self-report questionnaires from 1988 through 1994, and then follow-up questionnaires from 1995 through 2003. Survey responders who did not report any FGID symptoms at baseline, but then reported such symptoms in at least one subsequent survey, were classified as new-onset cases. Age-matched controls were individuals who did not have symptoms at either the initial or subsequent surveys.

**KEY RESULTS:**

The overall response rate was 78% to the initial survey and 52% to the follow-up survey. Based on the responses, 316 participants had a new onset of an FGID (43 IBS constipation, 95 IBS diarrhea, 25 IBS mixed, and 153 other FGIDs, including FD) and 250 did not (controls). Around 76% (241/316) of cases reported a non-enteric infection vs 66% (166/250) of the controls. The frequency of enteric infections was similar between the two groups. Of the new FGID cases, 83% had a non-enteric infection that was treated with antibiotic. In a logistic regression model, treatment with antibiotics for a non-gastrointestinal infection was associated with the development of an FGID (odds ratio = 1.90; 95% CI: 1.21-2.98; p = 0.005), after adjusting for age and sex.

**CONCLUSIONS & INFERENCES:**

Based on a case-control study, treatment of a non-gastrointestinal infection with antibiotics appears to be a risk factor for development of an FGID.

**KEYWORDS:** antibiotics; functional GI disorders; irritable bowel syndrome; non-enteric infections

PMID: 26303310

**GERD in children/Milk!!**

Pediatr Int. 2015 Aug 8. doi: 10.1111/ped.12779.

**Food allergy among children with refractory gastroesophageal reflux disease.**

Yukselen A<sup>1</sup>, Celtik C<sup>2</sup>.  
Author information

Abstract

**BACKGROUND:**

Gastroesophageal reflux disease (GERD) and food allergy are frequent disorders of childhood. The purpose of this study was to determine the frequency of food allergy in children with refractory GERD.

**METHODS:**

151 children resistant to pharmacologic treatment of GERD were underwent diagnostic procedures as skin prick test (SPT), specific immunoglobulin E (sIgE), eosinophil count, atopy patch test (APT), oral food challenge and then divided into three groups according to the results of oral milk -challenge and allergy work-up: Group A1 - children with positive results for both oral milk challenges and IgE-mediated allergy tests; Group A2- children with positive milk challenges but negative IgE-mediated allergy tests; Group B - children with negative results for both oral milk challenges and allergy tests.

**RESULTS:**

There were 35, 30 and 86 patients in Group A1, Group A2 and Group B, respectively. 28 of 35 patients in Group A1 had cow's milk allergy and the other seven patients had egg allergy. APT positivity was more common in patients belonging to Group A2. Endoscopic esophagitis was observed in 6 patients of Group A1 and in 4 patients of Group A2. Bloody stools, atopic dermatitis and recurrent wheezing episodes are significantly more common in Group A1 than Group A2 and Group B ( $p < 0.001$ , for both).

**CONCLUSION:**

Cow's milk allergy was observed frequently in children with resistant to pharmacologic treatment of GERD. Combined skin prick and specific IgE tests, atopy patch test and oral food challenge is essential for avoidance of unnecessary elimination diet. This article is protected by copyright. All rights reserved.

**KEYWORDS:** children; food allergy; gastroesophageal reflux disease  
PMID: 26257132

**Sleep apnea**

Int J Rheum Dis. 2015 Aug 10. doi: 10.1111/1756-185X.12629.

**Evaluation of pain sensitivity by tender point counts and myalgic score in patients with and without obstructive sleep apnea syndrome.**

Terzi R<sup>1</sup>, Yılmaz Z<sup>2</sup>.

Author information

**Abstract**

**AIM:** The purpose of this study was to assess the difference between patients with and without obstructive sleep apnea syndrome (OSAS) with respect to pain sensitivity.

**METHOD:**

The study was conducted on 31 women diagnosed with OSAS and 31 healthy women. All patients underwent polysomnographic testing. A pressure algometer (dolorimeter) was used to measure the pressure pain threshold. Fibromyalgia was diagnosed based on the 1990 American College of Rheumatology diagnosis criteria.

**RESULTS:**

The myalgic score was  $73.95 \pm 18.09$  in patients with OSAS, while this value was  $84.18 \pm 24.31$  in the control group. The difference between the groups was statistically significant ( $P = 0.041$ ). The number of tender points was  $8.19 \pm 3.35$  in the patient group with OSAS, while this number was  $6.35 \pm 2.23$  in the control group. The difference between the two groups was statistically significant ( $P = 0.014$ ). No statistically significant differences were found between age, body mass index, Beck depression scores, control point score and the presence of fibromyalgia, between the two groups ( $P > 0.05$ ). A statistically significant positive correlation was found between the myalgic scores and mean saturation O<sub>2</sub> (%) values of the patients ( $r = 0.357$ ;  $P = 0.049$ ).

**CONCLUSION:**

The differences noted between OSAS patients and the control group with respect to myalgic score and the number of tender points suggest that there might be a relation between OSAS and pain sensitivity. There might be an association between low oxygen saturation and total myalgic score.

**KEYWORDS:** fibromyalgia; obstructive sleep apnea; pain; pressure pain threshold; women  
PMID: 26258423

IBS

J Clin Nurs. 2015 Aug 12. doi: 10.1111/jocn.12851.

**Structure and content components of self-management interventions that improve health-related quality of life in people with inflammatory bowel disease: a systematic review, meta-analysis and meta-regression.**

Tu W<sup>1</sup>, Xu G<sup>1</sup>, Du S<sup>1</sup>.

Author information

Abstract

**AIMS AND OBJECTIVES:** The purpose of this review was to identify and categorise the components of the content and structure of effective self-management interventions for patients with inflammatory bowel disease.

**BACKGROUND:** Inflammatory bowel diseases are chronic gastrointestinal disorders impacting health-related quality of life. Although the efficacy of self-management interventions has been demonstrated in previous studies, the most effective components of the content and structure of these interventions remain unknown.

**DESIGN:** A systematic review, meta-analysis and meta-regression of randomised controlled trials was used.

**METHODS:** A systematic search of six electronic databases, including Pubmed, Embase, Cochrane central register of controlled trials, Web of Science, Cumulative Index of Nursing and Allied Health Literature and Chinese Biomedical Literature Database, was conducted. Content analysis was used to categorise the components of the content and structure of effective self-management interventions for inflammatory bowel disease. Clinically important and statistically significant beneficial effects on health-related quality of life were explored, by comparing the association between effect sizes and various components of self-management interventions such as the presence or absence of specific content and different delivery methods.

**RESULTS:** Fifteen randomised controlled trials were included in this review. Distance or remote self-management interventions demonstrated a larger effect size. However, there is no evidence for a positive effect associated with specific content component of self-management interventions in adult patients with inflammatory bowel disease in general.

**CONCLUSIONS:** The results showed that self-management interventions have positive effects on health-related quality of life in patients with inflammatory bowel disease, and distance or remote self-management programmes had better outcomes than other types of interventions.

**RELEVANCE TO CLINICAL PRACTICE:** This review provides useful information to clinician and researchers when determining components of effective self-management programmes for patients with inflammatory bowel disease. More high-quality randomised controlled trials are needed to test the results.

**KEYWORDS:** inflammatory bowel disease; meta-analysis; meta-regression; quality of life; self-management; systematic review

PMID: 26265325

**10 A. CERVICAL SPINE****Pilates vs yoga for neck pain****Comparative effectiveness of Pilates and yoga group exercise interventions for chronic mechanical neck pain: Quasi-randomised parallel controlled study**

Physiotherapy, 08/25/2015 Dunleavy K, et al.

The aim of this study is to determine the effectiveness of Pilates and yoga group exercise interventions for individuals with chronic neck pain (CNP). Pilates and yoga group exercise interventions with appropriate modifications and supervision were safe and equally effective for decreasing disability and pain compared with the control group for individuals with mild-to-moderate CNP. Physiotherapists may consider including these approaches in a plan of care.

**Methods**

- Quasi-randomised parallel controlled study.
- Community, university and private practice settings in four locations.
- Fifty-six individuals with CNP scoring  $\geq 3/10$  on the numeric pain rating scale for  $>3$  months (controls  $n = 19$ , Pilates  $n = 20$ , yoga  $n = 19$ ).
- Exercise participants completed 12 small-group sessions with modifications and progressions supervised by a physiotherapist.
- Main outcome measures:
- The primary outcome measure was the Neck Disability Index (NDI).
- Secondary outcomes were pain ratings, range of movement and postural measurements collected at baseline, 6 weeks and 12 weeks.
- Follow-up was performed 6 weeks after completion of the exercise classes (Week 18).

**Results**

- NDI decreased significantly in the Pilates {baseline: 11.1 [standard deviation (SD) 4.3] vs Week 12: 6.8 (SD 4.3); mean difference  $-4.3$  (95% confidence interval  $-1.64$  to  $-6.7$ );  $P < 0.001$ } and yoga groups [baseline: 12.8 (SD 7.4) vs Week 12: 8.1 (SD 5.6); mean difference  $-4.7$  (95% confidence interval  $-2.1$  to  $-7.4$ );  $P < 0.00$ ], with no change in the control group.
- Pain ratings also improved significantly.
- Moderate-to-large effect sizes (0.7 to 1.8) and low numbers needed to treat were found.
- There were no differences in outcomes between the exercise groups or associated adverse effects.
- No improvements in range of movement or posture were found.

**12 B. CERVICAL SURGERIES****Fusions and disc replacements**

Spine (Phila Pa 1976). 2015 Aug 15;40(16):1277-83. doi: 10.1097/BRS.0000000000000957.

**A Comparison of Anterior Cervical Corpectomy and Fusion Combined With Artificial Disc Replacement and Cage Fusion in Patients With Multilevel Cervical Spondylotic Myelopathy.**

Mao N<sup>1</sup>, Wu J, Zhang Y, Gu X, Wu Y, Lu C, Ding M, Lv R, Li M, Shi Z.

Author information

Abstract

**STUDY DESIGN:**

A retrospective study.

**OBJECTIVE:**

The aim of this study was to compare clinical and radiological outcomes of anterior cervical corpectomy and fusion (ACCF) combined with artificial disc replacement (C-ADR) and ACCF combined with anterior cervical discectomy and fusion (ACDF) in patients with consecutive 3-level cervical spondylotic myelopathy (CSM).

**SUMMARY OF BACKGROUND DATA:**

The optimal surgical strategy for multilevel CSM (MCSM) remains undefined. C-ADR maintains motion at the level of the surgical procedure and decreases strain on the adjacent segments. The clinical results of multilevel C-ADR have not yet been elucidated. ACCF combined with 1-level C-ADR for the treatment of consecutive 3-level CSM may be a reasonable alternative to 3-level fusion.

**METHODS:**

We retrospectively reviewed the histories of patients who underwent surgery for consecutive 3-level CSM between C3-4 and C6-7 from June 2007 to August 2011. A total of 42 patients were divided into 2 groups. Group A (n = 19) underwent ACCF combined with 1-level C-ADR; group B (n = 23) underwent ACCF combined with 1-level ACDF. We compared perioperative parameters, clinical parameters, and radiological parameters.

**RESULTS:**

There were no significant differences in the average age, sex ratio, the preoperative heights of the disc space or average blood loss between the 2 groups. Group A had longer operation times than group B (P < 0.05). During the follow-up period, group A showed a better Neck Dysfunction Index recovery (P < 0.05) at 24 months postoperatively, and less visual analogue scale scores at 12 and 24 months postoperatively (P < 0.05 and P < 0.001, respectively). Moreover, group A exhibited better C2-C7 range of motion recovery at 6, 12, and 24 months postoperatively (P < 0.05, respectively).

**CONCLUSION:**

Group A was superior to Group B in terms of better Neck Dysfunction Index recovery, less intermediate term pain, and better C2-C7 ROM recovery. ACCF hybrid 1-level C-ADR may be a suitable choice for the management of 3-level CSM in appropriate patients.

**LEVEL OF EVIDENCE: 3.**

PMID: 25929206

### 13. CRANIUM/TMJ

#### TMJ problems through a lifetime

Eur J Pain. 2015 Aug 27. doi: 10.1002/ejp.755.

#### **Temporomandibular pain and jaw dysfunction at different ages covering the lifespan - A population based study.**

Lövgren A<sup>1</sup>, Häggman-Henrikson B<sup>1,2</sup>, Visscher CM<sup>3</sup>, Lobbezoo F<sup>3</sup>, Marklund S<sup>1</sup>, Wänman A<sup>1</sup>.  
Author information

Abstract

#### **BACKGROUND:**

Temporomandibular pain and jaw dysfunction can have a negative effect on daily life, but these conditions are not well recognized in the health care systems. The general aim was to examine the cross-sectional prevalence of frequent temporomandibular pain and jaw dysfunction in men and women across the lifespan.

#### **METHODS:**

The analysis was based on data from 137,718 individuals (mean age 35 years, SD 22.7) who answered three questions (3Q/TMD) included in the digital health declaration in the Public Dental Health care in the county of Västerbotten, Sweden; Q1: 'Do you have pain in your temple, face, jaw or jaw joint once a week or more?'; Q2: 'Does it hurt once a week or more when you open your mouth or chew?'; and Q3: 'Does your jaw lock or become stuck once a week or more?'

#### **RESULTS:**

The prevalence of frequent temporomandibular pain (Q1) was 5.2% among women and 1.8% among men ( $p < 0.0001$ ). The prevalence of frequent pain on jaw movement (Q2) was 2.5% among women and 0.9% among men ( $p < 0.0001$ ). The prevalence of frequent locking of the jaw (Q3) was 2.7% among women and 1.2% among men ( $p < 0.0001$ ).

#### **CONCLUSIONS:**

The study shows that the cross-sectional prevalence of temporomandibular pain and jaw dysfunction varies during the lifespan. For men and women, respectively, symptoms increase during adolescence, peak in middle age and then gradually diminish. The prevalence of these symptoms is significantly higher among women except from the first and last decades of a 100-year lifespan.

PMID: 26311138

## Removal devices effectiveness

Eur J Orthod. 2015 Aug;37(4):418-34. doi: 10.1093/ejo/cju071. Epub 2014 Nov 13.

**Treatment effects of removable functional appliances in patients with Class II malocclusion: a systematic review and meta-analysis.**

Koretsi V<sup>1</sup>, Zymperdikas VF<sup>2</sup>, Papageorgiou SN<sup>3</sup>, Papadopoulos MA<sup>4</sup>.  
Author information

## Abstract

**OBJECTIVE:**

To assess the treatment effects of removable functional appliances (RFAs) in treated versus untreated patients with Class II malocclusion by means of lateral cephalometric radiographs.

**SEARCH METHODS:**

Unrestricted electronic search of 18 databases and manual searches up to October 2013.

**SELECTION CRITERIA:**

Prospective randomized and non-randomized controlled trials reporting on cephalometric angular measurements of Class II patients treated with RFAs and their matched controls.

**DATA COLLECTION AND ANALYSIS:**

Skeletal, dental, and soft tissue changes were annualized and stratified to short- and long-term effects. Methodological limitations were evaluated with the Cochrane Risk of Bias tool and the Downs and Black checklist. Mean differences (MDs) with their 95% confidence intervals (CIs) were calculated from random-effects meta-analyses. Patient- or appliance-related subgroup analyses and sensitivity analyses were performed with mixed-effects models.

**RESULTS:**

Seventeen studies were included (1031 patients; mean age: 10.6 years), with most of them originating from university clinics and reporting short-term effects (directly after the removal of RFAs). Treatment was associated with minimal reduction of SNA angle (11 studies, MD = -0.28 degree/year, 95% CI: -0.44 to -0.12 degree/year), minimal increase of SNB angle (11 studies, MD = 0.62 degree/year, 95% CI: 0.36-0.88 degree/year), and small decrease of ANB angle (10 studies, MD = -1.14 degree/year, 95% CI: -1.52 to -0.77 degree/year) compared to untreated Class II patients. RFAs caused significant dentoalveolar changes (predominantly retroclination of the upper incisors) and significant soft tissue changes. Skeletal changes were more pronounced with the Twin Block appliance. Various patient- or appliance-related factors influenced the results of the subgroup analyses, while the sensitivity analyses indicated robustness. Existing evidence was inadequate to assess the long-term effectiveness of RFAs.

**CONCLUSIONS:**

The short-term evidence indicates that RFAs are effective in improving Class II malocclusion, although their effects are mainly dentoalveolar, rather than skeletal.

PMID: 25398303

**Malocclusion**

Eur J Orthod. 2015 Aug;37(4):412-7. doi: 10.1093/ejo/cju062. Epub 2014 Nov 11.

**Development of the curve of Spee in Class II subdivision malocclusion: a longitudinal study.**

Veli I<sup>1</sup>, Ozturk MA<sup>1</sup>, Uysal T<sup>2</sup>.  
Author information

Abstract

**OBJECTIVE:**

To compare the depth of curve of Spee (COS) in Class I and II sides of Class II subdivision malocclusion longitudinally and to describe the changes in the COS in relation to dental arch over time.

**MATERIALS AND METHOD:**

The study group comprised 17 subjects exhibiting Class II subdivision malocclusion. The depth of COS, intermolar width, distances from mesial anatomic contact points of the first permanent molars to the contact point of the central incisors in Class I and II sides and arch length in mandible were analysed on digital models in three different time points based on cervical vertebral maturation (T1; mean age: 12.4 years, T2; mean age: 15.1 years, and T3: mean age: 19.1 years). Pearson's correlation coefficients were calculated and linear multiple regression analysis with enter method was carried out.

**RESULTS:**

No significant differences were found in the depth of COS between Class I and II sides in all time periods. The mesiobuccal cusp of the first molar was the deepest part of COS in both sides and in all time periods, with a maximum depth of  $2.37 \pm 0.83$  mm in T1 and a minimum depth of  $1.91 \pm 0.66$  mm in T3. Between baseline and final follow-up; the depth of COS, arch length, and distance in Class I side decreased significantly. Arch length had a significant correlation with the depth of COS ( $r = 0.471$ ) in T3.

**CONCLUSIONS:**

As the depth of COS did not differ between either the Class II or I sides, the same mechanics can be used to level the COS in either sides of the mandibular arch.

PMID: 25389121

**Cranial vault**

Eur J Orthod. 2015 Aug;37(4):403-11. doi: 10.1093/ejo/cju066. Epub 2014 Nov 8.

**The nasomaxillary complex and the cranial base in artificial cranial deformation: relationships from a geometric morphometric study.**

Ferros I<sup>1</sup>, Mora MJ<sup>1</sup>, Obeso IF<sup>1</sup>, Jimenez P<sup>2</sup>, Martinez-Insua A<sup>3</sup>.

Author information

Abstract

**INTRODUCTION:**

It is widely accepted that there is a relationship between the cranial base and the development of the nasomaxillary complex (NMC). The objective of the present study was to investigate the morphological relationship between these two anatomical units in skulls that have intentionally been subjected to one of two types of artificial deformity of the cranial vault [artificially deformed skulls (ADS)].

**MATERIAL AND METHODS:**

A geometric morphometry study was performed on lateral cephalometric X-rays of three groups of crania: 32 with anteroposterior (AP) deformity, 17 with circumferential (C) deformity, and 39 with no apparent deformity.

**RESULTS:**

The cranial base of the ADS showed marked deformity that produced a restriction of AP growth of the NMC, alterations of the roof of the orbit as a consequence of the rotation of anterior cranial fossa, and nasal protrusion. Pronounced morphological differences were found between the three groups: increased vertical development of the maxilla occurred in both ADS groups due to growth of the alveolar process, and rotation of the maxilla and displacement of the orbital rim was observed in the C group. This confirms that the posterior facial plane is regarded as an axial structure that serves as an interface between the middle cranial base and the NMC (Enlow, D.H. and Hans, M.G. (1996) *Essential of Facial Growth*. WB Saunders Co., Philadelphia, PA).

**LIMITATIONS:**

It is important to take into account that these results have been obtained from an archaeological sample, with all the limitations that this implies such as being a small sample and with no absolute certainty regarding the use of the same type of deforming device within each group. Furthermore, this is a lateral two-dimensional study in which transverse development has not been analysed.

**CONCLUSIONS:**

Artificial modification of the shape of the vault has repercussions on the NMC that support the theory of an all-inclusive integration of the different cranial units in normal as well as in restricted development.

PMID: 25381444

## 14. HEADACHES

### CBT and migraine

Research Submission

#### **Outpatient Combined Group and Individual Cognitive–Behavioral Treatment for Patients With Migraine and Tension-Type Headache in a Routine Clinical Setting**

Sandra Christiansen PhD1,\* , Tim P. Jürgens MD2 and Regine Klinger PhD1

DOI: 10.1111/head.12626

Headache: The Journal of Head and Face Pain

#### **Objective**

To test the long-term clinical effectiveness (follow-up at 3, 6 and 12 months) of an outpatient combined group and individual cognitive-behavioral treatment (CBT) for headache patients following standard medical care. A decrease in headache intensity, frequency, headache-specific impairment, depression, and change of pain-related cognitions was expected.

#### **Background**

The efficacy of CBT for primary headaches has been confirmed in research, yet the translation into clinical practice has remained untested thus far.

#### **Design**

In this single-group outcome study, 87 headache patients diagnosed with migraine and/or tension-type headache received (1) headache-specific medication for 10 weeks and (2) a subsequent CBT treatment made up of 13 individual and 12 group sessions consisting of psychoeducation, progressive muscle relaxation, coping strategies for pain and stress, and goal setting skills. Booster group sessions after 3 and 6 months were implemented to stimulate individual goal attainment, and follow-up measures were recorded up to 12 months.

#### **Results**

A significant decrease was found for all primary and secondary outcome criteria, ie, average headache intensity (prae M: 6.0, standard deviation [SD]: 1.5 vs follow-up [FU] 1 year M: 5.1, SD: 1.9), headache frequency (prae M: 16.0, SD: 9.5 vs FU 1 year M: 13.4, SD: 9.9), and catastrophizing (prae M: 3.4, SD: 1.0 vs FU 1 year M: 2.6, SD: 1.1). Coping strategies were increased (prae M: 3.4, SD: .9 vs FU 1 year M: 4.0, SD: 1.0).

#### **Conclusion**

CBT treatment is a useful component within a routine clinical setting and can improve standard medical care thereby helping patients in managing their headache pain.

### School and HA/factors

#### **More evidence supports that kids' headaches increase at back-to-school time**

Nationwide Children's Hospital, 08/20/2015

Findings from Nationwide Children's Hospital physicians demonstrate that headaches increase in fall in children, a trend that may be due to back-to-school changes in stress, routines and sleep. Although it may be difficult for parents to decipher a real headache from a child just wanting to hold onto summer a little longer and avoid going back to school, there is a variety of other common triggers including poor hydration and prolonged screen time that could contribute to a child's discomfort. The increase in fall headaches may be attributed to a number of factors, including academic stressors, schedule changes and an increase in extracurricular activity. Other common headache triggers include lack of adequate sleep, skipping meals, poor hydration, too much caffeine, lack of exercise and prolonged electronic screen time. According to Dr. Jacobs, headaches can often be prevented by eating three meals a day, getting enough sleep at night without napping during the day, drinking enough liquids, and working to remove the stresses in a child's day. Pain medicines such as acetaminophen, ibuprofen or naproxen can also be helpful, but they can make headaches worse if taken too often. Parents should work with their child's doctor to manage and prevent headaches.

### HA overview

Curr Pain Headache Rep. 2015 Oct;19(10):521. doi: 10.1007/s11916-015-0521-0.

### **A Narrative Review of Evidence-Based Preventive Options for Chronic Migraine.**

Starling AJ<sup>1</sup>, Vargas BB.

Author information

#### Abstract

Chronic migraine is a debilitating disorder that affects 2 % of the global population and imparts a significant societal and economic impact. The cornerstones of chronic migraine management include making an accurate diagnosis, patient education, treatment of comorbid conditions, and selection of an appropriate, evidence-based acute and preventive treatment regimen. Although it is common to treat chronic migraine with preventive medications effective for episodic migraine, a number of treatment options exist with specific evidence for effectiveness in chronic migraine. Currently, onabotulinumtoxinA injections are the only FDA-approved preventive treatment for chronic migraine. A number of non-medication treatment options including occipital nerve and supraorbital nerve stimulation have shown promise as effective prevention for patients either unable to tolerate or unable to obtain relief from oral medications, but more research is necessary. PMID: 26286071

**Cluster and sleep**

J Headache Pain. 2015 Dec;16(1):562. doi: 10.1186/s10194-015-0562-0. Epub 2015 Aug 20.

**Neurobiology and sleep disorders in cluster headache.**

Barloese MC<sup>1</sup>.

Author information

**Abstract**

Cluster headache is characterized by unilateral attacks of severe pain accompanied by cranial autonomic features. Apart from these there are also sleep-related complaints and strong chronobiological features. The interaction between sleep and headache is complex at any level and evidence suggests that it may be of critical importance in our understanding of primary headache disorders. In cluster headache several interactions between sleep and the severe pain attacks have already been proposed. Supported by endocrinological and radiological findings as well as the chronobiological features, predominant theories revolve around central pathology of the hypothalamus. We aimed to investigate the clinical presentation of chronobiological features, the presence of concurrent sleep disorders and the relationship with particular sleep phases or phenomena, the possible role of hypocretin as well as the possible involvement of cardiac autonomic control. We conducted a questionnaire survey on 275 cluster headache patients and 145 controls as well as an in-patient sleep study including 40 CH-patients and 25 healthy controls. The findings include: A distinct circannual connection between cluster occurrence and the amount of daylight, substantially poorer sleep quality in patients compared to controls which was present not only inside the clusters but also outside, affected REM-sleep in patients without a particular temporal connection to nocturnal attacks, equal prevalence of sleep apnea in both patient and control groups, reduced levels of hypocretin-1 in the cerebrospinal fluid of patients and finally a blunted response to the change from supine to tilted position in the head-up tilt table test indicating a weakened sympathoexcitatory or stronger parasympathetic drive.

Overall, these findings support a theory of involvement of dysregulation in hypothalamic and brainstem nuclei in cluster headache pathology. Further, it is made plausible that the headache attacks are but one aspect of a more complex syndrome of central dysregulation manifesting as sleep-related complaints, sub-clinical autonomic dysregulation and of course the severe attacks of unilateral headache. Future endeavors should focus on pathological changes which persist in the attack-free periods but also heed the possibility of long-lived, cluster-induced pathology.

PMID: 26289164

**Cochlear involvement in HA**

J Headache Pain. 2015 Dec;16(1):557. doi: 10.1186/s10194-015-0557-x. Epub 2015 Aug 13.

**A study of cochlear and auditory pathways in patients with tension-type headache.**

Shen H<sup>1</sup>, Hao W, Li L, Ni D, Cui L, Shang Y.  
Author information

Abstract

**BACKGROUND:**

The purpose of this study was to systematically evaluate the function of cochlear and auditory pathways in patients suffering from tension-type headache (TTH) using various audiological methods.

**METHODS:**

Twenty-three TTH patients (46 ears) and 26 healthy controls (52 ears) were included, and routine diagnostic audiometry, extended high-frequency audiometry, acoustic reflex (ASR), transient evoked otoacoustic emissions (TEOAEs), distortion product otoacoustic emissions (DPOAEs) and suppression TEOAEs were tested.

**RESULTS:**

The TTH group showed higher thresholds ( $P < 0.05$ ) for both pure tone and extended high-frequency audiometry at all frequencies except for 9, 14 and 16 kHz. All ASR thresholds were significantly higher ( $P < 0.05$ ) in the TTH group compared with the controls, except for the ipsilateral reflex at 1 kHz, but the threshold differences between the ASR and the corresponding pure tone audiometry did not differ ( $P > 0.05$ ). For the DPOAEs, the detected rates were lower ( $P < 0.05$ ) in the TTH group compared with the controls at 4 and 6 kHz, and the amplitudes and signal to noise ratio (S/N) were not significantly different between groups. No differences in the TEOAEs ( $P > 0.05$ ) were observed for the detected rates, amplitudes, S/Ns or contralateral suppression, except for the S/Ns of the 0.5-1 kHz TEOAE responses, which were significantly higher ( $P < 0.05$ ) in the TTH group.

**CONCLUSIONS:**

The results of our study indicate that subclinical changes in cochlear function are associated with TTH.

PMID: 26272682

**Menstrual migraine**

Headache. 2015 Aug 12. doi: 10.1111/head.12640.

**Systematic Review of Preventive and Acute Treatment of Menstrual Migraine.**

Nierenburg HD<sup>1</sup>, Ailani J<sup>1</sup>, Malloy M<sup>2</sup>, Siavoshi S<sup>1</sup>, Hu NN<sup>1</sup>, Yusuf N<sup>1</sup>.

Author information

Abstract

**OBJECTIVE:**

The aim of this systematic review is to identify the efficacy of different categories of treatments for menstrual migraines as found in randomized controlled trials or open label studies with similar efficacy endpoints.

**BACKGROUND:**

Menstrual migraine is very common and approximately 50% of women have increased risk of developing migraines related to the menstrual cycle. Attacks of menstrual migraine are usually more debilitating, of longer duration, more prone to recurrence, and less responsive to acute treatment than nonmenstrual migraine attacks.

**METHODS:**

Search for evidence was done in 4 databases that included PubMed, EMBASE, Science Direct, and Web of Science. Eighty-four articles were selected for full text review by 2 separate readers. Thirty-six of the 84 articles were selected for final inclusion. Articles included randomized controlled and open label trials that focused on efficacy of acute and preventative therapies for menstrual migraine. Secondary analyses were excluded because the initial study population was not women with menstrual migraine.

**RESULTS:**

After final screening, 11 articles were selected for acute and 25 for preventive treatment of menstrual migraine. These were further subdivided into treatment categories. For acute treatment: triptans, combination therapy, prostaglandin synthesis inhibitor, and ergot alkaloids. For preventive treatment: triptans, combined therapy, oral contraceptives, estrogen, nonsteroidal anti-inflammatory drug, phytoestrogen, gonadotropin-releasing hormone agonist, dopamine agonist, vitamin, mineral, and nonpharmacological therapy were selected. Overall, triptans had strong evidence for treatment in both acute and short term prevention of menstrual migraine.

**CONCLUSIONS:**

Based on this literature search, of all categories of treatment for menstrual migraine, triptans have the most extensive research with strong evidence for both acute and preventive treatment of menstrual migraine. Further randomized controlled trials should be performed for other therapies to strengthen their use in the care of menstrual migraine patients.

**KEYWORDS:** acute treatment; menstrual migraine; menstrually related migraine; oral contraceptive; preventive treatment; systematic review; triptan

PMID: 26264117

**20 A. ROTATOR CUFF****MRI and biceps tears**

J Shoulder Elbow Surg. 2015 Aug 10. pii: S1058-2746(15)00340-7. doi: 10.1016/j.jse.2015.06.020.

**Accuracy of magnetic resonance imaging in detecting biceps pathology in patients with rotator cuff disorders: comparison with arthroscopy.**

Razmjou H<sup>1</sup>, Fournier-Gosselin S<sup>2</sup>, Christakis M<sup>3</sup>, Pennings A<sup>4</sup>, ElMaraghy A<sup>5</sup>, Holtby R<sup>6</sup>.  
Author information

Abstract

**BACKGROUND:**

There is limited information on the validity of magnetic resonance imaging (MRI) in detection of biceps disease. The purpose of this study was to examine the measurement properties of noncontrasted MRI in diagnosis of biceps disease using arthroscopic surgery as the "gold standard."

**MATERIALS AND METHODS:**

Prospectively collected surgical data of patients with impingement syndrome or rotator cuff tear, with biceps disease (study group) or without biceps disease (control group), were reviewed. MRI reports of radiologists with fellowship training in musculoskeletal imaging were retrospectively reviewed and compared with surgical findings.

**RESULTS:**

Data of 183 (130 study and 53 control) patients (73 women [40%], 110 men [60%]; mean age, 62 years [standard deviation, 9]) who had undergone arthroscopic rotator cuff-related surgery during a period of 11 years were used for analysis. Sensitivity and specificity of MRI for detection of full tears of the biceps tendon were 0.54 and 0.98, respectively. Sensitivity and specificity were 0.27 and 0.86 for partial tears of the biceps tendon, respectively. For biceps subluxation or dislocation, sensitivity was 1.00 and specificity was 0.83. The areas under the receiver operating characteristic curves, which quantify the overall accuracy of the tests, were 0.57, 0.75, and 0.92 for partial tear, full tear, and instability of the biceps tendon, respectively.

**CONCLUSIONS:**

Noncontrasted MRI has a low sensitivity and high specificity for detection of full-thickness tears of the biceps tendon. It is highly sensitive for diagnosis of instability of the long head of the biceps. However, its usefulness for diagnosis of partial tears of the biceps tendon remains limited.

**KEYWORDS:** Sensitivity; biceps pathology; rotator cuff; specificity  
PMID: 26271551

**Injury importance**

J Shoulder Elbow Surg. 2015 Aug 8. pii: S1058-2746(15)00343-2. doi: 10.1016/j.jse.2015.06.023.

**Trauma versus no trauma: an analysis of the effect of tear mechanism on tendon healing in 1300 consecutive patients after arthroscopic rotator cuff repair.**

Tan M<sup>1</sup>, Lam PH<sup>1</sup>, Le BT<sup>1</sup>, Murrell GA<sup>2</sup>.  
Author information

## Abstract

**BACKGROUND:**

Patients with rotator cuff tears often recall a specific initiating event (traumatic), whereas many cannot (nontraumatic). It is unclear how important a history of trauma is to the outcomes of rotator cuff repair.

**METHODS:**

This question was addressed in a study cohort of 1300 consecutive patients who completed a preoperative questionnaire regarding their shoulder injury and had a systematic evaluation of shoulder range of motion and strength, a primary arthroscopic rotator cuff repair performed by a single surgeon, an ultrasound scan, and the same subjective and objective measurements made of their shoulder 6 months after surgery. Post hoc, this cohort was separated into 2 groups: those who reported no history of trauma on presentation (n = 489) and those with a history of traumatic injury (n = 811).

**RESULTS:**

The retear rate in the group with no history of trauma was 12%, whereas that of the group with a history of trauma was 14% (P = .36). Those patients with a history of shoulder trauma who waited longer than 24 months had higher retear rates (20%) than those who had their surgery earlier (13%) (P = .040).

**CONCLUSION:**

Recollection of a traumatic initiating event had little effect on the outcome of arthroscopic rotator cuff repair. Duration of symptoms was important in predicting retears if patients recalled a specific initiating event but not in patients who did not recall any specific initiating event. Patients with a history of trauma should be encouraged to have their rotator cuff tear repaired within 2 years.

**KEYWORDS:** Shoulder; injury; muscle injuries; retear; rotator cuff; trauma  
PMID: 26264504

## 21. ADHESIVE CAPSULITIS

### Cortisone injections

Pain. 2015 Sep;156(9):1683-91. doi: 10.1097/j.pain.0000000000000209.

#### **Ultrasound-guided intra-articular and rotator interval corticosteroid injections in adhesive capsulitis of the shoulder: a double-blind, sham-controlled randomized study.**

Prestgaard T<sup>1</sup>, Wormgoor ME, Haugen S, Harstad H, Mowinckel P, Brox JI.  
Author information

#### Abstract

Adhesive capsulitis (frozen shoulder) is a common cause of shoulder pain and disability. Previous studies have reported that intra-articular corticosteroid injections are of benefit compared with placebo up to 6 weeks. It has been suggested that the structures primarily involved in adhesive capsulitis are the capsule and the rotator interval. Systematic reviews have concluded that there is limited evidence of the treatment effectiveness of intra-articular corticosteroid injections and that high-quality primary research is required. The aim of this study was to compare ultrasound-guided intra-articular corticosteroid injection and combined intra-articular and rotator interval injection in a double-blind, sham-controlled randomized clinical trial. The main outcome measure was the group difference in change in shoulder pain (0-10) at 6 weeks. One hundred twenty-two patients were randomized (42 to intra-articular injection, 40 to combined intra-articular/interval injection, and 40 to sham injection). For both corticosteroid injection groups, there was a significant difference compared with sham injection at week 6. The mean group difference (adjusted for gender, age, dominant arm, and duration) in change in shoulder pain for the intra-articular vs sham injection was -1.7 (95% confidence interval, -2.7 to -0.6,  $P = 0.002$ ) and -2.1 (95% confidence interval, -3.2 to -1.1,  $P = 0.0001$ ) for the combined injection vs sham injection. The significant group differences were maintained at week 12 but not at week 26. Similar results were found for the secondary outcome measures (night pain, Shoulder Pain and Disability Index). Differences between the corticosteroid groups were not significant at any time.

PMID:25919473

**Negative impact of manipulations**

J Shoulder Elbow Surg. 2015 Aug 6. pii: S1058-2746(15)00339-0. doi: 10.1016/j.jse.2015.06.019.

**Magnetic resonance imaging and short-term clinical results of severe frozen shoulder treated with manipulation under ultrasound-guided cervical nerve root block.**

Sasanuma H<sup>1</sup>, Sugimoto H<sup>2</sup>, Kanaya Y<sup>3</sup>, Iijima Y<sup>3</sup>, Saito T<sup>3</sup>, Saito T<sup>3</sup>, Takeshita K<sup>3</sup>.  
Author information

## Abstract

**BACKGROUND:**

We evaluated the magnetic resonance (MR) imaging findings and short-term clinical outcomes of severe idiopathic frozen shoulder treated with manipulation under ultrasound-guided cervical nerve root block (MUC).

**METHODS:**

The subjects were 30 patients (average age, 55.2 years; 12 men, 18 women) with severe frozen shoulder. Severe idiopathic frozen shoulder was defined as follows: a range of motion (ROM) of  $\leq 100^\circ$  in forward flexion,  $\leq 10^\circ$  in external rotation, and at or below the fifth lumbar vertebral level in internal rotation. Before the manipulation, all patients had continued global ROM loss for at least 6 months. Before and after manipulation, they underwent MR imaging. MR images and clinical results were evaluated 1 month after the procedure.

**RESULTS:**

In terms of the capsule tear pattern, MR imaging showed 14 midsubstance tears and 15 humeral avulsions of glenohumeral ligament-like lesions. An anterior labrum tear occurred in 4 shoulders, whereas 15 shoulders showed a bone bruise in the posterosuperior and anteromedial portions of the humeral head despite no humeral shaft fracture. There were significant improvements in the ROM, Constant-Murley score, American Shoulder and Elbow Surgeons score, and Numeric Rating Scale score from before treatment to 1 month after the procedure.

**CONCLUSION:**

MR imaging of patients with severe frozen shoulder after MUC showed 29 capsule tears, 4 labrum tears, and 15 bone bruises of the humeral head. Approximately 50% of patients are likely to experience bone bruising after MUC. Long-term follow-up of these patients should be performed carefully.

**KEYWORDS:** Frozen shoulder; bone bruise; capsule tear; magnetic resonance imaging; manipulation

PMID: 26256012

**25. WRIST AND HAND****Musician's hands**

J Hand Surg Am. 2015 Aug 4. pii: S0363-5023(15)00701-7. doi: 10.1016/j.jhsa.2015.06.009.

**Hand Sensibility, Strength, and Laxity of High-Level Musicians Compared to Non-Musicians.**

Sims SE<sup>1</sup>, Engel L<sup>2</sup>, Hammert WC<sup>3</sup>, Elfar JC<sup>4</sup>.

Author information

Abstract

**PURPOSE:**

To determine whether musicians have more sensitive, stronger, and flexible hands than non-musicians.

**METHODS:**

A total of 100 musicians and 100 control subjects were assessed for 2-point discrimination, Semmes-Weinstein monofilament light touch, grip and pinch strength, and laxity. Musicians were included if enrolled as instrumental performance majors at a 4-year accredited conservatory of music. Non-musician controls were university students who never or rarely engaged in playing an instrument. All subjects were between the ages of 18 and 28. The exclusion criterion was history of any hand condition, trauma, surgery, or diabetes. Statistical analyses were carried out using the t test, analysis of variance, and correlation coefficients as appropriate.

**RESULTS:**

High-level musicians in our cohort showed the same handedness (dominance) as the general population. The musicians were weaker than the non-musicians. Male musicians were significantly weaker in pinch and grip bilaterally than non-musicians, whereas female musicians were significantly weaker only in grip on the right/dominant side. Two-point discrimination was significantly less in musicians for the left/nondominant index, ring, and small fingers, and the right/dominant small and dominant index finger. Semmes-Weinstein testing was significantly better for the right/dominant digits, including the thumb, but not the left digits with the exception of the ring and nondominant middle and ring. There was no difference in laxity between the 2 groups.

**CONCLUSIONS:**

High-level musicians have, in general, more sensitive but weaker hands than non-musicians, but the differences seem small and may not be clinically important.

**TYPE OF STUDY/LEVEL OF EVIDENCE:** Diagnostic III.

**KEYWORDS:** 2-point discrimination; Laxity; light touch threshold; musicians; spatial discrimination

PMID: 26253604

**31. KNEE****Popliteal fib. Lig.**

Skeletal Radiol. 2015 Oct;44(10):1413-9. doi: 10.1007/s00256-015-2176-7. Epub 2015 May 31.

**The popliteal fibular ligament in acute knee trauma: patterns of injury on MR imaging.**

McKean D<sup>1</sup>, Yoong P, Yanny S, Thomee E, Grant D, Teh JL, Mansour R.

Author information

Abstract

**OBJECTIVE:**

To describe the patterns of injury associated with injury to the popliteofibular ligament injury.

**MATERIALS AND METHODS:**

A retrospective review was performed of 180 MRI scans undertaken for acute knee trauma. Scans were excluded if the time of injury was over 4 weeks from the time of the scan, or if there was a history of septic arthritis, inflammatory arthropathy, previous knee surgery, or significant artefact. An agreed criterion for assessing the structures of the posterolateral ligamentous complex was defined and in each scan, the popliteofibular ligament (PFL) was scored as normal or injured. The menisci, ligaments, and tendons of each knee were also assessed.

**RESULTS:**

The mean age was 25.7 years (range, 9-65 years) and 72.2 % (n = 130) patients were male. The PFL was injured in 36 cases (20 %). There is a significant association between PFL injury and ACL rupture (p = 0.0001), ITB injury (p = 0.0001), PCL injury (p = 0.0373), in addition to associations with injury to other posterolateral corner structures including the lateral collateral ligament (p = 0.0001), biceps femoris tendon (p = 0.0014), and popliteus tendon (p = 0.0014). Of our series of PFL injuries, nine cases (25 %) were associated with further injuries of posterolateral corner structures and in 27 cases (75 %) the PFL was the only posterolateral corner structure torn.

**CONCLUSIONS:**

PFL injury is not uncommon in acute knee trauma and is associated with significant internal derangement of the knee, especially anterior cruciate ligament rupture, ITB sprain, and injury to other structures within the posterolateral corner.

PMID:26025122

**32 A. KNEE/ACL****Selective strengthening of the hamstrings helps**

Knee. 2015 Aug 6. pii: S0968-0160(15)00161-1. doi: 10.1016/j.knee.2015.07.007.

**Different roles of the medial and lateral hamstrings in unloading the anterior cruciate ligament.**

Guelich DR<sup>1</sup>, Xu D<sup>2</sup>, Koh JL<sup>3</sup>, Nuber GW<sup>4</sup>, Zhang LQ<sup>5</sup>.  
Author information

Abstract

**INTRODUCTION:**

Anterior cruciate ligament injuries are closely associated with excessive loading and motion about the off axes of the knee, i.e. tibial rotation and knee varus/valgus. However, it is not clear about the 3-D mechanical actions of the lateral and medial hamstring muscles and their differences in loading the ACL. The purpose of this study was to investigate the change in anterior cruciate ligament strain induced by loading the lateral and medial hamstrings individually.

**METHODS:**

Seven cadaveric knees were investigated using a custom testing apparatus allowing for six degree-of-freedom tibiofemoral motion induced by individual muscle loading. With major muscles crossing the knee loaded moderately, the medial and lateral hamstrings were loaded independently to 200N along their lines of actions at 0°, 30°, 60° and 90° of knee flexion. The induced strain of the anterior cruciate ligament was measured using a differential variable reluctance transducer. Tibiofemoral kinematics was monitored using a six degrees-of-freedom knee goniometer.

**RESULTS:**

Loading the lateral hamstrings induced significantly more anterior cruciate ligament strain reduction (mean 0.764 [SD 0.63] %) than loading the medial hamstrings (mean 0.007 [0.2] %), (P=0.001 and effect size=0.837) across the knee flexion angles.

**CONCLUSION:**

The lateral and medial hamstrings have significantly different effects on anterior cruciate ligament loadings. More effective rehabilitation and training strategies may be developed to strengthen the lateral and medial hamstrings selectively and differentially to reduce anterior cruciate ligament injury and improve post-injury rehabilitation.

**CLINICAL RELEVANCE:**

The lateral and medial hamstrings can potentially be strengthened selectively and differentially as a more focused rehabilitation approach to reduce ACL injury and improve post-injury rehabilitation. Different ACL reconstruction procedures with some of them involving the medial hamstrings can be compared to each other for their effect on ACL loading.

**KEYWORDS:** ACL; Lateral hamstring; Medial hamstring

PMID: 26256427

**Factors influencing recovery from ACL**

Knee. 2015 Aug 7. pii: S0968-0160(15)00146-5. doi: 10.1016/j.knee.2015.06.009.

**Factors associated with a more rapid recovery after anterior cruciate ligament reconstruction using multivariate analysis.**

Scherer JE<sup>1</sup>, Moen MH<sup>2</sup>, Weir A<sup>3</sup>, Schmikli SL<sup>4</sup>, Tamminga R<sup>5</sup>, van der Hoeven H<sup>6</sup>.  
Author information

Abstract

**BACKGROUND:**

In the past, several studies investigated factors that are prognostic or associated with outcome after anterior cruciate ligament (ACL) reconstruction. A recent review showed that only limited evidence is available for most studied factors, and that insufficient analysis methods were used commonly. Therefore, the aim of this study was to add more weight to the existing evidence, about factors that are associated with a more rapid outcome after ACL reconstruction. The second aim was to use multivariate analysis to study the possible factors independently.

**METHODS:**

A cohort study was conducted with a follow-up of six months. Before surgery, patient variables were scored. Surgical variables were scored during arthroscopic ACL reconstructions with a single-bundle technique and hamstring autograft. The Lysholm score and subscales of the Knee Injury Osteoarthritis Outcome Score (KOOS) were assessed six months post surgery. A multiple analysis of variance (ANOVA) model was used to identify prognostic factors for outcome.

**RESULTS:**

In total, 118 patients were included. Patients, aged  $\leq 30$  years, with a subjective knee score  $\geq$  six, with normal flexion range of motion (ROM) of the knee, with flexion and extension strength deficit of  $\leq 20\%$ , and those with no previous knee surgery in the same knee at baseline scored significantly higher on outcome after multivariate analysis. No significant effect of surgical factors could be found.

**CONCLUSION:**

Younger age, higher subjective knee score, normal knee flexion, normal knee flexion and extension strength, and no previous knee surgery in the patients' history at baseline are associated with a more rapid recovery after ACL reconstruction.

**LEVEL OF EVIDENCE:** Level III, prognostic study.

**KEYWORDS:** ACL injury; ACL reconstruction; Outcome; Prognostic factors

PMID: 26260243

**34. PATELLA****Patella tilt**

Knee. 2014 Nov 10. pii: S0968-0160(14)00261-0. doi: 10.1016/j.knee.2014.10.012.

**Predictors of treatment response to strengthening and stretching exercises for patellofemoral pain: An examination of patellar alignment.**

Peng HT<sup>1</sup>, Song CY<sup>2</sup>.  
Author information

## Abstract

**BACKGROUND:**

Closed kinetic chain and quadriceps strengthening, combined with flexibility exercises of the lower limb musculature, is a common treatment for patellofemoral pain syndrome (PFPS). The effectiveness has been well documented; however, very little is known about which factors predict treatment success.

**METHODS:**

A total of 43 female subjects with PFPS participated in an eight-week progressive leg press (LP) strengthening and stretching exercise program. A decrease of 1.5cm on a 10cm visual analog scale (VAS) score was used as an indicator for treatment success. The baseline patellar tilt angle difference (PTA-d) due to quadriceps contraction prior to treatment was evaluated as a predictor of treatment success. The logistic regression and receiver operating characteristics (ROC) curve analysis were performed to investigate the predictive value of PTA-d.

**RESULTS:**

PTA-d could significantly predict the treatment success of LP strengthening and stretching exercises. The odds ratio (OR) for having an unsuccessful outcome was 1.19 (95% confidence interval (CI), 1.03-1.39, P<0.021) per degree increment of PTA-d. The most optimal cut-off value for the clinical discrimination of treatment success after LP strengthening and stretching exercise was -1.5° of PTA-d (sensitivity=0.74, specificity=0.71). The area under the ROC curve was 0.73 (standard error=0.08).

**CONCLUSIONS:**

Female patients with PFPS whose quadriceps contraction reduced the lateral patellar tilt prior to LP strengthening and stretching exercise treatment are more likely to experience pain relief. It seems clinically important to check dynamic patellar tilt characteristics before treatment to aid in clinical decision making.

**LEVEL OF EVIDENCE:** Cohort, II.

**KEYWORDS:** Exercise; Patella; Patellofemoral pain; Quadriceps  
PMID: 26254693

**37. OSTEOARTHRITIS/KNEE****Gait and OA**

Gait Posture. 2015 Aug 7. pii: S0966-6362(15)00792-4. doi: 10.1016/j.gaitpost.2015.07.063.

**Gait variability and motor control in people with knee osteoarthritis.**

Alkjaer T<sup>1</sup>, Raffalt PC<sup>2</sup>, Dalsgaard H<sup>2</sup>, Simonsen EB<sup>2</sup>, Petersen NC<sup>3</sup>, Bliddal H<sup>4</sup>, Henriksen M<sup>4</sup>.  
Author information

## Abstract

Knee osteoarthritis (OA) is a common disease that impairs walking ability and function. We compared the temporal gait variability and motor control in people with knee OA with healthy controls. The purpose was to test the hypothesis that the temporal gait variability would reflect a more stereotypic pattern in people with knee OA compared with healthy age-matched subjects. To assess the gait variability the temporal structure of the ankle and knee joint kinematics was quantified by the largest Lyapunov exponent and the stride time fluctuations were quantified by sample entropy and detrended fluctuation analysis. The motor control was assessed by the soleus (SO) Hoffmann (H)-reflex modulation and muscle co-activation during walking. The results showed no statistically significant mean group differences in any of the gait variability measures or muscle co-activation levels. The SO H-reflex amplitude was significantly higher in the knee OA group around heel strike when compared with the controls. The mean group difference in the H-reflex in the initial part of the stance phase (control-knee OA) was -6.6% Mmax (95% CI: -10.4 to -2.7, p=0.041). The present OA group reported relatively small impact of their disease.

These results suggest that the OA group in general sustained a normal gait pattern with natural variability but with suggestions of facilitated SO H-reflex in the swing to stance phase transition. We speculate that the difference in SO H-reflex modulation reflects that the OA group increased the excitability of the soleus stretch reflex as a preparatory mechanism to avoid sudden collapse of the knee joint which is not uncommon in knee OA.

**KEYWORDS:** Gait variability; H-reflex; Knee OA; Motor control; Walking  
PMID: 26282046

**Vibration****The effect of adding whole body vibration training to strengthening training in the treatment of knee osteoarthritis: A randomized clinical trial**

Hamid reza Bokaeian, MSc (Researcher) Amir Hoshang Bakhtiary, PhD (Researcher), Majid Mirmohamadkhani, PhD (Research) Jamile Moghimi, MD (Rheumatologist)

**Summary**

Strengthening training (ST) and whole body vibration training (WBV) alone may improve symptoms of osteoarthritis of the knee. In this study, we investigated the effect of adding WBV training to quadriceps and hamstring muscles strengthening training on functional activity, pain, quality of life and muscle strength in patients with knee osteoarthritis. 28 volunteers were randomly allocated to two groups; 1) quadriceps and hamstring muscles strengthening training (ST group, 13 patients) and 2) quadriceps and hamstring muscles strengthening training along with WBV training (ST + WBV group, 15 patients). The treatment protocol for both groups involved 3 sessions per week for 8 weeks. All measurements were performed before and after intervention. The measurements included: pain by means of a visual analogue scale (VAS), quality of life by means of the WOMAC scale, functional activity by the 2 minute walking test (2MWT), time up & go test (TUGT) and 50-foot walking test (50FWT) and the muscle peak torque (MPT), total work (TW) and muscle power (MP) as muscle performance of quadriceps and hamstring muscles by an Isokinetic Biodex machine. After intervention, the comparison of mean changes between two groups showed improvement in the WBV+ST group in terms of 2MWT, MPT, TW and MP variables ( $P < 0.05$ ). However, no significant difference was found between the experimental groups in term of pain, quality of life, TUGT and 50FWT. These results suggest that adding whole body vibration training to strengthening training may provide better treatment effects for patients with knee osteoarthritis.

**Keywords:**

WBV training, strengthening exercises, knee osteoarthritis, muscle performance, functional activity

**PT decreases comorbidities**

Arch Phys Med Rehabil. 2015 Aug 21. pii: S0003-9993(15)01076-X. doi: 10.1016/j.apmr.2015.08.410.

**Physical therapy reduces coronary artery disease and dyslipidemia among osteoarthritis patients: a nationwide database study.**

Yeh HJ<sup>1</sup>, Chou YJ<sup>2</sup>, Yang NP<sup>3</sup>, Cheng CC<sup>4</sup>, Huang N<sup>5</sup>.  
Author information

Abstract

**OBJECTIVE:**

To provide empirical evidence on the effect of early physical therapy (PT) in the first year of initial osteoarthritis (OA) diagnosis on reduction in OA related comorbidities among OA patients.

**DESIGN:**

A 4-year follow-up retrospective cohort study on patients newly diagnosed with OA within the period of 2005/01/01-2006/12/31.

**SETTING:**

The study was conducted using a nationally representative sample of one million National Health Insurance enrollees in Taiwan in 2005.

**PARTICIPANTS:**

One-to-one propensity score matching was applied to match patients who received PT within the first year of OA diagnosis (PT group, N=3403) with an equal number of OA patients who didn't receive PT (non-PT group).

**INTERVENTIONS:**

**N/A MAIN OUTCOME MEASURES:** The 4-year cumulative risks of comorbidities including coronary artery disease (CAD), diabetes mellitus, dyslipidemia, osteoporosis, gastrointestinal tract ulcer, and renal failure were estimated. Cox proportional hazard regression analysis was performed to identify the dose-response relationship between PT and the risk of OA-related comorbidities.

**RESULTS:**

3403 (25.1%) patients received PT within the first year of OA diagnosis. PT group had a significant lower 4-year cumulative risk of dyslipidemia ( $p = 0.05$ ) and potentially lower 4-year cumulative risk of CAD ( $p = 0.09$ ). The Cox proportional hazard regression analysis showed after adjusting for other potential confounders that OA patients receiving a high PT dosage had a low risk of CAD and dyslipidemia.

**CONCLUSIONS:**

OA patients received PT have a lower risk of OA related comorbidities such as dyslipidemia or CAD.

**KEYWORDS:** Comorbidity; Dyslipidemia; Osteoarthritis; Physical therapy

PMID: 26301384

**40. ANKLE SPRAINS AND INSTABILITY****Copers and noncopers in ankle sprains**

Knee Surg Sports Traumatol Arthrosc. 2015 Aug 8.

**Dynamic balance deficits in individuals with chronic ankle instability compared to ankle sprain copers 1 year after a first-time lateral ankle sprain injury.**

Doherty C<sup>1</sup>, Bleakley C, Hertel J, Caulfield B, Ryan J, Delahunt E.  
Author information

Abstract

**PURPOSE:**

To quantify the dynamic balance deficits that characterise a group with chronic ankle instability compared to lateral ankle sprain copers and non-injured controls using kinematic and kinetic outcomes.

**METHODS:**

Forty-two participants with chronic ankle instability and twenty-eight lateral ankle sprain copers were initially recruited within 2 weeks of sustaining a first-time, acute lateral ankle sprain and required to attend our laboratory 1 year later to complete the current study protocol. An additional group of non-injured individuals were also recruited to act as a control group. All participants completed the anterior, posterior-lateral and posterior-medial reach directions of the star excursion balance test. Sagittal plane kinematics of the lower extremity and associated fractal dimension of the centre of pressure path were also acquired.

**RESULTS:**

Participants with chronic ankle instability displayed poorer performance in the anterior, posterior-medial and posterior-lateral reach directions compared with controls bilaterally, and in the posterior-lateral direction compared with lateral ankle sprain copers on their 'involved' limb only. These performance deficits in the posterior-lateral and posterior-medial directions were associated with reduced flexion and dorsiflexion displacements at the hip, knee and ankle at the point of maximum reach, and coincided with reduced complexity of the centre of pressure path.

**CONCLUSION:**

In comparison with lateral ankle sprain copers and controls, participants with chronic ankle instability were characterised by dynamic balance deficits as measured using the SEBT. This was attested to reduced sagittal plane motions at the hip, knee and ankle joints, and reduced capacity of the stance limb to avail of its supporting base.

**LEVEL OF EVIDENCE:** III.

PMID: 26254090

**Cutting activities on sprained ankles**

Knee Surg Sports Traumatol Arthrosc. 2015 Aug 9.

**Kinematics and muscle activities of the lower limb during a side-cutting task in subjects with chronic ankle instability.**

Koshino Y<sup>1</sup>, Ishida T, Yamanaka M, Ezawa Y, Okunuki T, Kobayashi T, Samukawa M, Saito H, Tohyama H.

Author information

Abstract

**PURPOSE:**

The purpose of the present study was to evaluate lower limb kinematics and muscular activities during walking, side-turning while walking, and side-cutting movement in athletes with chronic ankle instability and compare the results to those of athletes without chronic ankle instability.

**METHODS:**

Lower limb kinematics and muscular activities were evaluated in 10 athletes with chronic ankle instability and 10 healthy control athletes using a three-dimensional motion analysis system and surface electromyography during the 200-ms pre-initial contact (IC) and stance phases while walking, side-turning while walking, and side-cutting.

**RESULTS:**

During walking or side-turning while walking, there were no significant differences in kinematics or muscle activities between the subjects with and without chronic ankle instability. For the side-cutting task, however, ankle inversion angles during the 200-ms pre-IC and late stance phases [effect sizes (ESs) = 0.95-1.43], the hip flexion angle (ESs = 0.94-0.96) and muscular activities of the gastrocnemius medialis (ESs = 1.04-1.73) during the early stance phase were significantly greater in the athletes with chronic ankle instability than in the healthy control athletes.

**CONCLUSIONS:**

Alterations of kinematics in athletes with chronic ankle instability were found not only at the ankle but also at hip joints during the side-cutting movement. These alterations were not detected during walking or side-turning while walking. The findings of the present study indicate that clinicians should take into account the motion of the hip joint during the side-cutting movement in persons with chronic ankle instability.

**LEVEL OF EVIDENCE: III.**

PMID: 26254794

**45 D. MANUAL THERAPY EXTREMITIES**

Great toe manip following HV surgery effective!!

J Foot Ankle Surg. 2015 Aug 6. pii: S1067-2516(15)00298-7. doi: 10.1053/j.jfas.2015.06.023.

**Joint Manipulation Under Anesthesia for Arthrofibrosis After Hallux Valgus Surgery.**

Feuerstein C<sup>1</sup>, Weil L Jr<sup>2</sup>, Weil LS Sr<sup>3</sup>, Klein EE<sup>4</sup>, Argerakis N<sup>5</sup>, Fleischer AE<sup>6</sup>.

Author information

**Abstract**

Arthrofibrosis is a known complication of hallux valgus surgery. Joint manipulation under anesthesia has been studied for adhesive capsulitis of the shoulder; however, a paucity of published data exists on the use of this modality in the foot and ankle. The purpose of the present study was to investigate the outcomes of first metatarsophalangeal joint manipulation for arthrofibrosis that occurred as a complication of bunion surgery. The study population consisted of patients attending a single foot and ankle specialty clinic who were evaluated for arthrofibrosis after bunion surgery. Patients who underwent joint manipulation under anesthesia were asked to complete a research visit in which a clinical examination was performed and the presence and severity of joint pain were assessed. A total of 38 patients (34 females, 4 males, 53 feet), with a mean age of  $55.7 \pm 11.8$  (range 30 to 83) years, agreed to participate. The mean follow-up period was  $6.5 \pm 3.4$  (range 1 to 17) years. The visual analog scale scores improved significantly from baseline to the final follow-up visit (baseline  $6.5 \pm 1.5$ , range 2 to 10; final follow-up visit  $2.3 \pm 1.5$ , range 0 to 6;  $p < .001$ ). Furthermore, joint motion had increased significantly ( $p < .001$ ) for both dorsiflexion and plantar flexion at the final follow-up examination. The final range of motion (dorsiflexion,  $r = -0.431$ ,  $p = .002$ ; plantar flexion,  $r = -0.494$ ,  $p < .001$ ) correlated highly with patient self-reported pain in the first metatarsophalangeal joint.

Our findings suggest that joint manipulation could be a useful modality for increasing first metatarsophalangeal joint mobility and alleviating pain in patients who experience arthrofibrosis after surgical correction of hallux valgus.

**KEYWORDS:** bunion deformity; complication; first metatarsophalangeal joint; great toe; stiffness

PMID: 26256296

**46 A. UPPER LIMB NEUROMOBILIZATION**

Use of finger add/abd to enhance mobilization

**Longitudinal Gliding of the Median Nerve in the Carpal Tunnel: Ultrasound Cadaveric Evaluation of Conventional and Novel Concepts of Nerve Mobilization**

Stefan Meng, MD Lukas F. Reissig, MD Reinhard Beikircher, MAS Chieh-Han John Tzou, MD Wolfgang Grisold, MD Wolfgang J. Wening, MD

**Abstract****Objective**

To evaluate median nerve excursion during conventional nerve gliding exercises and newly developed exercises, primarily comprising abduction and adduction of the fingers.

**Design**

Descriptive study.

**Setting**

Institute of Anatomy.

**Cadavers**

Random sample of 18 upper extremities of fresh whole-body human cadavers. Cadavers with neuromuscular diseases in the medical record or anatomic variations were excluded.

**Intervention**

Conventional and new nerve gliding exercises.

**Main Outcome Measures**

Distances between markers applied into the nerve and markers in the periosteum were visualized with US and measured. Comparisons of nerve excursions between different exercises were performed.

**Results**

Conventional exercises led to a substantial nerve gliding proximal to the carpal tunnel and between the head of the pronator teres (12 and 13.8 mm), but to far less in the carpal tunnel (6.6 mm). With our novel exercises, we achieved nerve gliding in the carpal tunnel of 13.8 mm. No substantial marker movement could be detected during lateral flexion of the cervical spine.

**Conclusion**

While conventional nerve gliding exercises only lead to minimal nerve excursions in the carpal tunnel, our novel exercises with the abduction and adduction of the fingers result in substantial longitudinal gliding throughout the arm. Clinical trials will have to deliver the clinical evidence.

**Key Words:** median nerve, neuropathy, carpal tunnel, carpal tunnel syndrome, ultrasound

**46 B. LOWER LIMB NEUROMOILIZATION****Prone hip extension after ND technique****Onset and maximum values of electromyographic amplitude during prone hip extension after neurodynamic technique in patients with lumbosciatic pain: a pilot study**

Giselle Horment-Lara, PT, MSc Carlos Cruz-Montecinos, PT, MSc Rodrigo Nuñez-Cortes, PT, Pablo Letelier-Horta, PT Luis Henriquez-Fuentes, PT, MSc

**Summary****Objective**

The mechanisms underlying the effects of neurodynamic techniques are still unknown. Therefore, the aim of this study was to provide a starting point for future research on explaining why neurodynamic techniques affect muscular activities in patients with sciatic pain.

**Methods**

A double-blind trial was conducted in 12 patients with lumbosciatica. Surface electromyography activity was assessed for different muscles during prone hip extension. Pre- and post-intervention values for muscle activity onset and maximal amplitude signals were determined.

**Results**

There was a significant reduction in the surface electromyography activity of maximal amplitude in the erector spinae and contralateral erector spinae ( $p < 0.05$ ). Additionally, gluteus maximus ( $p < 0.05$ ) activity onset was delayed post-intervention.

**Conclusions**

Self-neurodynamic sliding techniques modify muscular activity and onset during prone hip extension, possibly reducing unnecessary adaptations for protecting injured components. Future work will analyze the effects of self-neurodynamic sliding techniques during other physical tasks.

**Keywords:**

Electromyography, Lower back pain, Sciatica, Neuropathic pain, Neurodynamic techniques, Prone hip extension

### Butler Vs. Mulligan

#### **Effect of Butler's neural tissue mobilization and Mulligan's bent leg raise on pain and straight leg raise in patients of low back ache**

Neha Tambekar, MPT Shaila Sabnis, BPT Apoorva Phadke, MPT Nilima Bedekar, PhD

##### Summary

Low back ache (LBA) is a common musculoskeletal disorder sometimes associated with a positive limited Straight leg raise (SLR) test. Mulligan's bent leg raise (BLR) and Butler's neural tissue mobilization (NTM) are commonly used techniques for the treatment of low back ache where SLR is limited. The aim of this study was to evaluate the effect of both the techniques on pain and limited SLR in patients with LBA. Thirty one patients with LBA with radiculopathy were randomly allocated into 2 groups; BLR [n=16] NTM [n=15]. The outcome measures i.e. visual analogue scale (VAS) for pain and universal goniometer for measuring SLR range of motion (SRM) were assessed at the baseline, post intervention and after 24 hours (follow up). Within group analysis using paired t-test revealed a significant difference between pre-treatment and post-treatment VAS and SRM score ( $p < 0.05$ ).

However no difference was seen between pre-treatment and follow up ( $p > 0.05$ ). The study showed that both techniques produce immediate improvement in pain and SLR range but this effect was not maintained during the follow up period.

Keywords: Low back pain, Mulligan bent leg raise technique, Butler's neural tissue mobilization, SLR

**48 A. STM****Anatomy trains**

Arch Phys Med Rehabil. 2015 Aug 14. pii: S0003-9993(15)01064-3. doi: 10.1016/j.apmr.2015.07.023.

**What is evidence-based about myofascial chains? A systematic review.**

Wilke J<sup>1</sup>, Krause F<sup>2</sup>, Vogt L<sup>2</sup>, Banzer W<sup>2</sup>.  
Author information

Abstract

**OBJECTIVE:**

To provide evidence for the existence of six myofascial meridians proposed by Myers (1997) based on anatomical dissection studies.

**DATA SOURCES:**

Relevant articles published between 1900 and December 2014 were searched in MEDLINE (Pubmed), ScienceDirect and Google Scholar.

**STUDY SELECTION:**

Peer-reviewed human anatomical dissection studies reporting morphological continuity between the muscular constituents of the examined meridians were included. If no study demonstrating a structural connection between two muscles was found, papers on general anatomy of the corresponding body region were targeted.

**DATA EXTRACTION:**

A continuity between two muscles was only documented if two independent investigators agreed that it was reported clearly. Also, two independent investigators rated methodological quality of included studies by means of a validated assessment tool (QUACS).

**DATA SYNTHESIS:**

The literature search identified 6589 articles. Of these, 62 papers met the inclusion criteria. The studies reviewed suggest strong evidence for the existence of three myofascial meridians: the superficial back line (all three transitions verified, based on 14 studies), the back functional line (all three transitions verified, 8 studies) and the front functional line (both transitions verified, 6 studies). Moderate to strong evidence is available for parts of the spiral line (five of nine verified transitions, 21 studies) and the lateral line (two of five verified transitions, 10 studies). No evidence exists for the superficial front line (no verified transition, 7 studies).

**CONCLUSIONS:**

The present systematic review suggests that most skeletal muscles of the human body are directly linked by connective tissue. Examining the functional relevance of these myofascial chains is the most urgent task of future research. Strain transmission along meridians would both open a new frontier for the understanding of referred pain and provide a rationale for the development of more holistic treatment approaches.

**KEYWORDS:** anatomy trains; continuity; fascia; meridians  
PMID: 26281953

**50 A. MOTOR CONTROL****UE function**

Gait Posture. 2015 Aug 6. pii: S0966-6362(15)00790-0. doi: 10.1016/j.gaitpost.2015.07.061.

**Upper extremity coordination strategies depending on task demand during a basic daily activity.**

Ricci FP<sup>1</sup>, Santiago PR<sup>2</sup>, Zampar AC<sup>3</sup>, Pinola LN<sup>4</sup>, Fonseca MC<sup>5</sup>.

Author information

**Abstract**

Injury conditions affecting the upper extremity may lead to severe functional impairment and an accurate evaluation is needed in order to select the most effective treatment in a rehabilitation program. This study focused on simultaneous electromyographic and kinematic analysis to assess movement patterns of upper extremity during a basic daily activity, considering different demands existing within the task. Twenty-five healthy subjects, average age 19.8 ys SD 1.7 ys, with no upper extremity impairment, were assessed by means of electromyography (EMG) and a 3D motion capture system while performing a task that required reach, transport and release. Integrated EMG (iEMG), timing of muscle onset and active range of motion (AROM) were calculated for each subject. Data were compared within each phase and between the three phases and a repeated measure ANOVA was used for statistical analysis. We found early activation of upper trapezius associated with high activity of serratus anterior for proximal stability while anterior deltoid and triceps brachii performed shoulder flexion and elbow extension, in Reach phase. In Transport phase there was early and higher activation of upper trapezius, higher muscle activity of almost all muscles and increased AROM of all joints. No change in flexion/extension wrist posture with increased forearm muscles activity were identified as the main control strategy to keep optimal grasping. Triceps brachii was found to act as an important synergist in shoulder abduction and extension in free load conditions. Such information can lead clinicians to more specific assessment and subsequent better intervention in upper extremity rehabilitation.

**KEYWORDS:** Activities of daily living; Electromyography; Evaluation; Kinematic analysis; Performance test; Upper extremity  
PMID: 26282047

**52. EXERCISE****Strength training in the elderly**

Scand J Med Sci Sports. 2015 Aug 14. doi: 10.1111/sms.12537.

**Strength training improves muscle aerobic capacity and glucose tolerance in elderly.**

Frank P<sup>1,2</sup>, Andersson E<sup>1,3</sup>, Pontén M<sup>1</sup>, Ekblom B<sup>1</sup>, Ekblom M<sup>1</sup>, Sahlin K<sup>1</sup>.

Author information

**Abstract**

The primary aim of this study was to investigate the effect of short-term resistance training (RET) on mitochondrial protein content and glucose tolerance in elderly. Elderly women and men (age  $71 \pm 1$ , mean  $\pm$  SEM) were assigned to a group performing 8 weeks of resistance training (RET,  $n = 12$ ) or no training (CON,  $n = 9$ ). The RET group increased in (i) knee extensor strength (concentric  $+11 \pm 3\%$ , eccentric  $+8 \pm 3\%$  and static  $+12 \pm 3\%$ ), (ii) initial (0-30 ms) rate of force development ( $+52 \pm 26\%$ ) and (iii) contents of proteins related to signaling of muscle protein synthesis (Akt  $+69 \pm 20$  and mammalian target of rapamycin  $+69 \pm 32\%$ ). Muscle fiber type composition changed to a more oxidative profile in RET with increased amount of type IIa fibers ( $+26.9 \pm 6.8\%$ ) and a trend for decreased amount of type IIx fibers ( $-16.4 \pm 18.2\%$ ,  $P = 0.068$ ). Mitochondrial proteins (OXPHOS complex II, IV, and citrate synthase) increased in RET by  $+30 \pm 11\%$ ,  $+99 \pm 31\%$  and  $+29 \pm 8\%$ , respectively.

RET resulted in improved oral glucose tolerance measured as reduced area under curve for glucose ( $-21 \pm 26\%$ ) and reduced plasma glucose 2 h post-glucose intake ( $-14 \pm 5\%$ ). In CON parameters were unchanged or impaired. In conclusion, short-term resistance training in elderly not only improves muscular strength, but results in robust increases in several parameters related to muscle aerobic capacity.

**KEYWORDS:** Exercise; insulin sensitivity; mTOR; mitochondria; resistance training

PMID: 26271931

**Exercise for chronic pain**

Best Pract Res Clin Rheumatol. 2015 Feb;29(1):120-30. doi: 10.1016/j.berh.2015.04.022. Epub 2015 May 23.

**Physical exercise as non-pharmacological treatment of chronic pain: Why and when.**

Ambrose KR<sup>1</sup>, Golightly YM<sup>2</sup>.  
Author information

**Abstract**

Chronic pain broadly encompasses both objectively defined conditions and idiopathic conditions that lack physical findings. Despite variance in origin or pathogenesis, these conditions are similarly characterized by chronic pain, poor physical function, mobility limitations, depression, anxiety, and sleep disturbance, and they are treated alone or in combination by pharmacologic and non-pharmacologic approaches, such as physical activity (aerobic conditioning, muscle strengthening, flexibility training, and movement therapies). Physical activity improves general health, disease risk, and progression of chronic illnesses such as cardiovascular disease, type 2 diabetes, and obesity. When applied to chronic pain conditions within appropriate parameters (frequency, duration, and intensity), physical activity significantly improves pain and related symptoms. For chronic pain, strict guidelines for physical activity are lacking, but frequent movement is preferable to sedentary behavior. This gives considerable freedom in prescribing physical activity treatments, which are most successful when tailored individually, progressed slowly, and account for physical limitations, psychosocial needs, and available resources.

**KEYWORDS:**

Aerobic; Arthritis; Chronic pain; Chronic widespread pain; Exercise; Fibromyalgia; Non-pharmacological treatment; Strength

PMID: 26267006

**56. ATHLETICS****Hand injuries in boxers**

Br J Sports Med. 2015 Sep;49(17):1100-7. doi: 10.1136/bjsports-2015-094755. Epub 2015 Jul 17.

**Boxing injury epidemiology in the Great Britain team: a 5-year surveillance study of medically diagnosed injury incidence and outcome.**

Loosemore M<sup>1</sup>, Lightfoot J<sup>1</sup>, Palmer-Green D<sup>2</sup>, Gatt I<sup>3</sup>, Bilzon J<sup>4</sup>, Beardsley C<sup>5</sup>.

Author information

Abstract

**OBJECTIVES:**

There has been no comprehensive injury report of elite-level amateur boxers in competition and training. We reviewed injuries in training and competition in the Great Britain (GB) amateur boxing squad between 2005 and 2009.

**METHODS:**

Longitudinal, prospective injury surveillance over 5 years of the GB boxing squad from 2005 to 2009. 66 boxers passed through the squad. The location, region affected, description, and the duration of each injury were recorded by the team doctor and team physiotherapist. We recorded whether the injury occurred during competition or training, and also whether it was a new or a recurrent injury. The injury rate during competition was calculated as the number of injuries per 1000 h.

**RESULTS:**

More injuries affected the hand than any other body location. This was the case overall, in training and competition individually, and for both new and recurrent injuries. More injuries occurred during training than during competition, and most injuries were new rather than recurrent. Total injury rate during competition was 828 per 1000 h and hand injury rate in competition was 302 injuries per 1000 h. Hand injury rate in competition was significantly higher than at the other locations. The incidence of concussion is comparatively low.

**CONCLUSIONS:** Injury prevention should aim to protect the hands and wrists of elite amateur boxers.

**KEYWORDS:** Boxing/Kick Boxing; Concussion; Hand; Injuries; Wrist

PMID: 26192194

**Light exposure and performance**

Scand J Med Sci Sports. 2015 Aug 14. doi: 10.1111/sms.12535.

**Dose-response relationship between light exposure and cycling performance.**

Knaier R<sup>1</sup>, Meister S<sup>1</sup>, Aeschbacher T<sup>1</sup>, Gemperle D<sup>1</sup>, Rossmeissl A<sup>1</sup>, Cajochen C<sup>2</sup>, Schmidt-Trucksäss A<sup>1</sup>.

Author information

**Abstract**

Light has a stimulating effect on physical performance if scheduled according to the chronotype, but dose-dependent effects on performance have not yet been examined. Three groups of healthy men ( $25.1 \pm 3.1$  years) were exposed to light for different durations in a parallel group design before a 40-min time-trial. In each group, subjects were exposed to either bright light (BL, 4420 lx) or moderate light (ML, 230 lx) in a randomized order in a crossover design. The durations of light exposure were 120 min prior to and during exercise (2HEX; n = 16), 60 min prior to and during exercise (1HEX; n = 10), or only for 60 min prior to exercise (1H; n = 15). Total work performed during the time-trial in kJ in the 2HEX group was significantly higher in the BL setting (527 kJ) than in ML (512 kJ) ( $P = 0.002$ ), but not in 1HEX (BL: 485 kJ; ML: 498 kJ) or 1H (BL: 519 kJ; ML: 514 kJ) ( $P = 0.770$ ;  $P = 0.485$ ).

There was a significant ( $P = 0.006$ ) positive dose-response relationship between the duration of light exposure and the work performed over the three doses of light exposure. A long duration light exposure is an effective tool to increase total work in a medium length time-trial in subjects normalized for their individual chronotype.

**KEYWORDS:** Bright light; chronotype; circadian rhythm; physical performance; time-trial  
PMID: 26271769

**Imagery and performance**

Scand J Med Sci Sports. 2015 Aug 6. doi: 10.1111/sms.12525.

**The applied model of imagery use: Examination of moderation and mediation effects.**

Koehn S<sup>1</sup>, Stavrou NA<sup>2,3</sup>, Young JA<sup>4</sup>, Morris T<sup>4</sup>.

Author information

**Abstract**

The applied model of mental imagery use proposed an interaction effect between imagery type and imagery ability. This study had two aims: (a) the examination of imagery ability as a moderating variable between imagery type and dispositional flow, and (b) the testing of alternative mediation models. The sample consisted of 367 athletes from Scotland and Australia, who completed the Sport Imagery Questionnaire, Sport Imagery Ability Questionnaire, and Dispositional Flow Scale-2. Hierarchical regression analysis showed direct effects of imagery use and imagery ability on flow, but no significant interaction. Mediation analysis revealed a significant indirect path, indicating a partially mediated relationship ( $P = 0.002$ ) between imagery use, imagery ability, and flow. Partial mediation was confirmed when the effect of cognitive imagery use and cognitive imagery ability was tested, and a full mediation model was found between motivational imagery use, motivational imagery ability, and flow. The results are discussed in conjunction with potential future research directions on advancing theory and applications.

**KEYWORDS:** Imagery; competition; flow; mediation; moderation

PMID: 26247483

**57. GAIT****Gait and OA**

Gait Posture. 2015 Aug 7. pii: S0966-6362(15)00792-4. doi: 10.1016/j.gaitpost.2015.07.063.

**Gait variability and motor control in people with knee osteoarthritis.**

Alkjaer T<sup>1</sup>, Raffalt PC<sup>2</sup>, Dalsgaard H<sup>2</sup>, Simonsen EB<sup>2</sup>, Petersen NC<sup>3</sup>, Bliddal H<sup>4</sup>, Henriksen M<sup>4</sup>.  
Author information

## Abstract

Knee osteoarthritis (OA) is a common disease that impairs walking ability and function. We compared the temporal gait variability and motor control in people with knee OA with healthy controls. The purpose was to test the hypothesis that the temporal gait variability would reflect a more stereotypic pattern in people with knee OA compared with healthy age-matched subjects. To assess the gait variability the temporal structure of the ankle and knee joint kinematics was quantified by the largest Lyapunov exponent and the stride time fluctuations were quantified by sample entropy and detrended fluctuation analysis. The motor control was assessed by the soleus (SO) Hoffmann (H)-reflex modulation and muscle co-activation during walking. The results showed no statistically significant mean group differences in any of the gait variability measures or muscle co-activation levels. The SO H-reflex amplitude was significantly higher in the knee OA group around heel strike when compared with the controls. The mean group difference in the H-reflex in the initial part of the stance phase (control-knee OA) was -6.6% Mmax (95% CI: -10.4 to -2.7, p=0.041). The present OA group reported relatively small impact of their disease.

These results suggest that the OA group in general sustained a normal gait pattern with natural variability but with suggestions of facilitated SO H-reflex in the swing to stance phase transition. We speculate that the difference in SO H-reflex modulation reflects that the OA group increased the excitability of the soleus stretch reflex as a preparatory mechanism to avoid sudden collapse of the knee joint which is not uncommon in knee OA.

**KEYWORDS:** Gait variability; H-reflex; Knee OA; Motor control; Walking  
PMID: 26282046

**58. RUNNING****Cost of running injuries**

Scand J Med Sci Sports. 2015 Aug 17. doi: 10.1111/sms.12541.

**Health and economic burden of running-related injuries in runners training for an event: A prospective cohort study.**

Hespanhol Junior LC<sup>1</sup>, van Mechelen W<sup>1,2,3,4</sup>, Postuma E<sup>5</sup>, Verhagen E<sup>1,3,6</sup>.  
Author information

**Abstract**

Prospective running-related injury (RRI) data from runners training for an event are scarce, especially with regard to RRI-associated costs. Therefore, the aim of this study was to investigate the prevalence and economic burden of RRIs in runners participating in an organized training program preparing them for an event. This was a prospective cohort study with 18 weeks of follow-up. Individuals aged 18 or older and registered to participate in an organized running program were eligible. Follow-up surveys were sent every 2 weeks to collect data about running exposure, RRIs, and costs. Of the 161 potential participants, 53 (32.9%) were included in this study. A total of 32 participants reported 41 RRIs. The mean prevalence during follow-up was 30.8% [95% confidence interval (CI) 25.6-36.0%]. Overuse was the main mechanism of RRI (85.4%, n = 35). An RRI was estimated to have an economic burden of €57.97 (95% CI €26.17-94.00) due to healthcare utilization (direct costs) and €115.75 (95% CI €10.37-253.73) due to absenteeism from paid work (indirect costs).

These results indicate that the health and economic burden of RRIs may be considered significant for public health. Therefore, prevention programs are needed for runners participating in organized training programs.

**KEYWORDS:** Sports injury; costs and cost analysis; epidemiological monitoring; epidemiology; public health surveillance

PMID: 26282068

**59. PAIN****Chronic pain and TP's**

Pain Med. 2015 Aug 26. doi: 10.1111/pme.12781.

**Pretreatment anxiety and pain acceptance are associated with response to trigger point injection therapy for chronic myofascial pain.**

Healy GM<sup>1</sup>, Finn DP<sup>1,2</sup>, O'Gorman DA<sup>1,3</sup>, Maharaj C<sup>1,3</sup>, Raftery M<sup>1,4</sup>, Ruane N<sup>1,3</sup>, Mitchell C<sup>1,3</sup>, Sarma K<sup>4</sup>, Bohacek M<sup>4</sup>, McGuire BE<sup>1,4</sup>.

Author information

Abstract

**BACKGROUND AND AIM:**

This study examined the psychosocial profile of patients who responded or did not respond to trigger point injection therapy for chronic myofascial pain.

**METHODS:**

Seventy one patients with a diagnosis of chronic myofascial pain of the paraspinous muscles completed a pretreatment questionnaire measuring demographic and social factors, and validated scales to assess pain intensity, pain interference (physical and emotional), and defined psychological characteristics (pain catastrophizing, pain acceptance, pain self-efficacy, mood and anxiety). Trigger point injection therapy of the affected areas of myofascial pain was performed and follow-up was conducted by telephone at one week (n = 65) and one month (n = 63) post intervention to assess treatment outcome (pain intensity and pain-related physical interference).

**RESULTS:**

At one week follow-up and one-month follow-up, using pain-related physical interference as the outcome measure, we found that those who responded well to treatment were characterized by a lower level of pretreatment anxiety and a higher level of pain acceptance, with anxiety being the strongest predictor.

**CONCLUSION:**

These results suggest that responses to interventional pain management in chronic myofascial paraspinous pain may be influenced by psychological characteristics, especially pretreatment anxiety.

**KEYWORDS:** Chronic pain; anxiety; myofascial; pain acceptance; trigger point  
PMID:26309134

**Facial recognition of pain expression**

Pain. 2015 Sep;156(9):1670-82. doi: 10.1097/j.pain.0000000000000226.

**The role of spatial frequency information in the recognition of facial expressions of pain.**

Wang S<sup>1</sup>, Eccleston C, Keogh E.

Author information

**Abstract**

Being able to detect pain from facial expressions is critical for pain communication. Alongside identifying the specific facial codes used in pain recognition, there are other types of more basic perceptual features, such as spatial frequency (SF), which refers to the amount of detail in a visual display. Low SF carries coarse information, which can be seen from a distance, and high SF carries fine-detailed information that can only be perceived when viewed close up. As this type of basic information has not been considered in the recognition of pain, we therefore investigated the role of low-SF and high-SF information in the decoding of facial expressions of pain. Sixty-four pain-free adults completed 2 independent tasks: a multiple expression identification task of pain and core emotional expressions and a dual expression "either-or" task (pain vs fear, pain vs happiness). Although both low-SF and high-SF information make the recognition of pain expressions possible, low-SF information seemed to play a more prominent role. This general low-SF bias would seem an advantageous way of potential threat detection, as facial displays will be degraded if viewed from a distance or in peripheral vision. One exception was found, however, in the "pain-fear" task, where responses were not affected by SF type.

Together, this not only indicates a flexible role for SF information that depends on task parameters (goal context) but also suggests that in challenging visual conditions, we perceive an overall affective quality of pain expressions rather than detailed facial features.

PMID: 26075962

**Transcranial Magnetic Stim**

**Pain.** 2015 Sep;156(9):1601-14. doi: 10.1097/j.pain.0000000000000210.

**Transcranial magnetic stimulation of the brain: guidelines for pain treatment research.**

Klein MM<sup>1</sup>, Treister R, Raij T, Pascual-Leone A, Park L, Nurmikko T, Lenz F, Lefaucheur JP, Lang M, Hallett M, Fox M, Cudkowicz M, Costello A, Carr DB, Ayache SS, Oaklander AL.  
Author information

## Abstract

Recognizing that electrically stimulating the motor cortex could relieve chronic pain sparked development of noninvasive technologies. In transcranial magnetic stimulation (TMS), electromagnetic coils held against the scalp influence underlying cortical firing. Multiday repetitive transcranial magnetic stimulation (rTMS) can induce long-lasting, potentially therapeutic brain plasticity. Nearby ferromagnetic or electronic implants are contraindications. Adverse effects are minimal, primarily headaches. Single provoked seizures are very rare. Transcranial magnetic stimulation devices are marketed for depression and migraine in the United States and for various indications elsewhere. Although multiple studies report that high-frequency rTMS of the motor cortex reduces neuropathic pain, their quality has been insufficient to support Food and Drug Administration application. Harvard's Radcliffe Institute therefore sponsored a workshop to solicit advice from experts in TMS, pain research, and clinical trials. They recommended that researchers standardize and document all TMS parameters and improve strategies for sham and double blinding. Subjects should have common well-characterized pain conditions amenable to motor cortex rTMS and studies should be adequately powered. They recommended standardized assessment tools (eg, NIH's PROMIS) plus validated condition-specific instruments and consensus-recommended metrics (eg, IMMPACT).

Outcomes should include pain intensity and qualities, patient and clinician impression of change, and proportions achieving 30% and 50% pain relief. Secondary outcomes could include function, mood, sleep, and/or quality of life. Minimum required elements include sample sources, sizes, and demographics, recruitment methods, inclusion and exclusion criteria, baseline and posttreatment means and SD, adverse effects, safety concerns, discontinuations, and medication-usage records. Outcomes should be monitored for at least 3 months after initiation with prespecified statistical analyses. Multigroup collaborations or registry studies may be needed for pivotal trials.

PMID: 25919472

**Chronic pain measurements**

Best Pract Res Clin Rheumatol. 2015 Feb;29(1):164-86. doi: 10.1016/j.berh.2015.04.023. Epub 2015 Jun 19.

**How to measure chronic pain: New concepts.**

Salaffi F<sup>1</sup>, Sarzi-Puttini P<sup>2</sup>, Atzeni F<sup>3</sup>.

Author information

## Abstract

The assessment of chronic pain and its impact on physical, emotional and social functions requires the use of multidimensional qualitative and health-related quality of life instruments, but there is still little agreement concerning what these may be or which approach to adopt. Increasing focus on patient-reported outcomes in medicine has had the positive effect of giving prominence to the views and experiences of patients with chronic pain, and the ecological momentary assessment (EMA) approach allows patients' symptoms to be assessed in their natural environment in real time without the need for recall. Computerised EMA symptom diaries are now generally regarded as the 'gold standard' in the field of pain medicine, and they have recently attracted increasing attention as an essential component of health-care monitoring systems based on the information and communication technology. A web/Internet-based diary and patient terminal seem to provide a ubiquitous, easy-to-use and cost-efficient solution for patient-centred data acquisition.

In addition, telemonitoring is increasingly seen as an effective means of supporting shared decision-making as it can inform patients about typical symptoms, treatment options and prognosis, and it is widely accepted as an additional source of information. This article reviews some of the instruments used to assess chronic pain, including newly developed and well-established validated multidimensional instruments and health-care monitoring systems based on information and communication technology, and it discusses their advantages and limitations.

**KEYWORDS:**

Assessment tools; Chronic pain; Clinimetrics; Health-related quality of life; Information and communication technology; Pain scales; Rheumatology

PMID: 26267010

**60. COMPLEX REGIONAL PAIN****Pain in CRP**

Best Pract Res Clin Rheumatol. 2015 Feb;29(1):71-6. doi: 10.1016/j.berh.2015.04.032. Epub 2015 Jun 9.

**The words of pain in complex regional pain syndrome.**

Casale R<sup>1</sup>, Atzeni F<sup>2</sup>, Masala IF<sup>3</sup>, Sarzi-Puttini P<sup>4</sup>.

Author information

**Abstract**

Complex regional pain syndrome (CRPS) encompasses a wide range of painful conditions, but it is characterised by continuing (spontaneous and/or evoked) limb pain that is seemingly disproportionate in time or degree to the usual course of any known trauma or other lesion. The pain is regional, with distal predominance usually but not related to a specific nerve territory or dermatome, and it is usually associated with abnormal sensory, motor, sudomotor, vasomotor and/or trophic findings.

The complexity of the aetiopathogenetic factors making up the clinical picture of CRPS is mirrored by the inconsistency of almost all of the monotherapies used to treat it so far. Motor and sensory symptoms significantly interfere with the patients' daily function and quality of life, and almost all of them report substantial disability in their working and recreational activities, mood and mobility.

**KEYWORDS:** Complex regional pain syndrome; Disability; Pain; Therapy  
PMID: 26267001

## Overview

BMJ. 2015 Jul 29;351:h2730. doi: 10.1136/bmj.h2730.

**Complex regional pain syndrome.**

Bruehl S<sup>1</sup>.

Author information

## Abstract

Complex regional pain syndrome is a chronic pain condition characterized by autonomic and inflammatory features. It occurs acutely in about 7% of patients who have limb fractures, limb surgery, or other injuries. Many cases resolve within the first year, with a smaller subset progressing to the chronic form. This transition is often paralleled by a change from "warm complex regional pain syndrome," with inflammatory characteristics dominant, to "cold complex regional pain syndrome" in which autonomic features dominate. Multiple peripheral and central mechanisms seem to be involved, the relative contributions of which may differ between individuals and over time. Possible contributors include peripheral and central sensitization, autonomic changes and sympatho-afferent coupling, inflammatory and immune alterations, brain changes, and genetic and psychological factors. The syndrome is diagnosed purely on the basis of clinical signs and symptoms. Effective management of the chronic form of the syndrome is often challenging. Few high quality randomized controlled trials are available to support the efficacy of the most commonly used interventions.

Reviews of available randomized trials suggest that physical and occupational therapy (including graded motor imagery and mirror therapy), bisphosphonates, calcitonin, subanesthetic intravenous ketamine, free radical scavengers, oral corticosteroids, and spinal cord stimulation may be effective treatments. Multidisciplinary clinical care, which centers around functionally focused therapies is recommended. Other interventions are used to facilitate engagement in functional therapies and to improve quality of life.

PMID: 26224572

**62 A. NUTRITION/VITAMINS****Gluten sensitivity**

Aliment Pharmacol Ther. 2015 Aug 27. doi: 10.1111/apt.13372.

**Randomised clinical study: gluten challenge induces symptom recurrence in only a minority of patients who meet clinical criteria for non-coeliac gluten sensitivity.**

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Author information

Abstract

**BACKGROUND:**

It is unknown whether symptoms in non-coeliac patients (non-CD) meeting clinical diagnostic criteria for noncoeliac gluten sensitivity (NCGS) are specifically triggered by gluten.

**AIM:**

To assess gluten sensitivity in patients diagnosed with NCGS.

**METHODS:**

We studied 35 non-CD subjects (31 females) that were on a gluten-free diet (GFD), in a double-blind challenge study. Participants were randomised to receive either gluten-containing flour or gluten-free flour for 10 days, followed by a 2-week washout period and were then crossed over. The main outcome measure was their ability to identify which flour contained gluten. Secondary outcome measures were based upon Gastrointestinal Symptoms Rating Scale (GSRS) scores.

**RESULTS:**

The gluten-containing flour was correctly identified by 12 participants (34%), who were classified as having NCGS. Their mean GSRS dimension scores were significantly higher following gluten challenge compared to baseline. The scores were: pain,  $1.7 \pm 0.8$  vs.  $2.6 \pm 1.0$ ; reflux,  $1.6 \pm 0.5$  vs.  $2.2 \pm 0.9$ ; indigestion,  $1.9 \pm 0.7$  vs.  $3.2 \pm 1.1$ ; diarrhoea,  $1.6 \pm 0.7$  vs.  $2.9 \pm 1.5$  and constipation,  $1.9 \pm 0.9$  vs.  $2.9 \pm 1.3$ . Seventeen participants (49%) erroneously considered the gluten-free flour to contain gluten. Their mean GSRS dimension scores were significantly higher following gluten-free flour challenge compared to baseline. The scores were: pain,  $1.6 \pm 0.9$  vs.  $3.0 \pm 0.9$ ; reflux,  $1.4 \pm 0.5$  vs.  $2.3 \pm 1.1$ ; indigestion,  $2.0 \pm 1.1$  vs.  $3.7 \pm 1.1$ ; diarrhoea,  $1.6 \pm 0.7$  vs.  $3.0 \pm 1.2$  and constipation,  $1.6 \pm 0.9$  vs.  $2.6 \pm 1.3$ . The other six participants (17%) were unable to distinguish between the flours.

**CONCLUSION:**

Double-blind gluten challenge induces symptom recurrence in just one-third of patients fulfilling the clinical diagnostic criteria for non-coeliac gluten sensitivity.

PMID:26310131

**Fructose and liver disease**

Curr Opin Clin Nutr Metab Care. 2015 Sep;18(5):490-5. doi: 10.1097/MCO.000000000000203.

**Fructose and liver function - is this behind nonalcoholic liver disease?**

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Author information

Abstract

***PURPOSE OF REVIEW:***

The purpose was to summarize recent advances in the understanding of nonalcoholic fatty liver disease (NAFLD) pathophysiology and the role of fructose in NAFLD.

***RECENT FINDINGS:***

Epidemiological studies continue to point to a strong association between high fructose intake and NAFLD and its severity. New studies of NAFLD reveal the importance of upregulated de novo lipogenesis as a key feature in its pathophysiology along with increased visceral adiposity and alteration of gut microbiome. Studies of fructose in NAFLD show how this nutrient may uniquely exacerbate the phenotype of NAFLD. The timing of exposure to fructose may be important with early (in utero) exposure being particularly harmful.

***SUMMARY:***

Fructose is a potentially modifiable environmental exposure that appears to exacerbate NAFLD through multiple mechanisms. Although larger, longer clinical studies are still needed, it appears that limitation of fructose sources in the diet is beneficial in NAFLD.

PMID: 26203597

## Sugary drinks and high death toll

### Sugary drinks found to be linked to high death tolls worldwide

Nobody should be surprised by the fact that sugary drinks are not good for you, but a recent study indicates that consumption of sugary drinks may lead to an estimated 184,000 adult deaths each year worldwide, according to research published in the journal *Circulation* and previously presented as an abstract at the American Heart Association Council on Epidemiology and Prevention in 2013. The perils of sugary drink consumption was calculated in this journal article.

“Many countries in the world have a significant number of deaths occurring from a single dietary factor, sugar-sweetened beverages. It should be a global priority to substantially reduce or eliminate sugar-sweetened beverages from the diet,” explained Dariush Mozaffarian, MD, DrPH, senior author of the study and dean of the Friedman School of Nutrition Science and Policy at Tufts University in Boston. In the first detailed global report on the impact of sugar-sweetened beverages, researchers estimated deaths and disabilities from [diabetes](#), [heart disease](#), and cancers in 2010. In this analysis, sugar sweetened beverages were defined as any sugar-sweetened sodas, fruit drinks, sports/energy drinks, sweetened iced teas, or homemade sugary drinks such as frescas, that contained at least 50 kcal per 8oz serving. Drinks made up of 100% fruit juice was excluded. The researchers pointed out that estimates of drink consumption were made from 62 dietary surveys including 611,971 individuals conducted between 1980 and 2010 across 51 countries, along with data on national availability of sugar in 187 countries and other information. This allowed capture of geographical, gender and age variation in consumption levels of sugar-sweetened beverages in different populations. Based on meta-analyses of other published evidence on health harms of sugar-sweetened beverages, the investigators calculated the direct impact on diabetes and the obesity-related effects on cardiovascular disease, diabetes, and cancer. In 2010, the researchers estimate that sugar-sweetened beverages consumption may have been responsible for approximately: 133,000 deaths from diabetes 45,000 deaths from cardiovascular disease 6,450 deaths from cancer “Some population dietary changes, such as increasing fruits and vegetables, can be challenging due to agriculture, costs, storage, and other complexities. This is not complicated. There are no health benefits from sugar-sweetened beverages, and the potential impact of reducing consumption is saving tens of thousands of deaths each year,” Dr. Mozaffarian noted. The impact of sugar-sweetened beverages varied greatly between populations. At the extremes, the estimated percentage of deaths was less than 1% in Japanese over 65 years old, but 30% in Mexican adults younger than 45. Of the 20 most populous countries, Mexico had the highest death rate attributable to sugar-sweetened beverages with an estimated 405 deaths per million adults (24,000 total deaths) and the U.S. ranked second with an estimated 125 deaths per million adults (25,000 total deaths) (See Table). About 76% of the estimated sugar-sweetened beverage-related deaths occurred in low- or middle-income countries. In nations of the Caribbean and Latin America, such as Mexico, homemade sugary drinks (eg, frescas) are popular and consumed in addition to commercially prepared sugar-sweetened beverages. “Among the 20 countries with the highest estimated sugar-sweetened beverage-related deaths, at least 8 were in Latin America and the Caribbean, reflecting the high intakes in that region of the world,” said Gitanjali Singh, PhD, lead author of the study and a research assistant professor at the Friedman School. Overall, in younger adults, the percent of chronic disease attributed to sugar-sweetened beverages was higher than the percent in older adults. “The health impact of sugar-sweetened beverage intake on the young is important because younger adults form a large sector of the workforce in many countries, so the economic impact of sugar-sweetened beverage-related deaths and disability in this age group can be significant. It also raises concerns about the future. If these young people continue to consume high levels as they age, the effects of high consumption will be compounded by the effects of aging, leading to even higher death and disability rates from heart disease and diabetes than we are seeing now,” Dr. Singh said.

**Vit D and allergies**

Curr Opin Allergy Clin Immunol. 2015 Aug;15(4):350-7. doi: 10.1097/ACI.0000000000000177.

**Sunlight, vitamin D and food allergy.**

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Abstract

***PURPOSE OF REVIEW:***

The role of vitamin D in the development of food allergy is unclear. We summarize recent data on the epidemiologic link between sunlight (UVB) and food allergy, and evidence for and against a specific role for vitamin D status.

***RECENT FINDINGS:***

Since 2007, most epidemiologic studies have supported low sunlight (as measured by season of birth and latitude) as a risk factor for food allergy. Investigators have also looked directly at vitamin D status (as measured by serum 25OHD level) and its potential role. Although conflicting, the vitamin D studies suggest a more complicated association than a linear dose response in all individuals, with some studies indicating different associations based on host characteristics (e.g. concomitant eczema, genetic polymorphisms, country of birth). Most studies have not fully examined the myriad effects of sunlight but have instead focused on a single maternal, neonatal or childhood 25OHD level.

***SUMMARY:***

Many studies have linked sunlight with the development of food allergy but whether this is directly related to vitamin D status or a myriad of other sunlight-derived, seasonal and/or geographic factors remains uncertain. More studies are needed to investigate the role of sunlight and vitamin D status in food allergy because of their potential for primary prevention and disease modification.

PMID:26110686

**Black tea/flavonoids and fx risk decrease**

Am J Clin Nutr. 2015 Aug 12. pii: ajcn109892.

**Tea and flavonoid intake predict osteoporotic fracture risk in elderly Australian women: a prospective study.**

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Abstract

**BACKGROUND:**

Observational studies have linked tea drinking, a major source of dietary flavonoids, with higher bone density. However, there is a paucity of prospective studies examining the association of tea drinking and flavonoid intake with fracture risk.

**OBJECTIVE:**

The objective of this study was to examine the associations of black tea drinking and flavonoid intake with fracture risk in a prospective cohort of women aged >75 y.

**DESIGN:**

A total of 1188 women were assessed for habitual dietary intake with a food-frequency and beverage questionnaire. Incidence of osteoporotic fracture requiring hospitalization was determined through the Western Australian Hospital Morbidity Data system. Multivariable adjusted Cox regression was used to examine the HRs for incident fracture.

**RESULTS:**

Over 10 y of follow-up, osteoporotic fractures were identified in 288 (24.2%) women; 212 (17.8%) were identified as a major osteoporotic fracture, and of these, 129 (10.9%) were a hip fracture. In comparison with the lowest tea intake category ( $\leq 1$  cup/wk), consumption of  $\geq 3$  cups/d was associated with a 30% decrease in the risk of any osteoporotic fracture (HR: 0.70; 95% CI: 0.50, 0.96). Compared with women in the lowest tertile of total flavonoid intake (from tea and diet), women in the highest tertile had a lower risk of any osteoporotic fracture (HR: 0.65; 95% CI: 0.47, 0.88), major osteoporotic fracture (HR: 0.66; 95% CI: 0.45, 0.95), and hip fracture (HR: 0.58; 95% CI: 0.36, 0.95). For specific classes of flavonoids, statistically significant reductions with fracture risk were observed for higher intake of flavonols for any osteoporotic fracture and major osteoporotic fracture, as well as flavones for hip fracture ( $P < 0.05$ ).

**CONCLUSION:**

Higher intake of black tea and particular classes of flavonoids were associated with lower risk of fracture-related hospitalizations in elderly women at high risk of fracture.

**KEYWORDS:** bone; cohort; flavonoids; fracture; tea  
PMID:26269364

**OJ and cognition**

Eur J Nutr. 2015 Aug 18.

**Flavonoid-rich orange juice is associated with acute improvements in cognitive function in healthy middle-aged males.**

Alharbi MH<sup>1</sup>, Lamport DJ, Dodd GF, Saunders C, Harkness L, Butler LT, Spencer JP.  
Author information

**Abstract*****PURPOSE:***

Epidemiological evidence suggests that chronic consumption of fruit-based flavonoids is associated with cognitive benefits; however, the acute effects of flavonoid-rich (FR) drinks on cognitive function in the immediate postprandial period require examination. The objective was to investigate whether consumption of FR orange juice is associated with acute cognitive benefits over 6 h in healthy middle-aged adults.

***METHODS:***

Males aged 30-65 consumed a 240-ml FR orange juice (272 mg) and a calorie-matched placebo in a randomized, double-blind, counterbalanced order on 2 days separated by a 2-week washout. Cognitive function and subjective mood were assessed at baseline (prior to drink consumption) and 2 and 6 h post consumption. The cognitive battery included eight individual cognitive tests. A standardized breakfast was consumed prior to the baseline measures, and a standardized lunch was consumed 3 h post-drink consumption.

***RESULTS:***

Change from baseline analysis revealed that performance on tests of executive function and psychomotor speed was significantly better following the FR drink compared to the placebo. The effects of objective cognitive function were supported by significant benefits for subjective alertness following the FR drink relative to the placebo.

***CONCLUSIONS:***

These data demonstrate that consumption of FR orange juice can acutely enhance objective and subjective cognition over the course of 6 h in healthy middle-aged adults.

PMID: 26280945