

## ABSTRACTS

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## 1. LUMBAR SPINE

### Lumbar spine motion

#### Investigating the contribution of the upper and lower lumbar spine, relative to hip motion, in everyday tasks

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- A Significant difference between ROM of LLS and ULS across all movements.
- A significant difference between ULS-hip and LLS-hip ratio for the majority of tasks.
- Significant differences between ULS and LLS velocity for the majority of tasks.

#### Abstract

##### Background

It is commonplace for clinicians to measure range of motion (ROM) in the assessment of the lumbar spine. Traditional single 'joint' models afford measuring only a limited number of regions along the spine and may, therefore, over-simplify the description of movement. It remains to be determined if additional, useful information can be gleaned by considering the traditional 'lumbar region' as two regions.

##### Objective

The aim of this study was to determine whether modelling the lumbar spine as two separate regions (i.e. upper and lower), yields a different understanding of spinal movement relative to hip motion, than a traditional single-joint model. This study is unique in adopting this approach to evaluate a range of everyday tasks.

##### Method

Lumbar spine motion was measured both by being considered as a whole region (S1 to T12), and where the lumbar spine was modelled as two regions (the upper (L3-T12) and lower (S1- L3)).

##### Results

A significant difference was evident between the relative contribution from the lower and upper spine across all movements, with the lower lumbar spine consistently contributing on average 63% of the total ROM. A significant difference was also evident between the whole lumbar spine-hip ratio, and the lower lumbar spine -hip ratio, for the movement of lifting only. The lower lumbar spine achieved greater velocity for all tasks, when compared to the upper lumbar spine.

##### Conclusion

This study has consistently demonstrated differences in the contribution of the upper and lower spinal regions across a range of everyday tasks; hence, it would appear that greater focus should be given to performing more detailed assessments to fully appreciate spinal movement.

##### Keywords:

Lumbar spine, Upper and lower lumbar spine, Lumbar-hip movement, Sectioned approach, Ratio, Velocity

## 5. SURGERY

### Stenosis surgery

Clin Neurol Neurosurg. 2015 Sep 16;139:86-90. doi: 10.1016/j.clineuro.2015.09.009.

#### **Effects of minimally invasive decompression surgery on quality of life in older patients with spinal stenosis.**

Dagistan Y<sup>1</sup>, Dagistan E<sup>2</sup>, Gezici AR<sup>3</sup>, Cancan SE<sup>3</sup>, Bilgi M<sup>4</sup>, Cakir U<sup>5</sup>.  
Author information

Abstract

#### **OBJECTIVES:**

Lumbar spinal stenosis (LSS) in the elderly may result in a progressive narrowing of the spinal canal leading to compression of nerve roots in some individuals. The aim of this study was to evaluate the quality of life changes after minimally invasive decompression surgery without instrumentation in geriatric patients with lumbar spinal stenosis.

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

This prospective clinical study included 37 patients with American Society of Anesthesiologists (ASA) II-III scores between the ages of 65 and 86 years, who were planned to undergo surgical intervention due to LSS. All patients had neurogenic claudication and pain in the hips, thighs, and legs. Measurements of the osseous spinal canal were evaluated by magnetic resonance imaging. Before the surgical intervention, patient demographics and clinical characteristics were recorded. The Short-Form-36 test, the Oswestry Disability Index, and the Visual Analog Scale were applied to all patients preoperatively and two years postoperatively.

#### **RESULTS:**

In the study population, 11 patients had single level of spinal stenosis, 20 patients had two levels of spinal stenosis, and six patients had three levels of spinal stenosis. There were significant differences between the preoperative and postoperative ODI and VAS scores. There was a statistically significant difference in all subscales of the SF-36 test with the exception of general health scores. Three patients who had dural damage during the operation were treated with bio glue. Also, no patients were recorded to have any neurological deficits and root injuries postoperatively.

#### **CONCLUSION:**

Minimally invasive decompression surgery, without instrumentation, for lumbar spinal stenosis in geriatric patients significantly improves the patients' quality of life.

**KEYWORDS:** Geriatric patients; Lumbar spinal stenosis; Minimally invasive decompression; Quality of life  
PMID: 26397214

## 6. PELVIC GIRDLE

### Sacral angle and lordosis and facet djd

Spine (Phila Pa 1976). 2015 Oct 1;40(19):E1058-62. doi: 10.1097/BRS.0000000000001070.

#### **The Relationship Between Osteoarthritis of the Lumbar Facet Joints and Lumbosacropelvic Morphology.**

Sahin MS<sup>1</sup>, Ergün A, Aslan A.  
Author information

Abstract

#### **STUDY DESIGN:**

Cross-sectional study.

#### **OBJECTIVE:**

To investigate the relation between lumbosacropelvic morphology and the presence and degree of facet joint degeneration.

#### **SUMMARY OF BACKGROUND DATA:**

Osteoarthritis of the facet joints is one of the most common degenerative changes in the spine. It is considered to be formed secondary to repetitive stress or trauma and spinal deformity with secondary overload. The cause(s) of facet joints osteoarthritis, however, have not been clearly identified.

#### **METHODS:**

Abdominal computed tomography (CT) images of 723 patients which were taken between the years 2010 and 2014 were evaluated retrospectively. Patients with prior lumbar spinal surgery, serious congenital anomalies on CT, incomplete or complete lumbosacral transition, severe scoliosis, were excluded from the study. To eliminate the age- and sex-related differences in spinopelvic morphology, a study group was formed of the remaining subjects by including patients from a specific age group (30-35 yr) and same sex (females). For each patient the presence and grade of facet joint degeneration was investigated. In addition, pelvic incidence (PI), sacral slope and the angles of L1-L5 lumbar lordosis, sacral table, L5 vertebra posterior, and sacral kyphosis were measured for each patient.

#### **RESULTS:**

Sacral slope, sacral kyphosis, and L1-L5 lumbar lordosis angle were significantly higher in patients with osteoarthritic compared with normal subjects ( $P = 0.015$ ,  $P = 0.018$ ,  $P = 0.016$ ). L5 vertebra posterior and sacral table angle were found to be significantly lower in patients with osteoarthritic than in normal subjects ( $P = 0.019$ ,  $P = 0.007$ ). The degree of facet joint degeneration was noticed to increase parallel to the decrease in the sacral table angle and L5 vertebra posterior angle, and to the increase in the L1-L5 lumbar lordosis, PI, and sacral slope.

#### **CONCLUSION:**

A close relation exists between the presence and degree of degeneration in the facet joint and lumbosacral pelvic morphology. Prevalence and degree of the degeneration in facet joint increases as the angle of sacral slope, L1-L5 lumbar lordosis, and PI increases or the angle of sacral table and L5 vertebra posterior decreases.

#### **LEVEL OF EVIDENCE: 4.**

PMID:2623053

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Exercise decreases pregnancy pelvic pain

Br J Sports Med. 2015 Oct 4. pii: bjsports-2015-094921. doi: 10.1136/bjsports-2015-094921.

#### **Exercise level before pregnancy and engaging in high-impact sports reduce the risk of pelvic girdle pain: a population-based cohort study of 39 184 women.**

Owe KM<sup>1</sup>, Bjelland EK<sup>2</sup>, Stuge B<sup>3</sup>, Orsini N<sup>4</sup>, Eberhard-Gran M<sup>5</sup>, Vangen S<sup>6</sup>.  
Author information

Abstract

#### **OBJECTIVE:**

To examine whether an association exists between exercise levels pre-pregnancy and pelvic girdle pain in pregnancy. Pelvic girdle pain in pregnancy has been associated with physical inactivity, a risk factor for adverse pregnancy outcomes.

#### **METHODS:**

We used data from a population-based cohort study including 39 184 nulliparous women with a singleton pregnancy enrolled in the Norwegian Mother and Child Cohort study. Pre-pregnancy exercise frequency and types were assessed by questionnaire in pregnancy week 17. Pelvic girdle pain, defined as combined pain in the anterior pelvis and in the posterior pelvis bilaterally, was self-reported in pregnancy week 30. Multivariable Poisson regression estimated risks of pelvic girdle pain associated with pre-pregnancy exercise. We examined a dose-response association of prepregnancy exercise frequency using restricted cubic splines. A test for non-linearity was also conducted. Final models were adjusted for pre-pregnancy BMI, age, education, history of low back pain and history of depression.

#### **RESULTS:**

4069 women (10.4%) reported pelvic girdle pain in pregnancy and the prevalence among women who were non-exercisers prepregnancy was 12.5%. There was a non-linear association for pre-pregnancy exercise and risk of pelvic girdle pain (test for non-linearity,  $p=0.003$ ). Compared to non-exercisers, women exercising 3-5 times weekly pre-pregnancy had a 14% lower risk of developing pelvic girdle pain in pregnancy (aRR 0.86, 95% CI 0.77 to 0.96). Taking part in high-impact exercises such as running, jogging, orienteering, ballgames, netball games and high-impact aerobics were associated with less risk of pelvic girdle pain.

#### **SUMMARY:**

Women who exercise regularly and engage in high-impact exercises before the first pregnancy may have a reduced risk of pelvic girdle pain in pregnancy.

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**KEYWORDS:** Exercise; Pelvis; Pregnancy; Prospective; Sports & exercise medicine  
PMID:26435533

**8. VISCERA****IBS Vit. D**

J Pediatr Gastroenterol Nutr. 2015 Oct;61(4):411-4. doi: 10.1097/MPG.0000000000000823.

**Single High-Dose Oral Vitamin D3 Therapy (Stoss): A Solution to Vitamin D Deficiency in Children With Inflammatory Bowel Disease?**

Shepherd D1, Day AS, Leach ST, Lopez R, Messenger R, Woodhead HJ, Ledder O, Lemberg DA.

Author information

Abstract

**OBJECTIVES:**

Vitamin D deficiency is common in children with inflammatory bowel disease (IBD). The aim of this study was to determine the safety and efficacy of stoss therapy on vitamin D levels during a period of 6 months in children with IBD and vitamin D deficiency (<50 nmol/L).

**METHODS:**

A retrospective chart review was undertaken, focusing upon children managed in the IBD clinic at Sydney Children's Hospital between 2006 and 2010. Those with a 25-hydroxyvitamin D (25-OHD) level <50 nmol/L and those who received stoss therapy were included in this study.

**RESULTS:**

A total of 76 children received stoss therapy. There was a significant and sustained increase in 25-OHD levels at all of the time points compared with baseline ( $40.8 \pm 7.5$  nmol/L), 1 month ( $145.6 \pm 51.8$  nmol/L), 3 months ( $87.1 \pm 28.4$  nmol/L), and 6 months ( $69.2 \pm 31.3$  nmol/L). There were no significant changes in serum calcium, phosphate, or parathyroid hormone at any time points.

**CONCLUSIONS:**

Stoss therapy safely and effectively achieved and maintained a level of 25-OHD >50 nmol/L during 6 months in these children with IBD. Further prospective studies are now required to confirm this finding and establish whether this intervention has other benefits.

PMID:25883058

**IBS coping strategies**

J Pediatr Gastroenterol Nutr. 2015 Oct;61(4):431-6. doi: 10.1097/MPG.0000000000000841.

**Role of Coping With Symptoms in Depression and Disability: Comparison Between Inflammatory Bowel Disease and Abdominal Pain.**

van Tilburg MA<sup>1</sup>, Claar RL, Romano JM, Langer SL, Walker LS, Whitehead WE, Abdullah B, Christie DL, Levy RL.

Author information

Abstract

**BACKGROUND:**

Inflammatory bowel disease (IBD) and abdominal pain of functional origin (AP) are common gastrointestinal disorders in children, which are associated with increased risk for depression and disability. Both symptom severity and coping with symptoms may contribute to these outcomes. We hypothesized that children with AP use different coping strategies compared with those with IBD for a number of reasons, including the fact that fewer treatment options are available to them. We also examined whether coping was related to depression and functional disability beyond the contributions of symptom severity.

**METHODS:**

The study method included secondary data analysis of 2 existing data sets including 200 children with AP (73% girls, mean age 11.2 years) and 189 children with IBD (49% girls, mean age 13.8 years).

**RESULTS:**

Compared with patients with IBD, patients with AP reported more use of coping strategies of self-isolation, behavioral disengagement, and catastrophizing, as well as problem solving and seeking social support. Multivariate analyses revealed that, in both samples,  $\geq 1$  coping strategies were associated with depression and functional disability, independent of symptom severity, and controlling for age and sex. In IBD, symptoms were not a significant predictor of depression but coping was. Catastrophizing predicted depression and disability in both samples.

**CONCLUSIONS:**

Patients with AP report more frequent use of several of the coping strategies we measured compared with patients with IBD. Certain types of coping, particularly catastrophizing, were associated with greater depression and functional disability in both groups. Clinicians should be aware of maladaptive coping, which may be a risk factor for poor psychosocial and functional outcomes in both patient groups.

PMID:25944213

**10 A. CERVICAL SPINE****Posture in elderly**

Spine (Phila Pa 1976). 2015 Oct 1;40(19):1487-94. doi: 10.1097/BRS.0000000000001071.

**The Influence of Age and Sex on Cervical Spinal Alignment Among Volunteers Aged Over 50.**

Oe S<sup>1</sup>, Togawa D, Nakai K, Yamada T, Arima H, Banno T, Yasuda T, Kobayasi S, Yamato Y, Hasegawa T, Yoshida G, Matsuyama Y.

Author information

Abstract

**STUDY DESIGN:**

Large cohort study of volunteers aged over 50.

**OBJECTIVE:**

To investigate influence of age and sex on cervical sagittal alignment among volunteers aged over 50.

**SUMMARY OF BACKGROUND DATA:**

Few large-scale studies have described normative values in cervical spine alignment regarding age and sex among volunteers aged over 50.

**METHODS:**

The study cohort included 656 volunteers aged 50 to 89 years. Pelvic tilt, sacral slope, pelvic incidence, lumbar lordosis, pelvic incidence-lumbar lordosis, thoracic kyphosis, T1 slope (T1S), cervical lordosis (CL), C7 sagittal vertical axis (C7 SVA), C2-C7 SVA, and T1S-CL were measured using whole spine and pelvic radiographs taken in the standing position. Health-related quality of life was assessed using the EuroQOL (EQ-5D) standardized instrument for measurement of health outcome and Oswestry Disability Index.

**RESULTS:**

There were 36 subjects aged 50 to 59 years, 174 aged 60 to 69 years, 311 aged 70 to 79 years, and 135 aged 80 to 89 years. Average T1S for each decade was 32°, 31°, 33°, and 36° for males, and 28°, 29°, 32°, and 37° for females, respectively. Average C2-C7 SVA was 25, 28, 34, and 35 mm for males, and 20, 21, 22, and 28 mm for females, respectively. C2-C7 SVA 40 mm or more, T1S 40° or more, and T1S-CL 20° or more pertaining to EQ-5D were significantly worse in other cases.

**CONCLUSION:**

C2-C7 SVA was significantly greater in males among all age groups, particularly among those with C2-C7 SVA of 40 mm or more [males, 69% (82/118) vs. females, 33% (36/118)]. Sagittal parameters of cervical spine were significantly worse in males than females. C2-C7 SVA, T1S, and T1S-CL negatively influenced EQ-5D. These results help to explain the greater prevalence of cervical spondylotic myelopathy among elderly males.

**LEVEL OF EVIDENCE:**

3.

PMID: 26208229



**CBT and chronic neck pain**

Spine (Phila Pa 1976). 2015 Oct 1;40(19):1495-504. doi: 10.1097/BRS.0000000000001052.

**Cognitive-behavioral Treatment for Subacute and Chronic Neck Pain: A Cochrane Review.**

Monticone M<sup>1</sup>, Ambrosini E, Cedraschi C, Rocca B, Fiorentini R, Restelli M, Gianola S, Ferrante S, Zanolli G, Moja L.

Author information

Abstract

**STUDY DESIGN:**

Systematic review of randomized-controlled trials (RCTs).

**OBJECTIVE:**

To assess the effects of cognitive-behavioral therapy (CBT) on neck pain (NP).

**SUMMARY OF BACKGROUND DATA:**

Although research on nonpharmacological and nonsurgical treatments for NP is progressing, there remains uncertainty about the efficacy of CBT.

**METHODS:**

We searched electronic databases for RCTs. We included RCTs assessing the use of CBT on adults with subacute and chronic NP. 2 independent reviewers extracted data on pain (primary outcome), disability, psychological indicator, and quality of life. We calculated standardized mean differences and 95% confidence intervals. We used the Cochrane Collaboration's tool to assess risk of bias and the GRADE approach to evaluate the quality of evidence and summarize conclusions.

**RESULTS:**

We included 10 studies (836 participants), 4 at low risk of bias. With regard to chronic NP, there was low quality evidence that CBT was better than no treatment for improving pain, disability, and quality of life, whereas no effect was found on kinesiophobia. The clinical importance of these benefits is uncertain. When comparing both CBT to other interventions and CBT in addition to another intervention to the other intervention alone, no difference was found for pain and disability, whereas a positive effect was achieved for kinesiophobia only when comparing CBT with other interventions. On subacute NP, CBT was found to be better than other interventions for pain, whereas no difference was found for secondary outcomes.

**CONCLUSION:**

CBT was shown to induce changes on pain and disability for chronic NP only when compared with no treatment. On subacute NP, benefit was found on pain relief but not on disability when comparing CBT with other interventions. However, none of these effects were clinically meaningful. Due to the low quality of the evidence, our conclusions might change over time whereas new data are available.

**LEVEL OF EVIDENCE: 1.**

PMID:26192729

**Orthosis for restricting C spine motion**

Spine (Phila Pa 1976). 2015 Oct 1;40(19):E1046-51. doi: 10.1097/BRS.0000000000001013.

**Effectiveness of Adjustable Cervical Orthoses and Modular Cervical Thoracic Orthoses in Restricting Neck Motion: A Comparative In vivo Biomechanical Study.**

Gao F<sup>1</sup>.

Author information

Abstract

**STUDY DESIGN:**

In vivo biomechanical study.

**OBJECTIVE:**

To compare the effectiveness of adjustable cervical orthoses (COs) and modular cervical thoracic orthoses (CTOs) with standard devices in restricting neck motion in all 3 anatomical planes.

**SUMMARY OF BACKGROUND DATA:**

No literature is available regarding the effectiveness of adjustable COs and modular CTOs in restricting neck motion, and existing in vivo evaluation methodologies lack consistency and objectivity.

**METHODS:**

The effectiveness of adjustable COs (Vista collar and Vista multipost collar) and modular CTOs (Vista TS, Vista TS with multipost, and Vista TS4 with multipost) in comparison with standard devices (Aspen collar [AC] and Aspen cervical thoracic orthosis) in restricting neck motion across 3 anatomical planes was studied in vivo in 27 healthy participants across prescribed loading levels ranging from 0.5 to 2.0 N·m. Neck range of motion allowed was compared between devices using Tukey post hoc test. The compliance of devices in restricting flexion and extension was obtained via a linear regression model.

**RESULTS:**

When compared with modular CTOs, Aspen CTO was significantly more effective at motion restriction in both sagittal and frontal planes under loading level higher than 1.5 N·m. Modular CTOs outperformed adjustable COs in most of the cases but were fairly comparable with the standard CO (i.e., AC). Adjustable COs were just as effective as standard COs. The compliances of devices in restricting neck flexion ranked in ascending order were 0.83 (Aspen CTO), 1.53 (Vista TS with multipost), 1.60 (Vista TS4 with multipost), 1.77 (Vista multipost collar), 1.78 (AC), 1.99 (Vista TS), and 2.43 (Vista Collar) degrees per N·m.

**CONCLUSION:**

Overall, modular CTOs had poorer performance in neck restriction than their standard counterpart (ACTO), whereas adjustable COs showed overall comparable performance to their standard counterpart (AC). The outcomes may assist clinicians in selecting appropriate devices.

**LEVEL OF EVIDENCE:**

N/A.

PMID: 26076435

**12 A. WHIPLASH****Eye pursuit**

Spine (Phila Pa 1976). 2015 Oct 1;40(19):E1052-7. doi: 10.1097/BRS.0000000000001016.

**Smooth Pursuit Eye Movement Deficits in Patients With Whiplash and Neck Pain are Modulated by Target Predictability.**

Janssen M<sup>1</sup>, Ischebeck BK, de Vries J, Kleinrensink GJ, Frens MA, van der Geest JN.  
Author information

Abstract

**STUDY DESIGN:**

This is a cross-sectional study.

**OBJECTIVE:**

The purpose of this study is to support and extend previous observations on oculomotor disturbances in patients with neck pain and whiplash-associated disorders (WADs) by systematically investigating the effect of static neck torsion on smooth pursuit in response to both predictably and unpredictably moving targets using video-oculography.

**SUMMARY OF BACKGROUND DATA:**

Previous studies showed that in patients with neck complaints, for instance due to WAD, extreme static neck torsion deteriorates smooth pursuit eye movements in response to predictably moving targets compared with healthy controls.

**METHODS:**

Eye movements in response to a smoothly moving target were recorded with video-oculography in a heterogeneous group of 55 patients with neck pain (including 11 patients with WAD) and 20 healthy controls. Smooth pursuit performance was determined while the trunk was fixed in 7 static rotations relative to the head (from 45° to the left to 45° to right), using both predictably and unpredictably moving stimuli.

**RESULTS:**

Patients had reduced smooth pursuit gains and smooth pursuit gain decreased due to neck torsion. Healthy controls showed higher gains for predictably moving targets compared with unpredictably moving targets, whereas patients with neck pain had similar gains in response to both types of target movements. In 11 patients with WAD, increased neck torsion decreased smooth pursuit performance, but only for predictably moving targets.

**CONCLUSION:**

Smooth pursuit of patients with neck pain is affected. The previously reported WAD-specific decline in smooth pursuit due to increased neck torsion seems to be modulated by the predictability of the movement of the target. The observed oculomotor disturbances in patients with WAD are therefore unlikely to be induced by impaired neck proprioception alone.

**LEVEL OF EVIDENCE: 3.**

PMID:26418634

### 13. CRANIUM/TMJ

#### Nutrition and periodontal disease

J Nutr. 2015 Sep 30. pii: jn211524.

#### Higher Intakes of Fruits and Vegetables, $\beta$ -Carotene, Vitamin C, $\alpha$ -Tocopherol, EPA, and DHA Are Positively Associated with Periodontal Healing after Nonsurgical Periodontal Therapy in Nonsmokers but Not in Smokers.

Dodington DW<sup>1</sup>, Fritz PC<sup>2</sup>, Sullivan PJ<sup>1</sup>, Ward WE<sup>3</sup>.

Author information

Abstract

##### **BACKGROUND:**

Periodontitis is a chronic inflammatory disease and a significant risk factor for tooth loss. Although a link between diet and periodontal health exists, the relation between diet and healing after periodontal therapy has yet to be investigated.

##### **OBJECTIVE:**

The objective was to determine whether higher intakes of fruits and vegetables or nutrients with antioxidant or anti-inflammatory activity are associated with greater healing, measured as reduced probing depth (PD), after scaling and root planing (SRP), a cost-effective treatment to manage periodontal disease and prevent tooth loss.

##### **METHODS:**

Patients (63 nonsmokers, 23 smokers) with chronic generalized periodontitis who were undergoing SRP participated. Healing was evaluated based on PD, assessed at baseline and 8-16 wk after SRP. Intakes of fruits, vegetables,  $\beta$ -carotene, vitamin C,  $\alpha$ -tocopherol,  $\alpha$ -linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) were estimated using the Block 2005 food frequency questionnaire and a supplement questionnaire. Serum 25-hydroxyvitamin D concentrations were also measured. PD (% sites  $>3$  mm) was modeled in multiple linear regression and analysis of covariance by tertile of intake and adjusted for age, sex, body mass index (BMI), baseline PD, examiner, gingival bleeding, and study duration.

##### **RESULTS:**

In nonsmokers, PD was associated with fruit and vegetable,  $\beta$ -carotene, vitamin C,  $\alpha$ -tocopherol, EPA, and DHA intake ( $P < 0.05$ ). PD was not significantly associated with ALA intake or serum 25-hydroxyvitamin D concentrations. Significant associations that included supplements ( $\beta$ -carotene, vitamin C,  $\alpha$ -tocopherol) were attenuated or lost, depending on the statistical model used. There were no significant associations within the group of smokers.

##### **CONCLUSIONS:**

Dietary intakes of fruits, vegetables,  $\beta$ -carotene, vitamin C,  $\alpha$ -tocopherol, EPA, and DHA are associated with reduced PD after SRP in nonsmokers, but not smokers, with chronic generalized periodontitis. These findings may lead to the development of dietary strategies to optimize healing after periodontal procedures. This trial was registered at [clinicaltrials.gov](http://clinicaltrials.gov) as NCT02291835.

**KEYWORDS:** anti-inflammatory; antioxidants; bone; healing; oral health; periodontal health; tooth retention

PMID: 26423734

**Molars**

Eur J Orthod. 2015 Sep 18. pii: cjv067.

**Influence of maxillary posterior discrepancy on upper molar vertical position and facial vertical dimensions in subjects with or without skeletal open bite.**

Arriola-Guillén LE<sup>1</sup>, Aliaga-Del Castillo A<sup>2</sup>, Pérez-Vargas LF<sup>3</sup>, Flores-Mir C<sup>4</sup>.  
Author information

Abstract

**OBJECTIVES:**

To determine the influence of maxillary posterior discrepancy on upper molar vertical position and dentofacial vertical dimensions in individuals with or without skeletal open bite (SOB).

**MATERIALS AND METHODS:**

Pre-treatment lateral cephalograms of 139 young adults were examined. The sample was divided into eight groups categorized according to their sagittal and vertical skeletal facial growth pattern and maxillary posterior discrepancy (present or absent). Upper molar vertical position, overbite, lower anterior facial height and facial height ratio were measured. Independent t-test was performed to determine differences between the groups considering maxillary posterior discrepancy. Principal component analysis and MANCOVA test were also used.

**RESULTS:**

No statistically significant differences were found comparing the molar vertical position according to maxillary posterior discrepancy for the SOB Class I group or the group with adequate overbite. Significant differences were found in SOB Class II and Class III groups. In addition, an increased molar vertical position was found in the group without posterior discrepancy.

**LIMITATIONS:**

Some variables closely related with the individual's intrinsic craniofacial development that could influence the evaluated vertical measurements were not considered.

**CONCLUSIONS AND IMPLICATIONS:**

Overall maxillary posterior discrepancy does not appear to have a clear impact on upper molar vertical position or facial vertical dimensions. Only the SOB Class III group without posterior discrepancy had a significant increased upper molar vertical position.

PMID:26385786

## Quality of life

Eur J Orthod. 2015 Oct;37(5):481-90. doi: 10.1093/ejo/cju076. Epub 2014 Dec 5.

**Relationships between dental appearance, self-esteem, socio-economic status, and oral health-related quality of life in UK schoolchildren: A 3-year cohort study.**

Benson PE<sup>1</sup>, Da'as T<sup>2</sup>, Johal A<sup>3</sup>, Mandall NA<sup>4</sup>, Williams AC<sup>5</sup>, Baker SR<sup>6</sup>, Marshman Z<sup>7</sup>.  
Author information

## Abstract

**OBJECTIVES:**

To examine the relationships between dental appearance, characteristics of the individual and their environment, and oral health-related quality of life (OHQoL) in young people over time.

**METHODS:**

A total of 374 young people (122 boys, 252 girls) aged 11-12 years from seven different XX schools were recruited at baseline and 258 (78 boys, 180 girls) followed-up 3 years later, aged 14-15 years (69 per cent response rate). Participants completed a measure of OHQoL (CPQ11-14 ISF-16) and self-esteem (SE, CHQ-CF87). A clinical examination was undertaken, including clinician and self-assessed normative measures of need [Index of Orthodontic Treatment Need (IOTN)] and dental caries. The Index of Multiple Deprivation was used to indicate socio-economic status (SES).

**RESULTS:**

There was a general improvement between baseline and follow-up in the measures of malocclusion, as well as OHQoL. Multiple linear regression indicated that there were significant cross-sectional associations at baseline between OHQoL and SES ( $\rho = -0.11$ ;  $P = 0.006$ ), SE ( $\rho = -0.50$ ;  $P < 0.001$ ), and self-assessed IOTN ( $\rho = 0.27$ ;  $P < 0.001$ ). There were significant longitudinal associations between the change in OHQoL and change in SE ( $\rho = -0.46$ ;  $P < 0.001$ ) and change in the decayed, missing, or filled surfaces ( $\rho = -0.24$ ;  $P = 0.001$ ). The mean improvement in the total CPQ11-14 ISF-16 score for those with a history of orthodontic treatment was 3.2 (SD = 6.9;  $P = 0.009$ ) and 2.4 (SD = 8.8;  $P < 0.001$ ) for those with no history of treatment. The difference was not statistically significant ( $P = 0.584$ ).

**CONCLUSIONS:**

OHQoL improved in young people over time, whether they gave a history of orthodontic treatment or not. Individual and environmental characteristics influence OHQoL and should be taken into account in future studies.

PMID:25481920

**Suture mobility**

Orthod Craniofac Res. 2015 Sep 28. doi: 10.1111/ocr.12106.

**Viscoelastic response of the midpalatal suture during maxillary expansion treatment.**

Romanyk DL<sup>1</sup>, Shim C<sup>1</sup>, Liu SS<sup>2</sup>, Lagravere MO<sup>3</sup>, Major PW<sup>3</sup>, Carey JP<sup>1</sup>.

Author information

Abstract

**OBJECTIVES:**

The viscoelastic response of the midpalatal suture during maxillary expansion treatment has been sparsely studied. The aim of our study was to use viscoelastic models to investigate the effect of appliance mechanics on sutural tissue.

**MATERIALS AND METHODS:**

Four creep-strain models were utilized in predicting the midpalatal suture's response to a constant-force application during expansion treatment. The functional forms included a three-term separable, three-term inseparable, two-term inseparable, and single-term arrangement. The functions were then transformed into subsequent stress-relaxation representations to predict suture response as a result of 0.25, 0.20, 0.15, and 0.10 mm displacements. Finally, the single-term creep-strain representation was altered to simulate treatment decaying force during treatment. A force that decays 30 and 10% of an initially applied 0.98 N was considered for decaying functions over a 6-week period, and compared to strain resulting from a constant-force application.

**RESULTS:**

This analysis illustrated that the decay in suture strain closely followed decay in force and that the path of decay had minimal impact on overall results. Also, it was found that a single screw activation would likely not cause suture soft tissue failure, even for a 0.25 mm displacement, and that suture stress rapidly decayed within minutes of activation.

**CONCLUSION:**

Results from this study support the notion of maintaining a low-magnitude constant traction on the suture during treatment to avoid soft tissue failure and promote tissue remodeling.

**KEYWORDS:** biomedical engineering; maxillary expansion; midpalatal suture; orthodontics; viscoelastic

PMID:26412045

## 14. HEADACHES

### Brain changes

Neuroradiology. 2015 Oct 7.

#### **Detection of changes in the periaqueductal gray matter of patients with episodic migraine using quantitative diffusion kurtosis imaging: preliminary findings.**

Ito K<sup>1</sup>, Kudo M<sup>2</sup>, Sasaki M<sup>3</sup>, Saito A<sup>2</sup>, Yamashita F<sup>3</sup>, Harada T<sup>4</sup>, Yokosawa S<sup>5</sup>, Uwano I<sup>3</sup>, Kameda H<sup>3</sup>, Terayama Y<sup>2</sup>.

Author information

Abstract

#### **INTRODUCTION:**

The periaqueductal gray matter (PAG) is considered to play an important role in generating migraine, but findings from imaging studies remain unclear. Therefore, we investigated whether diffusion kurtosis imaging (DKI) can detect changes in the PAG of migraine patients.

#### **METHODS:**

We obtained source images for DKI from 20 patients with episodic migraine and 20 healthy controls using a 3 T magnetic resonance imaging scanner. Mean kurtosis (MK), fractional anisotropy (FA), and mean diffusivity (MD) maps were generated, and the values of the PAG and other deep gray and white matter structures were automatically measured using an atlas-based region-of-interest analysis. The metrics of these structures were compared between the patients and controls.

#### **RESULTS:**

The MK and MD values of the PAG were significantly increased in the migraine patients compared with the controls ( $p < 0.05$ ). The FA values were not significantly different. There were no significant differences in the metrics of the other structures between the patients and controls. The MK values of the PAG were significantly positively correlated with both age and the untreated period in the patient group under univariate analysis ( $r = 0.53$  and  $0.56$ , respectively;  $p < 0.05$ ) but not multivariate analysis.

#### **CONCLUSIONS:**

DKI detected significant increases in the MK and MD values of the PAG in patients with migraine, which suggests that structural changes in the PAG are associated with the pathophysiological mechanisms of migraine.

**KEYWORDS:** Diffusion kurtosis imaging; Headache; Migraine; Periaqueductal gray matter  
PMID:26446146



**Lateral inhibition**

Cephalalgia. 2015 Oct 6. pii: 0333102415610873.

**Lateral inhibition in the somatosensory cortex during and between migraine without aura attacks: Correlations with thalamocortical activity and clinical features.**

Coppola G<sup>1</sup>, Bracaglia M<sup>2</sup>, Di Lenola D<sup>2</sup>, Iacovelli E<sup>2</sup>, Di Lorenzo C<sup>3</sup>, Serrao M<sup>2</sup>, Evangelista M<sup>4</sup>, Parisi V<sup>5</sup>, Schoenen J<sup>6</sup>, Pierelli F<sup>7</sup>.

Author information

Abstract

**BACKGROUND:**

We studied lateral inhibition in the somatosensory cortex of migraineurs during and between attacks, and searched for correlations with thalamocortical activity and clinical features.

**PARTICIPANTS AND METHODS:**

Somatosensory evoked potentials (SSEP) were obtained by electrical stimulation of the right median (M) or ulnar (U) nerves at the wrist or by simultaneous stimulation of both nerves (MU) in 41 migraine without aura patients, 24 between (MO), 17 during attacks, and in 17 healthy volunteers (HVs). We determined the percentage of lateral inhibition of the N20-P25 component by using the formula  $[(100)-MU/(M + U)*100]$ . We also studied high-frequency oscillations (HFOs) reflecting thalamocortical activation.

**RESULTS:**

In migraine, both lateral inhibition (MO 27.9% vs HVs 40.2%;  $p = 0.009$ ) and thalamocortical activity (MO 0.5 vs HVs 0.7;  $p = 0.02$ ) were reduced between attacks, but not during. In MO patients, the percentage of lateral inhibition negatively correlated with days elapsed since the last migraine attack ( $r = -0.510$ ,  $p = 0.01$ ), monthly attack duration ( $r = -0.469$ ,  $p = 0.02$ ) and severity ( $r = -0.443$ ,  $p = 0.03$ ), but positively with thalamocortical activity ( $r = -0.463$ ,  $p = 0.02$ ).

**CONCLUSIONS:**

We hypothesize that abnormal migraine cycle-dependent dynamics of connectivity between subcortical and cortical excitation/inhibition networks may contribute to clinical features of MO and recurrence of attacks.

**KEYWORDS:** Migraine; clinical features; evoked potentials; lateral inhibition; thalamocortical activity

PMID:26442930

**Central impact of Migraine**

Cephalalgia. 2015 Oct 6. pii: 0333102415610873. [Epub ahead of print]

**Lateral inhibition in the somatosensory cortex during and between migraine without aura attacks: Correlations with thalamocortical activity and clinical features.**

Coppola G<sup>1</sup>, Bracaglia M<sup>2</sup>, Di Lenola D<sup>2</sup>, Iacovelli E<sup>2</sup>, Di Lorenzo C<sup>3</sup>, Serrao M<sup>2</sup>, Evangelista M<sup>4</sup>, Parisi V<sup>5</sup>, Schoenen J<sup>6</sup>, Pierelli F<sup>7</sup>.

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**CONCLUSIONS:**

We hypothesize that abnormal migraine cycle-dependent dynamics of connectivity between subcortical and cortical excitation/inhibition networks may contribute to clinical features of MO and recurrence of attacks.

**KEYWORDS:** Migraine; clinical features; evoked potentials; lateral inhibition; thalamocortical activity

PMID:26442930

## 16. CONCUSSIONS

### Awareness of concussions

#### Concussions misunderstood and feared by most Americans

UPMC, 10/06/2015

The national survey of 2,012 Americans age 18 and over was conducted in April by Harris Poll on behalf of UPMC. The survey further showed that, despite a lack of knowledge and understanding, there is a high level of concern and even fear across the country.

A fear of concussions may be impacting parents' decisions to let their kids play contact sports

- 9 in 10 (89 percent) adults believe concussions are a moderate to severe health concern
- About 1 in 3 (32 percent) of parents live in fear that their child will get a concussion
- 1 in 4 (25 percent) of parents do not let their kids play some contact sports because of fear of concussion
- 2 in 5 (41 percent) adults feel that getting a concussion is a “living nightmare”

Many Americans (57 percent) have personal experience with concussions

- About 1 in 4 (26 percent) adults did not see a health care professional when someone in their family had one

The vast majority of adults can't correctly define a concussion

- Roughly 9 in 10 (87 percent) Americans do not know the definition of a concussion
- 2 in 5 (37 percent) adults admit that they are confused about what a concussion truly is

There are varying degrees of knowledge when it comes to understanding the symptoms of concussion

- Slightly fewer than 3 in 5 adults can correctly identify immediate symptoms of a concussion: headache (58 percent), dizziness/motion sensitivity (58 percent), and cognitive difficulty (55 percent)
- Far fewer – roughly 1 in 3 or less – understand that the following also are symptoms: fatigue (34 percent) and changes in mood (13 percent)

The majority of Americans do not realize that concussions are treatable

- Barely 1 in 4 (29 percent) of Americans believe that all concussions can be treated
- 79 percent of adults incorrectly believe or are unsure that there is no real way to cure a concussion; the symptoms can only be lessened
- About 4 in 5 (81 percent) Americans aren't comfortable that they would know the steps to manage or treat a concussion if they sustained one

The majority of Americans (83 percent) feel that major progress has been made in the past 10 years in assessing and treating concussions

- Only 1 in 2 (49 percent) adults know that a person does not need to stay awake for 24 hours after sustaining a concussion
- 8 in 10 (83 percent) adults believe people generally do not take concussions seriously enough

**Adolescent concussion**

Br J Sports Med. 2015 Oct 1. pii: bjsports-2015-094663. doi: 10.1136/bjsports-2015-094663. [

**Cognitive and physical symptoms of concussive injury in children: a detailed longitudinal recovery study.**

Crowe L<sup>1</sup>, Collie A<sup>2</sup>, Hearps S<sup>3</sup>, Dooley J<sup>1</sup>, Clausen H<sup>4</sup>, Maddocks D<sup>5</sup>, McCrory P<sup>6</sup>, Davis G<sup>7</sup>, Anderson V<sup>1</sup>.

Author information

Abstract

**BACKGROUND:**

Recovery from concussion sustained in childhood and adolescence is poorly understood. We explored patterns of recovery for neurocognition and postconcussive symptoms following concussion in children and adolescents.

**METHODS:**

Using a prospective, longitudinal design, we collected baseline data on 728 children and adolescents aged 10-17 years. 10 participants sustained a concussive injury (n=10) in the 12 months following baseline testing and they were reviewed at day 5, 10 and 30 postconcussion. Assessments included the CogSport for Kids computerised test battery to evaluate neurocognitive function and self-report, and parent measures of postconcussive symptoms. At day 30, parents also completed measures rating their child's quality of life and executive functions.

**RESULTS:**

Children and adolescents displayed a gradual reduction in postconcussive symptoms over the 30 days following injury. At day 5, 87% of participants were reporting physical and cognitive symptoms, with a generalised reduction in all symptoms by day 10 (40% of participants). On the computerised measure, reaction time was slower after concussion, but returned to baseline levels by day 30. At day 30, 10% of participants demonstrated ongoing postconcussive symptoms. Number of previous concussions was related to speed of symptom resolution.

**CONCLUSIONS:**

At 5 days postconcussion, the majority of children and adolescents experienced debilitating postconcussive symptoms. However, by 30 days postinjury, 90% demonstrated recovery to normal for both neurocognition and postconcussive symptoms.

PMID:26429808

**19. GLENOHUMERAL/SHOULDER****Axial rotation**

J Shoulder Elbow Surg. 2015 Sep 22. pii: S1058-2746(15)00381-X. doi: 10.1016/j.jse.2015.07.007.

**Assessment of the glenohumeral joint's active and passive axial rotational range.**

Humphries A<sup>1</sup>, Cirovic S<sup>2</sup>, Bull AM<sup>3</sup>, Hearnden A<sup>4</sup>, Shaheen AF<sup>2</sup>.  
Author information

## Abstract

**BACKGROUND:**

Assessment of the range of axial rotation of the glenohumeral joint will improve understanding of shoulder function, with applications in shoulder rehabilitation and sports medicine. However, there is currently no complete description of motion of the joint. The study aimed to develop a reliable protocol to quantify the internal and external axial rotations of the glenohumeral joint during active and passive motion at multiple humeral positions.

**METHODS:**

Optical motion tracking was used to collect kinematic data from 20 healthy subjects. The humerus was positioned at 60°, 90°, and 120° of humerothoracic elevation in the coronal, scapular, and sagittal planes. Internal and external rotations were measured at each position for active and passive motion, where intrasubject standard deviations were used to assess variations in internal-external rotations.

**RESULTS:**

The protocol showed intrasubject variability in the axial rotational range of <5° for active and passive rotations at all humeral positions. Maximum internal rotation was shown to be dependent on humeral position, where a reduced range was measured in the sagittal plane (P < .001) and at 120° elevations (P < .001). Conversely, maximum external rotations were not affected by humeral position.

**CONCLUSION:**

The results describe normal ranges of internal-external rotation of the glenohumeral joint at multiple humeral positions. The protocol's low variability means that it could be used to test whether shoulder pathologic conditions lead to changes in axial rotational range at specific humeral positions.

**KEYWORDS:** Glenohumeral joint; active; axial rotation; kinematics; passive; reliability; shoulder

PMID:26410346

**Position sense diminished in females**

BMC Musculoskelet Disord. 2015 Sep 30;16(1):273. doi: 10.1186/s12891-015-0731-y.

**Sex differences in the shoulder joint position sense acuity: a cross-sectional study.**

Vafadar AK<sup>1</sup>, Côté JN<sup>2</sup>, Archambault PS<sup>3</sup>.

Author information

Abstract

**BACKGROUND:**

Work-related musculoskeletal disorders (WMSD) is the most expensive form of work disability. Female sex has been considered as an individual risk factor for the development of WMSD, specifically in the neck and shoulder region. One of the factors that might contribute to the higher injury rate in women is possible differences in neuromuscular control. Accordingly the purpose of this study was to estimate the effect of sex on shoulder joint position sense acuity (as a part of shoulder neuromuscular control) in healthy individuals.

**METHODS:**

Twenty-eight healthy participants, 14 females and 14 males were recruited for this study. To test position sense acuity, subjects were asked to flex their dominant shoulder to one of the three pre-defined angle ranges (low, mid and high-ranges) with eyes closed, hold their arm in that position for three seconds, go back to the starting position and then immediately replicate the same joint flexion angle, while the difference between the reproduced and original angle was taken as the measure of position sense error. The errors were measured using Vicon motion capture system. Subjects reproduced nine positions in total (3 ranges × 3 trials each).

**RESULTS:**

Calculation of absolute repositioning error (magnitude of error) showed no significant difference between men and women ( $p$ -value  $\geq 0.05$ ). However, the analysis of the direction of error (constant error) showed a significant difference between the sexes, as women tended to mostly overestimate the target, whereas men tended to both overestimate and underestimate the target ( $p$ -value  $\leq 0.01$ , observed power = 0.79). The results also showed that men had a significantly more variable error, indicating more variability in their position sense, compared to women ( $p$ -value  $\leq 0.05$ , observed power = 0.78).

**DISCUSSION:**

Differences observed in the constant JPS error suggest that men and women might use different neuromuscular control strategies in the upper limb. In addition, higher JPS variability observed in men might be one of the factors that could contribute to their lower rate of musculoskeletal disorders, compared to women.

**CONCLUSIONS:**

The result of this study showed that shoulder position sense, as part of the neuromuscular control system, differs between men and women. This finding can help us better understand the reasons behind the higher rate of musculoskeletal disorders in women, especially in the working environments.

PMID:26423066

**20 A. ROTATOR CUFF****Arthroscopic massive tear**

Arthroscopy. 2015 Sep 10. pii: S0749-8063(15)00569-1. doi: 10.1016/j.arthro.2015.06.038.

**Arthroscopic Repair for Chronic Massive Rotator Cuff Tears: A Systematic Review.**

Henry P<sup>1</sup>, Wasserstein D<sup>1</sup>, Park S<sup>1</sup>, Dwyer T<sup>2</sup>, Chahal J<sup>3</sup>, Slobogean G<sup>4</sup>, Schemitsch E<sup>5</sup>.  
Author information

Abstract

**PURPOSE:**

To systematically review the available evidence for arthroscopic repair of chronic massive rotator cuff tears and identify patient demographics, pre- and post-operative functional limitations, reparability and repair techniques, and retear rates.

**METHODS:**

Medline, Embase, the Cochrane Database of Systematic Reviews, and the Cochrane Central Register of Controlled Trials were searched to identify all clinical papers describing arthroscopic repair of chronic massive rotator cuff tears. Papers were excluded if a definition of "massive" was not provided, if the definition of "massive" was considered inappropriate by agreement between the 2 reviewers, or if patients with smaller tears were also included in the study population. Study quality and clinical outcome data were pooled and summarized.

**RESULTS:**

There were 18 papers that met the eligibility criteria; they involved 954 patients with a mean age of 63 (range, 37 to 87), 48% of whom were female. There were 5 prospective and 13 retrospective study designs. The overall study quality was poor according to the Modified Coleman Methodology Score. Of the 954 repairs, 81% were complete repairs and 19% were partial repairs. The follow-up range was between 33 and 52 months, and the mean duration between symptom onset and surgery was 24 months. Single-row repairs were performed in 56% of patients, and double-row repairs were performed in 44%. A pooled analysis demonstrated an improvement in visual analog scale from 5.9 to 1.7, active range of motion from 125° to 169°, and the Constant-Murley score from 49 to 74. The pooled retear rate was 79%.

**CONCLUSIONS:**

Arthroscopic repair of chronic massive rotator cuff tears is associated with complete repair in the majority of cases and consistently improves pain, range of motion, and functional outcome scores; however, the retear rate is high. Existing research on massive rotator cuff repair is limited to poor- to fair-quality studies.

**LEVEL OF EVIDENCE:**

Level IV, systematic review including Level IV studies.

PMID: 26364549

## Repair and psychology

Clin Orthop Relat Res. 2015 Nov;473(11):3494-500. doi: 10.1007/s11999-015-4258-1.

**Does Rotator Cuff Repair Improve Psychologic Status and Quality of Life in Patients With Rotator Cuff Tear?**

Cho CH<sup>1</sup>, Song KS<sup>2</sup>, Hwang I<sup>3</sup>, Warner JJ<sup>4</sup>.

Author information

## Abstract

**BACKGROUND:** Recently, psychological status, patient-centered outcomes, and health-related quality of life (HRQoL) in patients with scheduled or who underwent orthopaedic surgeries have been emphasized. The relationship between preoperative psychological status and postoperative clinical outcome in patients with rotator cuff repair has not yet been investigated.

**QUESTIONS/PURPOSES:** The primary objective of this study was to investigate changes in psychological status (depression, anxiety, insomnia) and HRQoL after rotator cuff repair. The secondary objective was to assess whether preoperative depression, anxiety, and insomnia predict clinical outcome after rotator cuff repair.

**METHODS:** Forty-seven patients who underwent rotator cuff repair prospectively completed the visual analog scale (VAS) pain score, the UCLA Scale, the American Shoulder and Elbow Surgeons' Scale (ASES), the Hospital Anxiety and Depression Scale (HADS), the Pittsburgh Sleep Quality Index (PSQI), and the World Health Organization Quality-of-life Scale Abbreviated Version (WHOQOL-BREF) before surgery and at 3, 6, and 12 months after surgery. Repeated-measures analysis of variance was used to evaluate the serial changes in psychological parameters and outcome measurements. The chi-square test was also used to compare preoperative and postoperative prevalence of depression, anxiety, and insomnia. Finally, multiple regression analysis was applied to determine the relationship between preoperative psychological status and postoperative clinical outcome.

**RESULTS:** With surgery, depression, anxiety, and insomnia decreased, whereas quality of life increased. The mean HADS-D and HADS-A scores and the mean PSQI score decreased from  $3.7 \pm 3.3$ ,  $4.3 \pm 4.3$ , and  $6.6 \pm 3.6$ , respectively, before surgery to  $2.1 \pm 2.3$ ,  $1.4 \pm 2.4$ , and  $4.2 \pm 3.3$ , respectively, at 12 months after surgery (HADS-D mean difference 1.6 [95% confidence interval {CI}, 0.6-2.6],  $p = 0.003$ ; HADS-A mean difference 2.9 [1.5-4.4],  $p < 0.001$ ; PSQI mean difference 2.4 [1.3-3.4],  $p < 0.001$ ). The mean WHOQOL-BREF score increased from  $60.4 \pm 11.0$  before surgery to  $67.4 \pm 11.8$  at 12 months after surgery (mean difference -7.0 [95% CI, -10.7 to -3.4],  $p < 0.001$ ). At 12 months after surgery, there were decreases in the prevalence of depression (six of 47 [22.8%] versus three of 47 [6.4%],  $p = 0.002$ ), anxiety (11 of 47 [23.4%] versus two of 47 [4.3%],  $p = 0.016$ ), and insomnia (33 of 47 [70.2%] versus 20 of 47 [42.6%],  $p = 0.022$ ). Preoperative HADS-depression, HADS-anxiety, and PSQI scores did not correlate with the VAS pain score, UCLA, or ASES scores at 12 months after surgery.

**CONCLUSIONS:** Psychological status and HRQoL improved with decreasing pain and increasing functional ability from 3 months after surgery. Preoperative depression, anxiety, and insomnia did not predict poor outcome after rotator cuff repair. Our findings suggest that successful rotator cuff repair may improve psychological status and HRQoL.

**LEVEL OF EVIDENCE:** Level II, prospective study.

PMID: 25791445



**24. ELBOW****Injections for LE**

Br J Sports Med. 2015 Sep 21. pii: bjsports-2014-094387. doi: 10.1136/bjsports-2014-094387.

**Injection therapies for lateral epicondylalgia: a systematic review and Bayesian network meta-analysis.**

Dong W<sup>1</sup>, Goost H<sup>2</sup>, Lin XB<sup>3</sup>, Burger C<sup>4</sup>, Paul C<sup>5</sup>, Wang ZL<sup>1</sup>, Kong FL<sup>1</sup>, Welle K<sup>4</sup>, Jiang ZC<sup>6</sup>, Kabir K<sup>4</sup>.

Author information

Abstract

**BACKGROUND:**

There are many injection therapies for lateral epicondylalgia but there has been no previous comprehensive comparison, based on the Bayesian method.

**METHODS:**

The MEDLINE, EMBASE and the Cochrane Central Register of Controlled Trials (CENTRAL) databases were searched for appropriate literature. The outcome measurement was the pain score. Direct comparisons were performed using the pairwise meta-analysis, and network meta-analysis, based on a Bayesian model, was used to calculate the results of all of the potentially possible comparisons and rank probabilities. A sensitivity analysis was performed by excluding low-quality studies. The inconsistency of the model was assessed by means of the node-splitting method. Metaregression was used to assess the relationship between the sample size and the treatment effect.

**RESULTS:**

All of the injection treatments showed a trend towards better effects than placebo. Additionally, the peppering technique did not add additional benefits when combined with other treatments. No significant changes were observed by excluding low-quality studies in the sensitivity analysis. No significant inconsistencies were found according to the inconsistency analysis, and metaregression revealed that the sample size was not associated with the treatment effects.

**CONCLUSIONS:**

Some commonly used injection therapies can be considered treatment candidates for lateral epicondylalgia, such as botulinum toxin, platelet-rich plasma and autologous blood injection, but corticosteroid is not recommended. Hyaluronate injection and prolotherapy might be more effective, but their superiority must be confirmed by more research. The peppering technique is not helpful in injection therapies.

**KEYWORDS:** Meta-analysis; Randomised controlled trial; Review; Tennis elbow; Treatment  
PMID:26392595

## PRP for LE

J Orthop Traumatol. 2015 Sep 11.

**Platelet-rich plasma versus autologous blood versus steroid injection in lateral epicondylitis: systematic review and network meta-analysis.**

Arirachakaran A<sup>1</sup>, Sukthuayat A<sup>2</sup>, Sisayanarane T<sup>3</sup>, Laoratanavoraphong S<sup>4</sup>, Kanchanatawan W<sup>5</sup>, Kongtharvonskul J<sup>6</sup>.

Author information

Abstract

**BACKGROUND:**

Clinical outcomes between the use of platelet-rich plasma (PRP), autologous blood (AB) and corticosteroid (CS) injection in lateral epicondylitis are still controversial.

**MATERIALS AND METHODS:**

A systematic review and network meta-analysis of randomized controlled trials was conducted with the aim of comparing relevant clinical outcomes between the use of PRP, AB and CS injection. Medline and Scopus databases were searched from inception to January 2015. A network meta-analysis was performed by applying weight regression for continuous outcomes and a mixed-effect Poisson regression for dichotomous outcomes.

**RESULTS:**

Ten of 374 identified studies were eligible. When compared to CS, AB injection showed significantly improved effects with unstandardized mean differences (UMD) in pain visual analog scale (VAS), Disabilities of Arm Shoulder and Hand (DASH), Patient-Related Tennis Elbow Evaluation (PRTEE) score and pressure pain threshold (PPT) of -2.5 (95 % confidence interval, -3.5, -1.5), -25.5 (-33.8, -17.2), -5.3 (-9.1, -1.6) and 9.9 (5.6, 14.2), respectively. PRP injections also showed significantly improved VAS and DASH scores when compared with CS. PRP showed significantly better VAS with UMD when compared to AB injection. AB injection has a higher risk of adverse effects, with a relative risk of 1.78 (1.00, 3.17), when compared to CS. The network meta-analysis suggested no statistically significant difference in multiple active treatment comparisons of VAS, DASH and PRTEE when comparing PRP and AB injections. However, AB injection had improved DASH score and PPT when compared with PRP injection. In terms of adverse effects, AB injection had a higher risk than PRP injection.

**CONCLUSIONS:**

This network meta-analysis provided additional information that PRP injection can improve pain and lower the risk of complications, whereas AB injection can improve pain, disabilities scores and pressure pain threshold but has a higher risk of complications.

**LEVEL OF EVIDENCE:**

Level I evidence.

**KEYWORDS:** Autologous blood; Corticosteroid; Lateral epicondylitis; Network meta-analysis; PRP; Systematic review

PMID:26362783

**30 A. IMPINGEMENT****Diagnosis**

Rheumatol Int. 2015 Oct 3.

**The validity of a non-radiologist reader in identifying cam and pincer femoroacetabular impingement (FAI) using plain radiography.**

Ratzlaff C<sup>1,2</sup>, Zhang C<sup>3</sup>, Korzan J<sup>3</sup>, Josey L<sup>3</sup>, Wong H<sup>3</sup>, Cibere J<sup>3,4</sup>, Prlic HM<sup>4</sup>, Kopec JA<sup>3,4</sup>, Esdaile JM<sup>3,4</sup>, Li LC<sup>3,4</sup>, Barber M<sup>5</sup>, Forster BB<sup>3,6</sup>.

Author information

**Abstract**

The purpose of this study was to evaluate the validity and reliability of a radiographic diagnosis of femoroacetabular impingement (FAI) by a non-radiologist. Symptomatic FAI is prevalent and thought to be a cause of hip osteoarthritis. However, the diagnosis is often delayed by 1-2 years, in large part because radiographic findings are often subtle and clinicians have been unaware of their significance. The purpose of this study was to evaluate the validity of a radiographic diagnosis of FAI by a non-radiologist. A population-based sample of 701 subjects was recruited in Vancouver, Canada. For the current study, 50 subjects were selected-40 randomly from the population sample and 10 from an orthopedic practice with confirmed FAI. An anterior-posterior pelvis and bilateral Dunn radiographs were acquired and read by a fellowship-trained musculoskeletal radiologist and a third-year medical student who received basic training in radiographic signs of FAI. Three radiographic signs were evaluated: the lateral center edge angle, alpha angle and crossover sign. Validity was assessed using sensitivity and specificity, Bland-Altman limits of agreement and kappa. The sample contained 65 % women (n = 31), was 62 % Caucasian and 38 % Chinese and had a mean age of 38.3 years. For correctly diagnosing FAI, the non-radiologist reader had a sensitivity of 0.83 and specificity of 0.87. Intra-rater  $\kappa$  value was 0.72, and prevalence-adjusted bias-adjusted  $\kappa$  was 0.76. This study provides evidence that a non-radiologist can accurately and reliably identify FAI on plain films.

**KEYWORDS:** Femoroacetabular impingement; Hip osteoarthritis; Hip radiography; Validation  
PMID: 26433895

**32 A. KNEE/ACL****Quad tendon a good alternative**

*Arthroscopy*. 2015 Sep 14. pii: S0749-8063(15)00582-4. doi: 10.1016/j.arthro.2015.06.051.

**Biomechanical Comparison of Quadriceps and Patellar Tendon Grafts in Anterior Cruciate Ligament Reconstruction.**

Shani RH<sup>1</sup>, Umpierrez E<sup>2</sup>, Nasert M<sup>3</sup>, Hiza EA<sup>4</sup>, Xerogeanes J<sup>5</sup>.

[Author information](#)

**Abstract****PURPOSE:**

To quantify the structural and material properties of 10-mm central sections of the quadriceps and patellar tendons in the setting of anterior cruciate ligament reconstruction using cadaveric grafts and biomechanical analysis.

**METHODS:**

The structural and mechanical properties of 11 bone-patellar tendon-bone (BPTB) and 12 quadriceps tendon-bone (QT) allografts were evaluated. Ten-millimeter-wide tendon grafts from both patellar and quadriceps tendons were harvested and subjected to biomechanical testing using the MTS servohydraulic test machine (MTS Systems, Eden Prairie, MN). The cross-sectional area was also calculated and compared between the BPTB and QT grafts.

**RESULTS:**

The mean cross-sectional area was  $91.2 \pm 10 \text{ mm}^2$  for the QT compared with  $48.4 \pm 8 \text{ mm}^2$  for the BPTB ( $P = .005$ ). The mean ultimate stress was  $23.9 \pm 7.4 \text{ MPa}$  for the QT and  $33.4 \pm 9.0 \text{ MPa}$  for the BPTB ( $P = .01$ ). Ultimate strain was similar between the 2 tested groups, with a 10.7% change in the QT group and an 11.4% change in the BPTB group ( $P = .484$ ). The Young modulus of elasticity was  $255.3 \pm 64.1 \text{ MPa}$  for the QT and  $337.8 \pm 67.7 \text{ MPa}$  for the BPTB ( $P = .006$ ). The mean stiffness was  $466.2 \pm 133 \text{ N/mm}$  for the QT and  $278.0 \pm 75 \text{ N/mm}$  for the BPTB ( $P = .005$ ). The mean ultimate load to failure was  $2,185.9 \pm 758.8 \text{ N}$  for the QT compared with  $1,580.6 \pm 479.4 \text{ N}$  for the BPTB ( $P = .045$ ).

**CONCLUSIONS:**

The cross-sectional area of the QT was nearly twice that of the BPTB. Ultimate load to failure and stiffness were also significantly higher for the QT graft. The variability in the cross-sectional area was similar in both tendon groups.

**CLINICAL RELEVANCE:**

On the basis of graft predictability and biomechanical properties, our study reaffirms that the QT graft is a biomechanically sound alternative for anterior cruciate ligament reconstruction.

PMID:26382635

## Changes in Biceps Femoris

Med Sci Sports Exerc. 2015 Oct 1.

### **Biceps Femoris Architecture and Strength in Athletes with a Prior ACL Reconstruction.**

Timmins RG<sup>1</sup>, Bourne MN, Shield AJ, Williams MD, Lorenzen C, Opar DA.  
Author information

Abstract

#### **PURPOSE:**

To determine if limbs with a history of anterior cruciate ligament (ACL) injury reconstructed from the semitendinosus (ST) display different biceps femoris long head (BFlh) architecture and eccentric strength, assessed during the Nordic hamstring exercise, compared to the contralateral uninjured limb.

#### **METHODS:**

The architectural characteristics of the BFlh were assessed at rest and at 25% of a maximal voluntary isometric contraction (MVIC) in the control (n=52) and previous ACL injury group (n=15) using two-dimensional ultrasonography. Eccentric knee-flexor strength was assessed during the Nordic hamstring exercise.

#### **RESULTS:**

Fascicle length was shorter (p=0.001; d range: 0.90 to 1.31) and pennation angle (p range: 0.001 to 0.006; d range: 0.87 to 0.93) was greater in the BFlh of the ACL injured limb when compared to the contralateral uninjured limb at rest and during 25% of MVIC. Eccentric strength was significantly lower in the ACL injured limb than the contralateral uninjured limb (-13.7%; -42.9N; 95% CI = -78.7 to -7.2; p=0.021; d=0.51). Fascicle length, MVIC and eccentric strength were not different between the left and right limb in the control group.

#### **CONCLUSIONS:**

Limbs with a history of ACL injury reconstructed from the ST have shorter fascicles and greater pennation angles in the BFlh compared to the contralateral uninjured side. Eccentric strength during the Nordic hamstring exercise of the ACL injured limb is significantly lower than the contralateral side. These findings have implications for ACL rehabilitation and hamstring injury prevention practices which should consider altered architectural characteristics.

PMID:26429732

**ACL and gait**

BMC Musculoskelet Disord. 2015 Sep 28;16(1):266. doi: 10.1186/s12891-015-0726-8.

**Three-dimensional kinematic analysis of ankle, knee, hip, and pelvic rotation during gait in patients after anterior cruciate ligament reconstruction - early results.**

Czamara A<sup>1,2</sup>, Markowska I<sup>3,4</sup>, Hagner-Derengowska M<sup>5,6</sup>.  
Author information

## Abstract

**BACKGROUND:**

The goal of this study was to biomechanically assess tibial rotation in the knee joint simultaneous changes in rotation of large joints of the lower limbs and pelvis during gait in patients during early postoperative stages following anterior cruciate ligament (ACLR) reconstruction. We hypothesized that tibial rotation is associated with changes in rotation of the large joints of the lower limbs and the pelvis during gait in patients after ACLR reconstruction.

**METHODS:**

The patients were divided into two groups. The ACLR group (n = 32 males) underwent primary ACLR in one leg and postoperative physiotherapy. The control group (n = 30 males) had no knee injuries. After clinical assessment in both groups, the values of kinematic parameters of foot, tibial, femoral, and pelvic rotation were measured during gait on a flat surface using the three-dimensional BTS Smart System. In the ACLR group, measurements were taken during the 4th, 9th, and 14th weeks of postoperative physiotherapy. The results of the ACLR group were compared with those of the control group.

**RESULTS:**

During gait, between the 9th and 14th weeks following ACLR, there are normal values of foot, tibia, and pelvic rotation in the operated legs compared with results obtained from un-operated legs and the control group.

**DISCUSSION:**

Analysis of rotations occurring only in knee joints does not reflect all of the multiarticular disorders of gait kinematics. The study also suggests that analyzing tibial rotation in the knee joint with simultaneous changes in rotation in large joints of the lower limbs provides better opportunities than singular analysis of rotation in the knee joint for the assessment of disorders in gait kinematics.

**CONCLUSIONS:**

In gait, at the maximal extension of the knee during preparation for the stance phase, external hip rotation patterns have not been fully restored 14 weeks after ACLR.

PMID:26416119

### 33. MENISCUS

#### Dislocation and damage

Knee Surg Sports Traumatol Arthrosc. 2015 Oct;23(10):3019-25. doi: 10.1007/s00167-015-3540-9. Epub 2015 Feb 21.

#### **Meniscal tears and articular cartilage damage in the dislocated knee.**

Krych AJ<sup>1</sup>, Sousa PL<sup>2</sup>, King AH<sup>3</sup>, Engasser WM<sup>4</sup>, Stuart MJ<sup>5</sup>, Levy BA<sup>6</sup>.  
Author information

#### Abstract

##### **PURPOSE:**

Knee dislocations can cause significant damage to intra-articular knee structures, but currently there are limited data reporting articular cartilage and meniscal injuries in this setting. The purpose of this study is to (1) report the rate of concomitant intra-articular injuries at the time of multiligament reconstruction for knee dislocation, (2) determine whether the pattern of ligament injury is associated with the presence of chondral and meniscal injuries, and (3) assess the relationship between timing of surgery and incidence of chondral and meniscal injuries.

##### **METHODS:**

The records of patients who sustained a knee dislocation between 1992 and 2013 were retrospectively reviewed. Patients included for further review had a PCL-based multiligament knee injury or a minimum of three disrupted ligaments, both indicative of knee dislocation. Patient demographics, ligament injury patterns, meniscal tears and chondral injuries at arthroscopy, and interval from injury to surgery were recorded. Early surgical intervention was defined as <3 months, delayed was between 3 and 12 months, and chronic was >12 months. Data analysis compared ligament injury pattern with chondral and meniscal injuries, as well as the rates of intra-articular injury by timing of surgery.

##### **RESULTS:**

One-hundred and twenty-one patients (122 knees) were included (93 males, 28 females) with a median age at time of surgery of 31 years (range 15-62). Ninety-three knees (76 %) had associated chondral or meniscal injury. Sixty-seven knees (55 %) presented with meniscal tears (26 isolated medial, 27 isolated lateral, and 14 combined medial/lateral), while 52 knees (48 %) had chondral damage, most commonly in the medial compartment. Schenck classification as well as side of injury did not demonstrate consistent relationships with intra-articular injury. A higher incidence of damage to the lateral femoral condyle (20 % vs 3 %;  $p = 0.02$ ), lateral tibial plateau (20 % vs 2 %;  $p < 0.01$ ), and patella (40 % vs 13 %;  $p = 0.01$ ) was found in the chronic group compared to the early group. The chronic group contained significantly more patients with bicompartamental and tricompartmental chondral lesions (25 % vs 6 %;  $p = 0.03$  and 10 % vs 0 %;  $p = 0.02$ , respectively).

##### **CONCLUSION:**

Meniscal tears and chondral damage occur frequently in patients with a knee dislocation. A longer interval from injury to surgical reconstruction is associated with higher rates of articular cartilage lesions, especially in multiple compartments.

##### **LEVEL OF EVIDENCE: IV.**

**KEYWORDS:** Cartilage; Knee dislocation; Meniscus; Multiple ligaments

PMID: 25700677

### Symptomatic cartilage injuries

J Am Acad Orthop Surg. 2015 Oct;23(10):633-40. doi: 10.5435/JAAOS-D-14-00241. Epub 2015 Sep 16.

#### **Clinical Evaluation and Preoperative Planning of Articular Cartilage Lesions of the Knee.**

Mall NA, Harris JD, Cole BJ.

##### Abstract

Articular cartilage injuries are quite common. Most studies and review articles on cartilage repair and restoration focus on the different techniques available to treat cartilage defects; however, few thoroughly discuss the initial evaluation of patients with these defects. Outcomes are intimately associated with appropriate patient selection and indications for treatment; therefore, understanding the initial evaluation and conservative treatment of cartilage defects is essential to achieving excellent outcomes after surgical intervention, regardless of the chosen procedure. In patients with cartilage injury, a careful history, physical examination, and imaging are required before treating the lesion to ensure the patient's symptoms are actually related to the defect. To address any special considerations, other factors must be considered to improve patient outcomes, including the status of the meniscus, assessing and treating malalignment or offloading the patellofemoral compartment, and reconstructing any ligamentous deficiencies. It is important for medical providers to understand what cartilage lesions may be symptomatic and when to refer these patients to surgeons who manage cartilage injury.

**KEYWORDS:** cartilage; knee; preoperative evaluation; restoration  
PMID:26377673



## 34. PATELLA

### Medial patellofemoral lig

#### **Injury patterns of medial patellofemoral ligament and correlation analysis with articular cartilage lesions of the lateral femoral condyle after acute lateral patellar dislocation in adults: An MRI evaluation**

Guang-ying Zhang Lei Zheng Yan Feng Hao Shi Wei Liu Bing-jun Ji Bai-sheng Sun Hong-yu Ding

#### **Abstract**

##### **Objectives**

The purpose of this study was to investigate the injury characteristics of medial patellofemoral ligament (MPFL), and to analyse the correlations between the injury patterns of MPFL and articular cartilage lesions of the lateral femoral condyle in adults with acute lateral patellar dislocation (LPD).

##### **Methods**

Magnetic resonance (MR) images were prospectively obtained in 121 consecutive adults with acute LPD. Images were acquired using standardised protocols and these were independently evaluated by two radiologists.

##### **Results**

Forty-eight cases of partial MPFL tear and 71 cases of complete MPFL tear were identified. Injuries occurred at an isolated femoral attachment (FEM) in 48 cases, an isolated patellar insertion (PAT) in 36 cases and an isolated mid-substance (MID) in five cases. More than one site of injury to the MPFL (COM) was identified in 30 cases.

The prevalence rate of chondral and osteochondral lesions of the lateral femoral condyle were 4.2% (2/48) and 6.3% (3/48) in the FEM subgroup, 19.4% (7/36) and 22.2% (8/36) in the PAT subgroup and 6.7% (2/30) and 13.3% (4/30) in the COM subgroup, respectively. The PAT subgroup showed significantly higher prevalence rate of chondral and osteochondral lesions in the lateral femoral condyle when compared with the FEM subgroup.

The prevalence rate of chondral and osteochondral lesions of the lateral femoral condyle were 8.5% (6/71) and 19.7% (14/71) in the complete MPFL tear subgroup and 10.4% (5/48) and 4.2% (2/58) in the partial MPFL tear subgroup, respectively. The subgroup of the complete MPFL tear showed significantly higher prevalence rate of osteochondral lesions in the lateral femoral condyle when compared with the subgroup of the partial MPFL tear.

##### **Conclusions**

Firstly, the MPFL is most easily injured at the FEM, and secondly at the PAT in adults after acute LPD. The complete MPFL tear is more often concomitant with osteochondral lesions of the lateral femoral condyle than the partial MPFL tear. The isolated patellar-sided MPFL tear is more easily concomitant with chondral lesions and osteochondral lesions of the lateral femoral condyle than the isolated femoral-sided MPFL tear.

**Keywords:** Lateral patellar dislocation, Knee, Medial patellofemoral ligament, Articular cartilage, Magnetic resonance imaging

**35. KNEE/TOTAL****Good with osteoporosis**

BMC Musculoskelet Disord. 2015 Sep 21;16(1):259. doi: 10.1186/s12891-015-0716-x.

**Total Hip and Knee arthroplasty in a patient with osteopetrosis: a case report and review of the literature.**Xie L<sup>1</sup>, Ding F<sup>2</sup>, Jiao J<sup>3</sup>, Kan W<sup>4</sup>, Wang J<sup>5</sup>.

Author information

Abstract

**BACKGROUND:**

Osteopetrosis is an uncommon, inherited disease, characterized by osteosclerosis, obliteration of the medullary canal, calcified cartilage and brittle bone due to impaired osteoclast resorption. Osteoarthritis is common in patients with osteopetrosis. If the patient has pain and dysfunction, total joint arthroplasty is often the treatment of choice but presents many intraoperative and postoperative challenges. Few studies have presented both Total hip arthroplasty (THA) and Total knee arthroplasty (TKA) in one patient. This article describes a case of left hip osteoarthritis and right knee osteoarthritis in a patient with osteopetrosis. We performed THA and TKA in a 59-year-old osteopetrotic patient with painful osteoarthritis in the left hip and right knee.

**CASE PRESENTATION:**

A 59-years-old female with osteopetrosis was referred to our department because of a history of left hip pain and bilateral, right greater-than-left, knee pain with activity limitation for 13 years. She had no fracture history. In our hospital the patient underwent THA in the left hip firstly. Six months later, we performed TKA of the right knee. At 15-months follow-up, the components were in good position, and the patient could walk freely and perform activities of daily living with no pain.

**CONCLUSIONS:**

This case report demonstrates that total joint arthroplasty is an effective treatment for painful hip and knee osteoarthritis in patients with osteopetrosis.

PMID:26391128

**37. OSTEOARTHRITIS/KNEE****PRP effective**

Knee Surg Sports Traumatol Arthrosc. 2015 Sep 19.

**Short-term outcomes of platelet-rich plasma injection for treatment of osteoarthritis of the knee.**

Kanchanatawan W<sup>1</sup>, Arirachakaran A<sup>2</sup>, Chaijenkij K<sup>3</sup>, Prasathaporn N<sup>4</sup>, Boonard M<sup>5</sup>, Piyapittayanun P<sup>6</sup>, Kongtharvonskul J<sup>7</sup>.

Author information

Abstract

**PURPOSE:**

To compare the clinical outcomes of osteoarthritis indices (WOMAC and Lequesne scores) and adverse events in the treatment of osteoarthritis (OA) of the knee with platelet-rich plasma (PRP) versus hyaluronic acid (HA) or placebo.

**METHODS:**

A systematic review and meta-regression were performed to compare outcomes between PRP injections versus HA or placebo. Relevant randomized control trials were identified from Medline and Scopus from date of inception to 13 August 2015.

**RESULTS:**

Nine of 551 studies were eligible; 6, 5, 5, 5, 2, 2, 2 and 7 studies were included in pooling of WOMAC total, pain, stiffness and function scores, Lequesne score, IKDC score, EQ-VAS score and adverse events in OA knee patients, respectively. The PRP injections had -15.4 (95 % CI -28.6, -2.3,  $p = 0.021$ ), lower mean WOMAC total scores, and 8.83 (95 % CI 5.88, 11.78,  $p < 0.001$ ), 7.37 (95 % CI 4.33, 10.05,  $p = 0.021$ ) higher mean IKDC and EQ-VAS scores when compared to HA injections. However, PRP injections had no significant differences in WOMAC pain, stiffness and function scores, as well as Lequesne score and adverse events when compared to HA or placebo.

**CONCLUSION:**

In short-term outcomes ( $\leq 1$  year), PRP injection has improved functional outcomes (WOMAC total scores, IKDC score and EQ-VAS) when compared to HA and placebo, but has no statistically significant difference in adverse events when compared to HA and placebo. This study suggests that PRP injection is more efficacious than HA injection and placebo in reducing symptoms and improving function and quality of life. It has the potential to be the treatment of choice in patients with mild-to-moderate OA of the knee who have not responded to conventional treatment.

**LEVEL OF EVIDENCE: I.**

**KEYWORDS:** HA; Hyaluronic acid; Meta-analysis; Osteoarthritis; PRP; Platelet-rich plasma  
PMID:26387122

## Exercise and OA

Br J Sports Med. 2015 Sep 24. pii: bjsports-2015-095424. doi: 10.1136/bjsports-2015-095424.

**Exercise for osteoarthritis of the knee: a Cochrane systematic review.**

Fransen M<sup>1</sup>, McConnell S<sup>2</sup>, Harmer AR<sup>1</sup>, Van der Esch M<sup>3</sup>, Simic M<sup>1</sup>, Bennell KL<sup>4</sup>.  
Author information

Abstract

**OBJECTIVE:**

To determine whether land-based therapeutic exercise is beneficial for people with knee osteoarthritis (OA) in terms of reduced joint pain or improved physical function and quality of life.

**METHODS:**

Five electronic databases were searched, up until May 2013. Randomised clinical trials comparing some form of land-based therapeutic exercise with a non-exercise control were selected. Three teams of two review authors independently extracted data and assessed risk of bias for each study. Standardised mean differences immediately after treatment and 2-6 months after cessation of formal treatment were separately pooled using a random effects model.

**RESULTS:**

In total, 54 studies were identified. Overall, 19 (35%) studies reported adequate random sequence generation, allocation concealment and adequately accounted for incomplete outcome data. However, research results may be vulnerable to selection, attrition and detection bias. Pooled results from 44 trials indicated that exercise significantly reduced pain (12 points/100; 95% CI 10 to 15) and improved physical function (10 points/100; 95% CI 8 to 13) to a moderate degree immediately after treatment, while evidence from 13 studies revealed that exercise significantly improved quality of life immediately after treatment with small effect (4 points/100; 95% CI 2 to 5). In addition, 12 studies provided 2-month to 6-month post-treatment sustainability data which showed significantly reduced knee pain (6 points/100; 95% CI 3 to 9) and 10 studies which showed improved physical function (3 points/100; 95% CI 1 to 5).

**CONCLUSIONS:**

Among people with knee osteoarthritis, land-based therapeutic exercise provides short-term benefit that is sustained for at least 2-6 months after cessation of formal treatment.

PMID:26405113

## OA and sensitization

Arthritis Care Res (Hoboken). 2015 Oct 5. doi: 10.1002/acr.22712.

**Enhanced pain sensitivity among individuals with symptomatic knee osteoarthritis:  
Potential sex differences in central sensitization.**

Bartley EJ<sup>1</sup>, King CD<sup>1</sup>, Sibille KT<sup>2</sup>, Cruz-Almeida Y<sup>2</sup>, Riley JL 3rd<sup>1</sup>, Glover TL<sup>3</sup>, Goodin BR<sup>4</sup>, Sotolongo AS<sup>5</sup>, Herbert MS<sup>4</sup>, Bulls HW<sup>4</sup>, Staud R<sup>6</sup>, Fessler BJ<sup>7</sup>, Redden DT<sup>8</sup>, Bradley LA<sup>5</sup>, Fillingim RB<sup>1</sup>.

Author information

Abstract

**OBJECTIVE:**

Symptomatic knee osteoarthritis (OA) is a condition commonly associated with increased pain, disability, and functional limitations. Given the poor correspondence between radiographic evidence and clinical pain, central sensitization has been implicated as a potential mechanism underlying pain facilitation in knee OA. Sex may be a moderator of centrally-mediated changes in knee OA pain; however, few studies have systematically assessed this. Therefore, the aim of this study was to examine differences in peripheral and central sensitization in men and women with symptomatic knee OA, as well as to determine whether these differences vary across age (middle-age vs. older-age).

**METHODS:**

Participants (N=288) between the ages of 45 and 85 completed a battery of quantitative sensory pain procedures assessing sensitivity to contact heat, cold pressor, mechanical pressure, and punctate stimuli. Differences in temporal summation (TS) were examined, as well as measures of clinical pain and functional performance.

**RESULTS:**

When compared to men, women exhibited greater sensitivity to multiple pain modalities (i.e., lower heat, cold, pressure thresholds/tolerances, greater TS of pain); however, there were no sex differences in clinical pain with the exception of greater widespread pain observed in women. Although there were select age-related differences in pain sensitivity, sex differences in pain varied minimally across age cohort.

**CONCLUSION:**

Overall, these findings provide evidence for greater overall sensitivity to experimental pain in women with symptomatic knee osteoarthritis (OA), compared to men, suggesting that enhanced central sensitivity may be an important contributor to pain in this group. This article is protected by copyright. All rights reserved.

**KEYWORDS:** central sensitization, sex differences; clinical pain; experimental pain sensitivity; knee osteoarthritis

PMID:26434740

**PRP and Hyaluronic acid**

Eur J Orthop Surg Traumatol. 2015 Sep 24.

**Efficacy and safety profile of a compound composed of platelet-rich plasma and hyaluronic acid in the treatment for knee osteoarthritis (preliminary results).**

Abate M<sup>1</sup>, Verna S<sup>2</sup>, Schiavone C<sup>3</sup>, Di Gregorio P<sup>2</sup>, Salini V<sup>3</sup>.

Author information

Abstract

**BACKGROUND:**

The combined use of hyaluronic acid and platelet-rich plasma has never been reported in the treatment for osteoarthritis. Aim of this paper was to evaluate the efficacy of this association and to compare retrospectively these results with those of a cohort of patients treated with platelet-rich plasma only.

**MATERIALS AND METHODS:**

Subjects with mild-to-moderate knee osteoarthritis were enrolled. After clinical and ultrasound evaluation, patients received a weekly intra-articular injection of 2 ml of hyaluronic acid added with 2 ml of platelet-rich plasma for 3 weeks. Follow-up was performed at 1, 3, and 6 months. The same clinical parameters were retrospectively collected from a cohort of patients treated with 4-5 ml of platelet-rich plasma only.

**RESULTS:**

Forty knees were treated in both groups. The intra-group comparison showed a significant improvement in clinical and functional outcomes at 1, 3, and 6 months, while the infra-group comparison did not show any significant difference.

**CONCLUSIONS:**

The association of platelet-rich plasma + hyaluronic acid has the same efficacy of platelet-rich plasma only, administered in higher volume. We may infer that hyaluronic acid works synergically and improves the activity of several molecules contained in platelet-rich plasma.

**KEYWORDS:** Hyaluronic acid; Knee osteoarthritis; Platelet-rich plasma; Safety profile

PMID:26403468

## Vibration therapy and exercise

Clin Rehabil. 2015 Oct 1. pii: 0269215515607970.

**Effects of Whole Body Vibration Exercise associated with Quadriceps Resistance Exercise on functioning and quality of life in patients with knee osteoarthritis: A randomized controlled trial.**

Wang P<sup>1</sup>, Yang L<sup>1</sup>, Liu C<sup>1</sup>, Wei X<sup>1</sup>, Yang X<sup>1</sup>, Zhou Y<sup>1</sup>, Jiang H<sup>2</sup>, Lei Z<sup>2</sup>, Reinhardt JD<sup>3</sup>, He C<sup>4</sup>.  
Author information

Abstract

**OBJECTIVE:**

To determine effects of Whole Body Vibration Exercise (WBVE) associated with quadriceps resistance exercises (QRE) versus QRE only on pain, physical function, biomarkers in serum and urine, activities of daily living (ADL), and quality of life in patients with knee osteoarthritis (OA).

**DESIGN:**

Randomized-controlled trial .

**SETTING:**

Rehabilitation medicine outpatient department of West China Hospital, Chengdu, Sichuan, People's Republic of China.

**SUBJECTS:**

Forty-nine patients were assigned to WBVE+QRE and 50 to QRE .

**MAIN OUTCOME MEASURES:**

Primary outcomes included pain assessed with visual analogue scale (VAS), Timed up & go test (TUG), 6-min walk distance test (6MWD), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Secondary outcomes comprised range of motion, muscular strength, serum COMP and urinary CTX-II, Lequesne Index (LI), and SF-36. All outcomes were analyzed with mixed effects regression.

**RESULTS:**

Compared with QRE, WBVE+QRE showed significantly greater improvement in VAS at 4weeks (p=0.03), in VAS (p<0.01), 6MWD (p=0.01), WOMAC pain (p=0.01), and WOMAC physical function (p=0.02) at 16 weeks, and in all primary outcomes at 24 weeks (all p<0.01).

**CONCLUSION:**

Over a six months period, WBVE in combination with QRE was superior to QRE in most outcomes.

**KEYWORDS:** COMP; CTX-II; Osteoarthritis; pain; physical function; resistance exercise; whole body vibration

PMID: 26427960

## MT and ex in OA

**The Incremental Effects of Manual Therapy or Booster Sessions in Addition to Exercise Therapy for Knee Osteoarthritis: A Randomized Clinical Trial**

**Authors:** J. Haxby Abbott, DPT, PhD, FNZCP<sup>1</sup>, Catherine M. Chapple, PT, MManipPhty, PhD<sup>2</sup>, G. Kelley Fitzgerald, PT, PhD, FAPTA<sup>3</sup>, Julie M. Fritz, PT, PhD, ATC<sup>4</sup>, John D. Childs, PT, PhD<sup>5</sup>, Helen Harcombe, BPhy, MPH, PhD<sup>1,6</sup>, Kirsten Stout, RN<sup>1</sup>

**Level of Evidence** Therapy, level 1b. *J Orthop Sports Phys Ther*, Epub 28 Sep 2015.  
doi:10.2519/jospt.2015.6015

**Study Design** A factorial randomized controlled trial.

**Objectives** To investigate the addition of manual therapy to exercise therapy for the reduction of pain and increase of physical function in people with knee osteoarthritis (OA), and whether “booster sessions” compared to consecutive sessions may improve outcomes.

**Background** The benefits of providing manual therapy in addition to exercise therapy, or of distributing treatment sessions over time using periodic booster sessions, in people with knee OA are not well established.

**Methods** All participants had knee OA and were provided 12 sessions of multimodal exercise therapy supervised by a physical therapist. Participants were randomly allocated to 1 of 4 groups: exercise therapy in consecutive sessions, exercise therapy distributed over a year using booster sessions, exercise therapy plus manual therapy without booster sessions, and exercise therapy plus manual therapy with booster sessions. The primary outcome measure was the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC score; 0-240 scale) at 1-year follow-up. Secondary outcome measures were the numeric pain-rating scale and physical performance tests.

**Results** Of 75 participants recruited, 66 (88%) were retained at 1-year follow-up. Factorial analysis of covariance of the main effects showed significant benefit from booster sessions ( $P = .009$ ) and manual therapy ( $P = .023$ ) over exercise therapy alone. Group analysis showed that exercise therapy with booster sessions (WOMAC score,  $-46.0$  points; 95% confidence interval [CI]:  $-80.0, -12.0$ ) and exercise therapy plus manual therapy (WOMAC score,  $-37.5$  points; 95% CI:  $-69.7, -5.5$ ) had superior effects compared with exercise therapy alone. The combined strategy of exercise therapy plus manual therapy with booster sessions was not superior to exercise therapy alone.

**Conclusion** Distributing 12 sessions of exercise therapy over a year in the form of booster sessions was more effective than providing 12 consecutive exercise therapy sessions. Providing manual therapy in addition to exercise therapy improved treatment effectiveness compared to providing 12 consecutive exercise therapy sessions alone. Trial registered with the Australian New Zealand Clinical Trials Registry (ACTRN12612000460808).

**Keyword:** arthralgia, OA, physical therapy techniques, randomized controlled trial



**41 A. ACHILLES TENDON AND CALF****Dynamic rehab the best**

Br J Sports Med. 2015 Oct;49(20):1329-35. doi: 10.1136/bjsports-2015-094935. Epub 2015 Aug 17.

**Early functional rehabilitation or cast immobilisation for the postoperative management of acute Achilles tendon rupture? A systematic review and meta-analysis of randomised controlled trials.**

McCormack R<sup>1</sup>, Bovard J<sup>1</sup>.  
Author information

Abstract

**OBJECTIVE:**

To determine which postoperative rehabilitation regime is superior following surgical repair of acute Achilles tendon rupture. The primary outcomes were patient safety and satisfaction.

**DESIGN:**

Intervention meta-analysis.

**DATA SOURCES:**

The MEDLINE and CINAHL electronic databases were searched from their date of inception until June 2015 using keywords related to acute Achilles tendon rupture, surgical repair and rehabilitation. The electronic database search was supplemented with forward citation tracking using the Web of Science.

**ELIGIBILITY CRITERIA:**

Randomised controlled trials comparing clinical and/or patient-reported outcomes between patients receiving early functional postoperative ankle motion and weight bearing (bracing group), and traditional ankle immobilisation with a non-weight bearing rigid cast (cast group) were eligible for inclusion. Fourteen articles were identified as potentially eligible; 10 sufficient-quality randomised controlled trials involving 570 patients were included for meta-analysis.

**MAIN RESULTS:**

A high proportion of patients were able to return to prior employment and sporting activity in both groups. Five of the six trials measuring the time interval showed a faster return to prior sporting level in the bracing group. Subjective patient outcomes were significantly better in the bracing group (for good and excellent results,  $p=0.01$ ; OR, 3.13; 95% CI 1.30 to 7.53). There was no difference in major complications between the two groups ( $p=0.21$ ; RD, -0.03; 95% CI -0.06 to 0.01). Dynamometry and anthropometry measurements favoured functional rehabilitation at 6-12 weeks postoperation; however, by 6 months postoperative, the differences were negligible.

**CONCLUSIONS:**

Compared to traditional ankle immobilisation, with a non-weight bearing cast following surgical repair of acute Achilles tendon rupture, early dynamic functional rehabilitation is as safe with higher patient satisfaction.

**KEYWORDS:** Achilles; Meta-analysis; Rehabilitation  
PMID: 26281836

**41 B. COMPARTMENT SYNDROME****Peroneal nerve**

J Orthop Traumatol. 2015 Sep 11.

**Deep peroneal nerve palsy with isolated lateral compartment syndrome secondary to peroneus longus tear: a report of two cases and a review of the literature.**

Hiramatsu K<sup>1</sup>, Yonetani Y<sup>2</sup>, Kinugasa K<sup>2</sup>, Nakamura N<sup>3,4</sup>, Yamamoto K<sup>5</sup>, Yoshikawa H<sup>6</sup>, Hamada M<sup>2</sup>.

Author information

**Abstract**

Drop foot is typically caused by neurologic disease such as lumbar disc herniation, but we report two rare cases of deep peroneal nerve palsy with isolated lateral compartment syndrome secondary to peroneus longus tears. Both patients developed mild pain in the lower legs while playing sport, and were aware of drop foot. As compartment pressures were elevated, fasciotomy was performed immediately, and the tendon of the peroneus longus was completely detached from its proximal origin. The patients were able to return their original sports after 3 months, and clinical examination revealed no hypesthesia or muscle weakness in the deep peroneal nerve area at the time of last follow-up. The common peroneal nerve pierced the deep fascia and lay over the fibular neck, which formed the floor of a short tunnel (the so-called fibular tunnel), then passed the lateral compartment just behind the peroneus longus. The characteristic anatomical situation between the fibular tunnel and peroneus longus might have caused deep peroneal nerve palsy in these two cases after hematoma adjacent to the fibular tunnel increased lateral compartment pressure.

**KEYWORDS:** Deep peroneal nerve palsy; Lateral compartment syndrome; Peroneus longus tear  
PMID:26362782

**Fx and CS**

J Orthop Trauma. 2015 Oct;29(10):451-5. doi: 10.1097/BOT.0000000000000347.

**Predictors of Compartment Syndrome After Tibial Fracture.**

McQueen MM<sup>1</sup>, Duckworth AD, Aitken SA, Sharma RA, Court-Brown CM.  
Author information

Abstract

**OBJECTIVES:**

The aim of our study was to identify the risk factors associated with the development of acute compartment syndrome (ACS) after a fracture of the tibia.

**DESIGN:**

Retrospective cohort study.

**SETTING:**

Orthopaedic trauma unit, university teaching hospital.

**PATIENTS:**

From our trauma database, we identified all patients who sustained an acute tibial diaphyseal fracture over a 13-year period. A retrospective analysis of 1407 patients was performed to record and analyze the OTA fracture classification, open fracture grade according to Gustilo, soft tissue injury classification according to Tscherny, treatment, development of ACS, and other patient demographics including smoking, occupation, and socioeconomic deprivation.

**MAIN OUTCOME MEASURE:**

A diagnosis of ACS was made using clinical signs, compartment pressure monitoring, or a combination of the 2.

**RESULTS:**

One thousand three hundred eighty-eight patients were included with a mean age of 39 (12-98) years, and 957 (69%) were male. One hundred sixty patients (11.5%) were diagnosed with ACS. On initial analysis, age, male gender, blue-collar occupation, sporting injury, fracture classification, and treatment with intramedullary nails were predictive of ACS (all  $P < 0.05$ ). Age was the strongest predictor of developing ACS ( $P < 0.001$ ), with the highest prevalence between 12-19 years and 20-29 years. Occupation ( $P = 0.01$ ) and implant type ( $P = 0.004$ ) were the only factors that remained significant after adjusting for age. On further subanalysis, implant type was not predictive when stratified by Tscherny class ( $P = 0.11$ ).

**CONCLUSIONS:**

We have documented the risk factors for the development of ACS after an acute tibial diaphyseal fracture, with youth the strongest predictor.

**LEVEL OF EVIDENCE:**

Prognostic Level II. See Instructions for Authors for a complete description of levels of evidence.

PMID:25882967

### 43. HALLUX VALGUS

#### Measuring axis of motion

J Foot Ankle Surg. 2015 Sep 17. pii: S1067-2516(15)00162-3. doi: 10.1053/j.jfas.2015.04.010.

#### **The Mechanical Axis of the First Ray: A Radiographic Assessment in Hallux Abducto Valgus Evaluation.**

LaPorta GA<sup>1</sup>, Nasser EM<sup>2</sup>, Mulhern JL<sup>3</sup>, Malay DS<sup>4</sup>.

Author information

#### Abstract

The present report describes a new method of hallux abducto valgus deformity correction planning using the mechanical axis of the medial column (mechanical axis planning). This method of radiographic evaluation identifies an ideal position for the first metatarsal after correction and is useful regardless of the surgical procedure chosen. We retrospectively reviewed 200 radiographs to identify a "normal" value for the mechanical axis angle. We reviewed 100 radiographs of patients with hallux abducto valgus deformity (deformity group) and 100 radiographs of patients without hallux abducto valgus deformity (control group). The deformity group revealed an M1-M2 anatomic axis angle of  $13.5^{\circ} \pm 2.83^{\circ}$  and an M1-M2 mechanical axis angle of  $11.58^{\circ} \pm 1^{\circ}$ . The control group revealed an M1-M2 anatomic axis angle of  $7.5^{\circ} \pm 1.76^{\circ}$  and an M1-M2 mechanical axis angle of  $11.19^{\circ} \pm 0.9^{\circ}$ . The differences in the M1-M2 anatomic axis angle and M1-M2 mechanical axis angle were statistically significant between the control and deformity groups. We sought to provide a reliable method for planning hallux abducto valgus deformity correction by aligning the mechanical axis of the medial column and the mechanical axis of the first ray to the "normal" value of  $11^{\circ}$  to reduce the deformity.

**KEYWORDS:** M1-M2 mechanical axis; bunion; deformity correction; first intermetatarsal angle; hallux valgus; metatarsal; osteotomy

PMID: 2638705

**KinesioTaping****Short-Term Effects of Kinesiotaping on Pain and Joint Alignment in Conservative Treatment of Hallux Valgus**

Gul Oznur Karabicak Nilgun Bek, PT. PhD Ugur Tiftikci, MD

**Objective**

The main aim of this study was to measure short-term effects of kinesiotaping on pain and joint alignment in the conservative treatment of hallux valgus.

**Method**

Twenty-one female patients diagnosed with a total of 34 feet with hallux valgus (13 bilateral, 6 right, and 2 left) participated in this study. Kinesiotaping was implemented after the first assessment and renewed in days 3, 7, and 10. The main outcome measures were pain, as assessed using visual analog scale, and hallux adduction angle, as measured by goniometry. Secondary outcome measure was patients' functional status, as measured by Foot Function Index and the hallux valgus scale of the American Orthopaedic Foot and Ankle Society (AOFAS). The radiographic results were also measured before and after 1 month of treatment. The Wilcoxon test was used to compare the differences between initial and final scores of AOFAS, as well as FFI scales and hallux valgus angle assessment scores.

**Results**

There was a significant reduction in goniometric measurement of hallux valgus angle ( $P = .001$ ). There was a significant reduction in pain intensity ( $P = .001$ ) and AOFAS and Foot Function Index scores at the end of the treatment ( $P = .001$  and  $P = .001$ , respectively). There was a significant difference between radiographic results in 1-month control ( $P = .009$ ).

**Conclusions**

For this group of female patients, pain and joint alignment were improved after a 10-day kinesiotape implementation in patients with hallux valgus. The findings showed short-term decreased pain and disability in hallux valgus deformity.

## 45 B. MANUAL THERAPY CERVICAL

### Assessment of Cervical genic HA's

#### Physical examination tests for screening and diagnosis of cervicogenic headache: A systematic review

##### Highlights

- Clinometric properties of tests for cervicogenic headache (CGH) were reviewed.
- Diagnostic tests for CGH showed high levels of reliability and diagnostic accuracy.
- The cervical flexion-rotation test is the most reliable and accurate for CGH.

##### Abstract

It has been suggested that differential diagnosis of headaches should consist of a robust subjective examination and a detailed physical examination of the cervical spine. Cervicogenic headache (CGH) is a form of headache that involves referred pain from the neck. To our knowledge, no studies have summarized the reliability and diagnostic accuracy of physical examination tests for CGH. The aim of this study was to summarize the reliability and diagnostic accuracy of physical examination tests used to diagnose CGH. A systematic review following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines was performed in four electronic databases (MEDLINE, Web of Science, Embase and Scopus). Full text reports concerning physical tests for the diagnosis of CGH which reported the clinometric properties for assessment of CGH, were included and screened for methodological quality. *Quality Appraisal for Reliability Studies* (QAREL) and *Quality Assessment of Studies of Diagnostic Accuracy* (QUADAS-2) scores were completed to assess article quality. Eight articles were retrieved for quality assessment and data extraction. Studies investigating diagnostic reliability of physical examination tests for CGH scored poorer on methodological quality (higher risk of bias) than those of diagnostic accuracy. There is sufficient evidence showing high levels of reliability and diagnostic accuracy of the selected physical examination tests for the diagnosis of CGH. The cervical flexion-rotation test (CFRT) exhibited both the highest reliability and the strongest diagnostic accuracy for the diagnosis of CGH.

Keywords: Cervicogenic headache, Physical examination, Diagnostic accuracy, Reliability

**45 C. MANUAL THERAPY THORACIC****Pain sensitivity****Cervical & thoracic manipulations: Acute effects upon pain pressure threshold and self-reported pain in experimentally induced shoulder pain**

Craig A. Wassinger Dustin Rich, Nicholas Cameron, Shelley Clark, Scott Davenport, Maranda Lingelbach, Albert Smith, G. David Baxter, Joshua Davidson

**Highlights**

- We examined the effect cervical and thoracic manipulations on experimental shoulder pain.
- An external rotation eccentric exercise protocol caused mild shoulder pain.
- Self-reported shoulder pain was reduced immediately following manipulations.
- Pain pressure threshold over infraspinatus increased bilaterally after manipulations.

**Abstract****Background**

Emerging evidence suggests that cervical and thoracic joint manipulations may be advocated in treating patients with shoulder pain.

**Objectives**

To determine the acute effects of cervical, cervicothoracic, and thoracic joint manipulations on outcomes of self-reported pain and pain pressure threshold in experimentally induced shoulder pain.

**Design**

Repeated measures.

**Methods**

Twenty (20) healthy volunteers were tested on two sessions. Session 1 consisted on baseline assessment of pain pressure threshold testing over the infraspinatus bilaterally and self-reported shoulder pain using the shoulder pain and disability index (SPADI) pain scale. An isokinetic exercise protocol was used to induce delayed onset muscle soreness. In session 2 (24–48 h later), all variables were reassessed before and immediately after a combination of cervical, cervicothoracic and thoracic manipulations.

**Results**

SPADI pain scale scores were significantly different between time points ( $p < 0.001$ ): the exercise protocol significantly increased reported pain [mean increase 14.1,  $p < 0.001$ ] while the manipulation significantly decreased reported pain (mean decrease 5.60,  $p < 0.001$ ) although pain remained higher than baseline levels. Pain pressure threshold differences were also found between time points ( $p = 0.001$ ): manipulation significantly increased pain threshold bilaterally ( $p < 0.001$ ) similar to baseline levels.

**Conclusions**

Cervical, cervicothoracic, and thoracic joint manipulations acutely increased pain pressure threshold and decreased self-reported shoulder pain in participants with experimentally induced shoulder pain. Physiotherapists may consider the combination of such techniques to achieve short-term hypoalgesic effects and facilitate the application of more active interventions.

Keywords: Experimental shoulder pain, Cervical and thoracic manipulation, Manual therapy

**45 D. MANUAL THERAPY EXTREMITIES****GH inferior glide mob****In-vivo measurements of force and humeral movement during inferior glenohumeral mobilizations**

Dexter W. Witt<sup>1</sup>, Nancy R. Talbott

**Highlights**

- •Humeral movement occurring with inferior mobilization has acceptable reliability.
- •Forces applied during different grades of shoulder mobilization are consistent.
- •Humeral movement significantly differs during different grades of mobilization.

**Abstract****Background**

Inferior joint mobilization has been proposed as an assessment technique and an intervention for individuals with shoulder dysfunctions. While such techniques are common, few quantitative in vivo measures of manual movement of the humeral head have been reported.

**Objective**

The purpose of this study was to measure in vivo inferior translational movements occurring in the glenohumeral joint during manual mobilization techniques and to determine the intratester reliability of those inferior translational movements.

**Design**

Cross sectional reliability study.

**Methods**

Twenty three healthy volunteers participated. Subjects were positioned supine with the shoulder in 55 degrees of abduction and 30 degrees of horizontal adduction. Visualizing the humeral head and the acromion, ultrasound images of the superior aspect of the glenohumeral joint were taken with the arm at rest and as an examiner applied a grade 1, a grade 2 and a grade 3 inferior mobilization. This process was repeated three times on each shoulder. Humeral head position was measured in reference to the superior aspect of the acromion and the amount of inferior movement determined by the distance the humeral head moved from the rest position.

**Results**

The mean differences between the rest position and a grade 1, a grade 2 and a grade 3 mobilization were 0.96 mm, 2.44 mm and 3.64 mm respectively. Intraclass correlation coefficients (ICC) for movements were moderate for grade one (ICC = 0.681) and good for grade 2 (0.889) and grade 3(0.898).

**Conclusions**

Results support the ability of one examiner to reliably reproduce three different grades of inferior mobilization.

Keywords:

Glenohumeral joint, Inferior mobilization, Ultrasound imaging



## MT and ex in OA

**The Incremental Effects of Manual Therapy or Booster Sessions in Addition to Exercise Therapy for Knee Osteoarthritis: A Randomized Clinical Trial**

**Authors:** J. Haxby Abbott, DPT, PhD, FNZCP<sup>1</sup>, Catherine M. Chapple, PT, MManipPhty, PhD<sup>2</sup>, G. Kelley Fitzgerald, PT, PhD, FAPTA<sup>3</sup>, Julie M. Fritz, PT, PhD, ATC<sup>4</sup>, John D. Childs, PT, PhD<sup>5</sup>, Helen Harcombe, BPhy, MPH, PhD<sup>1,6</sup>, Kirsten Stout, RN<sup>1</sup>

**Level of Evidence** Therapy, level 1b. *J Orthop Sports Phys Ther*, Epub 28 Sep 2015.  
doi:10.2519/jospt.2015.6015

**Study Design** A factorial randomized controlled trial.

**Objectives** To investigate the addition of manual therapy to exercise therapy for the reduction of pain and increase of physical function in people with knee osteoarthritis (OA), and whether “booster sessions” compared to consecutive sessions may improve outcomes.

**Background** The benefits of providing manual therapy in addition to exercise therapy, or of distributing treatment sessions over time using periodic booster sessions, in people with knee OA are not well established.

**Methods** All participants had knee OA and were provided 12 sessions of multimodal exercise therapy supervised by a physical therapist. Participants were randomly allocated to 1 of 4 groups: exercise therapy in consecutive sessions, exercise therapy distributed over a year using booster sessions, exercise therapy plus manual therapy without booster sessions, and exercise therapy plus manual therapy with booster sessions. The primary outcome measure was the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC score; 0-240 scale) at 1-year follow-up. Secondary outcome measures were the numeric pain-rating scale and physical performance tests.

**Results** Of 75 participants recruited, 66 (88%) were retained at 1-year follow-up. Factorial analysis of covariance of the main effects showed significant benefit from booster sessions ( $P = .009$ ) and manual therapy ( $P = .023$ ) over exercise therapy alone. Group analysis showed that exercise therapy with booster sessions (WOMAC score,  $-46.0$  points; 95% confidence interval [CI]:  $-80.0, -12.0$ ) and exercise therapy plus manual therapy (WOMAC score,  $-37.5$  points; 95% CI:  $-69.7, -5.5$ ) had superior effects compared with exercise therapy alone. The combined strategy of exercise therapy plus manual therapy with booster sessions was not superior to exercise therapy alone.

**Conclusion** Distributing 12 sessions of exercise therapy over a year in the form of booster sessions was more effective than providing 12 consecutive exercise therapy sessions. Providing manual therapy in addition to exercise therapy improved treatment effectiveness compared to providing 12 consecutive exercise therapy sessions alone. Trial registered with the Australian New Zealand Clinical Trials Registry (ACTRN12612000460808).

**Keyword:** arthralgia, OA, physical therapy techniques, randomized controlled trial

**48 A. STM****Trigger point and MET****The effect of the combination of dry needling and MET on latent trigger point upper trapezius in females**

Ameneh Yeganeh Lari, Farshad Okhovatian , Sedigheh sadat Naimi, Alireza Akbarzadeh Baghban

**Highlights**

- The effectiveness of DN and MET for treating the latent MTrPs in upper trapezius.
- Sixty patients were randomly divided into 3 groups i.e., DN with MET, MET, and DN.
- The variables have been measured after treatment protocols, were VAS, PPT & CLF.
- The significant recovery (all variables) in DN & MET; compare with two others.
- No significant differences between only DN & only MET groups in VAS, PPT and CLF.

**Abstract****Aim**

The purpose of this clinical trial experiment was to compare the effects of the combination of dry needling (DN) and the muscle energy technique (MET) on the upper trapezius latent myofascial trigger point.

**Method**

Sixty female patients, aged 18–30 with latent myofascial trigger points in the upper trapezius muscle were randomly divided into three groups: group 1 (n = 20) received DN and MET, group 2 (n = 20) received only MET, and group 3 (n = 20) received only DN. The visual analogue scale (VAS), pressure pain threshold (PPT), and range of active contra lateral flexion (CLF) were measured before each treatment. The patients were treated for three sessions in a one-week period with at least a two-day break between each session, and in session four, an assessment of primary outcomes was conducted without any treatment.

**Results**

All three treatment groups showed decreases in pain ( $p = 0.001$ ) and increases in PPT levels ( $p = 0.001$ ) as well as increases in CLF ( $p = 0.001$ ). But the group receiving trigger point DN together with MET showed more significant improvement than the other two groups in VAS, PPT and ROM. No significant differences were found between the MET-only group and the DN-only group.

**Conclusion**

Our results indicate that all three treatments used in this study were effective for treating MTP. According to this study, DN and MET is suggested as a new method for the treatment of MTP.

**Keywords:**

Myofascial pain syndromes, Trigger point, MET, Dry needling

**TP massage**

BMC Musculoskelet Disord. 2015 Sep 28;16(1):265. doi: 10.1186/s12891-015-0729-5.

**Pain pressure threshold of a muscle tender spot increases following local and non-local rolling massage.**

Aboodarda SJ<sup>1</sup>, Spence AJ<sup>2</sup>, Button DC<sup>3,4</sup>.

Author information

Abstract

**BACKGROUND:**

The aim of the present study was to determine the acute effect of rolling massage on pressure pain threshold (PPT) in individuals with tender spots in their plantar flexor muscles.

**METHODS:**

In a randomized control trial and single blinded study, tender spots were identified in 150 participants' plantar flexor muscles (gastrocnemius or soleus). Then participants were randomly assigned to one of five intervention groups (n = 30): 1) heavy rolling massage on the calf that exhibited the higher tenderness (Ipsi-R), 2) heavy rolling massage on the contralateral calf (Contra-R), 3) light stroking of the skin with roller massager on the calf that exhibited the higher tenderness (Sham), 4) manual massage on the calf that exhibited the higher tenderness (Ipsi-M) and 5) no intervention (Control). PPT was measured at 30 s and up to 15 min post-intervention via a pressure algometer.

**RESULTS:**

At 30 s post-intervention, the Ipsi-R (24 %) and Contra-R (21 %) demonstrated higher ( $p < 0.03$ ) PPT values compared with Control and Sham. During 15 min post-intervention, PPT was higher ( $p < 0.05$ ) following Ipsi-R (19.2 %), Contra-R (15.9 %) and Ipsi-M (10.9 %) compared with Control. There was no difference between the effects of three deep tissue massages (Ipsi-R, Ipsi-M and Contra-R) on PPT.

**DISCUSSION:**

Whereas the increased PPT following ipsilateral massage (Ipsi-R and Ipsi-M) might be attributed to the release of fibrous adhesions; the non-localized effect of rolling massage on the contralateral limb suggests that other mechanisms such as a central pain-modulatory system play a role in mediation of perceived pain following brief tissue massage.

**CONCLUSION:**

Overall, rolling massage over a tender spot reduces pain perception.

**TRIAL REGISTRATION:**

ClinicalTrials.gov ( NCT02528812 ), August 19(th), 2015.

PMID: 26416265

**53. CORE****Stab ex and scoliosis**

Pediatr Phys Ther. 2015 Winter;27(4):396-402. doi: 10.1097/PEP.0000000000000174.

**Spinal Stabilization Exercise Effectiveness for Low Back Pain in Adolescent Idiopathic Scoliosis: A Randomized Trial.**

Zapata KA<sup>1</sup>, Wang-Price SS, Sucato DJ, Thompson M, Trudelle-Jackson E, Lovelace-Chandler V.

Author information

Abstract

**PURPOSE:**

To compare 8 weeks of weekly supervised spinal stabilization exercises with 1-time treatment in participants with low back pain and adolescent idiopathic scoliosis.

**METHODS:**

Participants were randomly assigned to the supervised or unsupervised group. Seventeen participants in the supervised group received weekly physical therapy, and 17 participants in the unsupervised group received a 1-time treatment followed by home exercises.

**RESULTS:**

Significant between-group differences were found in the Numeric Pain Rating Scale and the Patient-Specific Functional Scale scores after 8 weeks ( $P < .01$ ), indicating the supervised group had significantly more pain reduction and functional improvements than the unsupervised group. However, no between-group differences were found in back muscle endurance, the revised Oswestry Back Pain Disability Questionnaire scores, or the Global Rating of Change scores.

**CONCLUSIONS:**

Supervised physical therapy may be more effective than 1-time treatment in reducing pain and improving function in patients with adolescent idiopathic scoliosis and low back pain.

**VIDEO ABSTRACT:**

For more insights from the authors, access Supplemental Digital Content 1, at <http://links.lww.com/PPT/A85>.

PMID:26397085

**56. ATHLETICS****Inflammation in**

Clin Physiol Funct Imaging. 2015 Sep 16. doi: 10.1111/cpf.12299.

**Body composition, maximal aerobic performance and inflammatory biomarkers in endurance-trained athletes.**

Jürimäe J<sup>1</sup>, Tillmann V<sup>2</sup>, Purge P<sup>1</sup>, Jürimäe T<sup>1</sup>.

Author information

**Abstract**

This study was designed to examine the relationships between body composition, cardiorespiratory fitness and simultaneously measured inflammatory parameters in endurance-trained athletes. In 20 well-trained rowers ( $19.0 \pm 2.9$  years;  $185.6 \pm 4.8$  cm;  $85.7 \pm 10.8$  kg;  $17.1 \pm 5.1\%$  body fat; maximal oxygen consumption [ $\text{VO}_2 \text{ max}$ ]:  $63.9 \pm 8.5$  ml min<sup>-1</sup> kg<sup>-1</sup>), body composition was measured by dual-energy X-ray absorptiometry and cardiorespiratory fitness by direct  $\text{VO}_2 \text{ max}$  test. Twelve inflammatory factors [interleukin (IL)-2, IL-4, IL-6, IL-8, IL-10, vascular endothelial growth factor, interferon-gamma (IFN- $\gamma$ ), tumour necrosis factor-alpha, IL-1 $\alpha$ , IL-1 $\beta$ , monocyte chemoattractant protein-1 (MCP-1), epidermal growth factor (EGF)] were analysed from serum samples. Serum IFN- $\gamma$  was related ( $P < 0.05$ ) to fat-free mass (FFM) ( $r = -0.56$ ) and muscle mass ( $r = -0.50$ ). The stepwise regression analysis showed that IFN- $\gamma$  explained 27.5%, and IFN- $\gamma$  and IL-6 together explained 39.8% of the variability of FFM, while IFN- $\gamma$  explained 21.1%, and IFN- $\gamma$  together with EGF explained 36.6% of the variability of muscle mass in male rowers. Serum IL-8 ( $r = -0.65$ ) and VEGF ( $r = -0.48$ ) correlated ( $P < 0.05$ ) with  $\text{VO}_2 \text{ max}$  kg<sup>-1</sup>. Serum IL-8 explained 38.5% of the variability of  $\text{VO}_2 \text{ max}$  kg<sup>-1</sup>. Significant correlations were also found among several inflammatory parameters, indicating that various inflammatory cytokines act on the body as an ensemble.

In conclusion, this cross-sectional study in endurance-trained male rowers showed that FFM and muscle mass were negatively correlated with serum IFN- $\gamma$  level, whereas cardiorespiratory fitness was negatively related to serum IL-8 level.

**KEYWORDS:** body composition; inflammatory profile; maximal aerobic performance; rowers  
PMID:26373614

**57. GAIT****Posture and gait****Is Trunk Posture in Walking a Better Marker than Gait Speed in Predicting Decline in Function and Subsequent Frailty?**

Reshma A. Merchant, MBBS, MRCP Subhasis Banerji, PhD Gautam Singh, MSc Effie Chew, MBBS, MRCP Chueh L. Poh, PhD Sarah C. Tapawan, MRCPCH Yan R. Guo, BSc Yu W. Pang, Dip Mridula Sharma, PhD Ravi Kambadur, PhD Stacey Tay, MBBS, MMed (Paeds), FRCPCH

Many recent guidelines and consensus on sarcopenia have incorporated gait speed and grip strength as diagnostic criteria without addressing early posture changes adopted to maintain gait speed before weakness is clinically evident.

**Objectives**

Older adults are known to compensate well for declining physiological reserve through environmental modification and posture adaptation. This study aimed to analyze and identify significant posture adaptation in older adults that is required to maintain gait speed in the face of increasing vulnerability. This would be a useful guide for early posture correction exercise interventions to prevent further decline, in addition to traditional gait, balance, and strength training.

**Design**

A community-based cross-sectional study.

**Setting and Participants**

The participants comprised 90 healthy community-dwelling Chinese men between the ages of 60 and 80 years and 20 Chinese adults between the ages of 21 and 50 years within the normal BMI range as a comparison group.

**Measurements**

All the participants underwent handgrip strength testing, 6-minute walk, timed up-and-go (TUG), and motion analysis for gait characteristics. Low function was characterized by slow walking speed (<1.0 m/s) and/or slow TUG (>10 seconds), whereas low strength was determined by hand grip dynamometer testing (<26 kg). The degree of frailty was classified using the Canadian Study for Health and Ageing Clinical Frailty Scale (CSHA-CFS) to differentiate between healthy and vulnerable older adults.

**Results**

As expected, the vulnerable older adults had lower functional performance and strength compared with the healthy older adults group. However, a significant number demonstrated posture adaptations in walking in all 3 groups, including those who maintained a good walking speed (>1.0 m/s). The extent of such adaptation was larger in the vulnerable group as compared with the healthy group.

**Conclusion**

Although gait speed is a robust parameter for screening older adults for sarcopenia and frailty, our data suggest that identifying trunk posture adaptation before the onset of decline in gait speed will help in planning interventions in the at-risk community-dwelling older adults even before gait speed declines.

**Keywords:**

Sarcopenia, frailty, gait speed, walking speed, posture adaptation, gait analysis, falls

**Gait after ACL**

BMC Musculoskelet Disord. 2015 Sep 28;16(1):266. doi: 10.1186/s12891-015-0726-8.

**Three-dimensional kinematic analysis of ankle, knee, hip, and pelvic rotation during gait in patients after anterior cruciate ligament reconstruction - early results.**

Czamara A<sup>1,2</sup>, Markowska I<sup>3,4</sup>, Hagner-Derengowska M<sup>5,6</sup>.  
Author information

## Abstract

**BACKGROUND:**

The goal of this study was to biomechanically assess tibial rotation in the knee joint simultaneous changes in rotation of large joints of the lower limbs and pelvis during gait in patients during early postoperative stages following anterior cruciate ligament (ACLR) reconstruction. We hypothesized that tibial rotation is associated with changes in rotation of the large joints of the lower limbs and the pelvis during gait in patients after ACLR reconstruction.

**METHODS:**

The patients were divided into two groups. The ACLR group (n = 32 males) underwent primary ACLR in one leg and postoperative physiotherapy. The control group (n = 30 males) had no knee injuries. After clinical assessment in both groups, the values of kinematic parameters of foot, tibial, femoral, and pelvic rotation were measured during gait on a flat surface using the three-dimensional BTS Smart System. In the ACLR group, measurements were taken during the 4th, 9th, and 14th weeks of postoperative physiotherapy. The results of the ACLR group were compared with those of the control group.

**RESULTS:**

During gait, between the 9th and 14th weeks following ACLR, there are normal values of foot, tibia, and pelvic rotation in the operated legs compared with results obtained from un-operated legs and the control group.

**DISCUSSION:**

Analysis of rotations occurring only in knee joints does not reflect all of the multiarticular disorders of gait kinematics. The study also suggests that analyzing tibial rotation in the knee joint with simultaneous changes in rotation in large joints of the lower limbs provides better opportunities than singular analysis of rotation in the knee joint for the assessment of disorders in gait kinematics.

**CONCLUSIONS:**

In gait, at the maximal extension of the knee during preparation for the stance phase, external hip rotation patterns have not been fully restored 14 weeks after ACLR.

PMID:26416119

**Optimizing gait****Humans Can Continuously Optimize Energetic Cost during Walking**

Jessica C. Selinger Shawn M. O'Connor Jeremy D. Wong J. Maxwell Donelan

## Comments

To view the full text, please login as a subscribed user or purchase a subscription. Click here to view the full text on ScienceDirect.

## Highlights

- People readily adapt established gait patterns to minimize energy use
- People converge on new energetic optima within minutes, even for small cost savings
- Updated predictions about energetically optimal gaits allow re-convergence within seconds
- Energetic cost is not just an outcome of movement, but also continuously shapes it

## Summary

People prefer to move in ways that minimize their energetic cost [ 1–9 ]. For example, people tend to walk at a speed that minimizes energy use per unit distance [ 5–8 ] and, for that speed, they select a step frequency that makes walking less costly [ 3, 4, 6, 10–12 ]. Although aspects of this preference appear to be established over both evolutionary [ 9, 13–15 ] and developmental [ 16 ] timescales, it remains unclear whether people can also optimize energetic cost in real time. Here we show that during walking, people readily adapt established motor programs to minimize energy use. To accomplish this, we used robotic exoskeletons to shift people's energetically optimal step frequency to frequencies higher and lower than normally preferred. In response, we found that subjects adapted their step frequency to converge on the new energetic optima within minutes and in response to relatively small savings in cost (<5%). When transiently perturbed from their new optimal gait, subjects relied on an updated prediction to rapidly re-converge within seconds. Our collective findings indicate that energetic cost is not just an outcome of movement, but also plays a central role in continuously shaping it.



**59. PAIN****Myofascial pain syndrome**

Pain Med. 2015 Sep 26. doi: 10.1111/pme.12919. [Epub ahead of print]

**Effect of Deep Intramuscular Stimulation and Transcranial Magnetic Stimulation on Neurophysiological Biomarkers in Chronic Myofascial Pain Syndrome.**

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Author information

Abstract

**OBJECTIVE:**

The aim was to assess the neuromodulation techniques effects (repetitive transcranial magnetic stimulation [rTMS] and deep intramuscular stimulation therapy [DIMST]) on pain intensity, peripheral, and neurophysiological biomarkers chronic myofascial pain syndrome (MPS) patients.

**DESIGN:**

Randomized, double blind, factorial design, and controlled placebo-sham clinical trial.

**SETTING:**

Clinical trial in the Laboratory of Pain and Neuromodulation at Hospital de Clínicas de Porto Alegre (NCT02381171).

**SUBJECTS:**

We recruited women aged between 19- and 75-year old, with MPS diagnosis.

**METHODS:**

Patients were randomized into four groups: rTMS + DIMST, rTMS + sham-DIMST, sham-rTMS + DIMST, sham-rTMS + sham-DIMST; and received 10 sessions for 20 minutes each one (rTMS and DIMST). Pain was assessed by visual analogue scale (VAS); neurophysiological parameters were assessed by transcranial magnetic stimulation; biochemical parameters were: BDNF, S100 $\beta$ , lactate dehydrogenase, inflammatory (TNF- $\alpha$ , IL6, and IL10), and oxidative stress parameters.

**RESULTS:**

We observed the pain relief assessed by VAS immediately assessed before and after the intervention ( $P < 0.05$ ,  $F_{(1,3)} = 3.494$  and  $F_{(1,3)} = 4.656$ , respectively); in the sham-rTMS + DIMST group and both three active groups in relation to sham-rTMS + sham-DIMST group, respectively. There was an increase in the MEP after rTMS + sham-DIMST ( $P < 0.05$ ). However, there was no change in all-peripheral parameters analyzed across the treatment ( $P > 0.05$ ).

**CONCLUSION:**

Our findings add additional evidence about rTMS and DIMST in relieving pain in MPS patients without synergistic effect. No peripheral biomarkers reflected the analgesic effect of both techniques; including those related to cellular damage. Additionally, one neurophysiological parameter (increased MEP amplitude) needs to be investigated.

**KEYWORDS:** BDNF; Myofascial Pain; Oxidative Parameters

PMID: 26408420

Chronic pain and behavior therapy

Pain Med. 2015 Oct 6. doi: 10.1111/pme.12929.

**Cognitive-Motivational Influences on Health Behavior Change in Adults with Chronic Pain.**

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Author information

Abstract

**OBJECTIVE:**

The primary aim was to assess the psychological factors that influence engagement in health behaviors in individuals with chronic pain using a new measure, the Behavioral Engagement Test for Chronic Pain (BET-CP). A secondary aim was to determine preliminary psychometric properties of the BET-CP.

**SUBJECTS:**

Participants were 86 adults with chronic musculoskeletal pain recruited from University of Florida pain clinics and the community.

**METHODS:**

Participants completed a battery of self-report instruments online, including the BET-CP and measures of related constructs. Items on the BET-CP assessed motivation, self-efficacy, outcome expectations, and the symptom benefit required to engage across four health behaviors: exercise, diet, sleep, and pain self-management (e.g., relaxation and activity pacing).

**RESULTS:**

Participants reported modest expectations of pain-related symptom improvement if they practiced the health behaviors (22-26% improvement), but they required twice that (47-54% improvement) to make it worth their while to commit to practicing them. Participants expected to get the most symptom relief from relaxation and activity pacing, but they were most confident and motivated to eat a healthy diet. In a subsample of participants who provided data for psychometric analysis, the BET-CP demonstrated strong test-retest reliability across 7 days and adequate convergent validity.

**CONCLUSION:**

While patients with musculoskeletal pain have outcome expectancies that are nearly in line with research on behavioral pain treatments, their stringent requirements for symptom benefit may impede engagement in the health behaviors recommended for their pain-related symptoms. Additional psychometric study with larger sample sizes is needed to further validate the BET-CP.

**KEYWORDS:** Behavior; Exercise; Expectation; Motivation; Psychology; Self-efficacy

PMID:26441145

**Smaller amygdala**

J Pain. 2015 Sep 29. pii: S1526-5900(15)00881-0. doi: 10.1016/j.jpain.2015.08.012.

**Smaller amygdala volumes in patients with chronic low back pain as compared to healthy control subjects.**

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Author information

**Abstract**

Although preclinical and clinical data strongly support an association between amygdala and chronic pain by the presence of mood and cognitive disturbances in affected individuals, little attention has been paid to morphometric measurement of the structure in patients with chronic low back pain (CLBP). In the present study, MR volumetric and surface analysis, using FMRIB's integrated registration and segmentation tool (FIRST), were performed to compare structural MR imaging data obtained from 33 patients with CLBP to those obtained from 33 demographically similar healthy controls. Our results indicated that the normalized volumes of the left and right amygdala were significantly smaller in the CLBP group than in the control group. Detailed surface analyses further localized these differences. The degree of volume reduction was different between the left and right amygdala, with a greater involvement of the left one. Both groups exhibited similar significant hemispheric asymmetry for the amygdala (left greater than right). Similar asymmetry were suggested in the subgroup of 24 un-medicated patients. No significant correlations were found between amygdala volumes and pain characteristics and/or depressive symptoms. Our study provides in vivo imaging evidence of abnormal morphology of the amygdala in patients with CLBP using a fully automated segmentation method.

***PERSPECTIVE:***

Our study found that patients with CLBP had statistically significantly smaller normalized volumes of the bilateral amygdala, as compared with the healthy controls, with a greater involvement of the left side. These results may help to characterize the impaired affective-cognitive dimension in patients with chronic pain.

**KEYWORDS:** FSL-FIRST; amygdala; chronic low back pain; morphology

PMID:26431880

**Sleep, stress and pain in older adults**

Int J Geriatr Psychiatry. 2015 Sep 30. doi: 10.1002/gps.4349.

**Pain grade and sleep disturbance in older adults: evaluation the role of pain, and stress for depressed and non-depressed individuals.**

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Author information

Abstract

**OBJECTIVE:**

The aim of this paper was to assess the relationship between pain and sleep in older adults taking depression, stress, and medical comorbidities into account.

**METHODS:**

A cross-sectional analysis was performed using Einstein Aging Study, a community-based cohort study of adults aged 70 years and older. Ratings of pain intensity and interference from the Medical Outcomes Study (MOS) Short-Form 36 were used to assign individuals to low-pain versus high-pain severity. Sleep disturbance was assessed using the nine-item sleep problems index from the Medical Outcomes Study Sleep Scale. Other measures included the Geriatric Depression Scale and Perceived Stress Scale (PSS). Linear regression models were used to assess the association between pain grade and sleep disturbance adjusted for demographics, PSS, Geriatric Depression Scale, and other comorbidities.

**RESULTS:**

Five hundred sixty-two eligible participants with a mean age of 78.22 years (standard deviation = 5.43) were included; 64% were women. Pain grade [ $\beta = 5.40$ , 95% confidence interval (CI) 2.56-8.21,  $p < 0.001$ ] was associated with sleep disturbance after adjusting for demographic variables. In models including pain grade ( $\beta = 3.08$ , 95% CI 0.32-5.85,  $p = 0.03$ ) and PSS ( $\beta = 0.57$ , 95% CI 0.39-0.75,  $p < 0.001$ ), both were associated with sleep disturbance, although the PSS attenuated the relationship between pain and sleep by 34%. Depression, when added to previous model, was also associated with sleep ( $\beta = 2.17$ , 95% CI 1.48-2.85,  $p < 0.001$ ) and attenuated the relationship between pain ( $\beta = 2.41$ , 95% CI -0.25 to 5.08,  $p = 0.07$ ) and sleep by 22%. Stratified for depression, we found that pain, stress, and other medical comorbidities were significantly associated with sleep disturbance in non-depressed individuals but not individuals with depression.

**CONCLUSIONS:**

Pain, stress, and medical comorbidities are associated with sleep disturbance, especially in non-depressed older adults.

**KEYWORDS:** depression; pain intensity; pain interference; sleep problems index; stress  
PMID:26422058

## 61. FIBROMYALGIA

### Opioid use in FM

Pain Pract. 2015 Oct 7. doi: 10.1111/papr.12364.

#### Evaluating Guideline-recommended Pain Medication Use Among Patients with Newly Diagnosed Fibromyalgia.

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Author information

Abstract

#### **OBJECTIVES:**

To compare pain medication treatment changes across cohorts of newly diagnosed patients with fibromyalgia (FM) treated with guideline-recommended medications or opioids.

#### **METHODS AND DESIGN:**

Retrospective claims data analysis examined adult commercial health plan members newly diagnosed with FM (initial diagnosis = index date) from January 2008 to February 2012. Patients had 6-month pre-index and 12-month postindex periods and received pain medication within 6 months postindex; cohorts were based on the first postindex medication. Guideline-recommended medication cohorts were anti-epileptic drug (AED), serotonin-norepinephrine reuptake inhibitor (SNRI), selective serotonin reuptake inhibitor (SSRI), and tricyclic antidepressant (TCA). Short-acting and long-acting opioid (SAO, LAO) cohorts were also identified. Pairwise comparisons with the SAO cohort were conducted. Cox proportional hazards regressions modeled the likelihood of receiving guideline-recommended therapy.

#### **RESULTS:**

The final sample was 96,175 patients (mean age 47.3 years; 72.5% female), distributed into SAO (57%), SSRI (22%), AED (10%), SNRI (6%), TCA (3%), and LAO (2%) cohorts. The SAO cohort had the most discontinuation (49% vs. 6% to 22%,  $P < 0.01$ ) and the least augmentation (29% vs. 35% to 50%,  $P < 0.01$ ). Regression analyses indicated that patients with (vs. without) pre-index guideline-recommended medications were 2 to 4 times more likely to receive them postindex. Patients in the opioid cohorts were about half as likely to receive subsequent guideline-recommended medications.

#### **CONCLUSIONS:**

Opioid use was widespread among patients with FM. Once patients received opioids postdiagnosis, the likelihood of receiving guideline-recommended medications was small. These real-world results indicate an opportunity may exist for improved FM management using recommended therapies in clinical practice.

**KEYWORDS:** adherence; fibromyalgia; guidelines; opioid use; pain; therapeutics

PMID:26443495

**62 A. NUTRITION/VITAMINS**

**Vit D and cognitive function**

JAMA Neurol. 2015 Sep 14. doi: 10.1001/jamaneurol.2015.2115.

**Vitamin D Status and Rates of Cognitive Decline in a Multiethnic Cohort of Older Adults.**

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Author information

Abstract

**IMPORTANCE:** Vitamin D (VitD) deficiency is associated with brain structural abnormalities, cognitive decline, and incident dementia.

**OBJECTIVE:** To assess associations between VitD status and trajectories of change in subdomains of cognitive function in a cohort of ethnically diverse older adults.

**DESIGN, SETTING, AND PARTICIPANTS:** Longitudinal multiethnic cohort study of 382 participants in an outpatient clinic enrolled between February 2002 and August 2010 with baseline assessment and yearly follow-up visits. Serum 25-hydroxyvitamin D (25-OHD) was measured, with VitD status defined as the following: deficient, less than 12 ng/mL (to convert to nanomoles per liter, multiply by 2.496); insufficient, 12 to less than 20 ng/mL; adequate, 20 to less than 50 ng/mL; or high, 50 ng/mL or higher. Subdomains of cognitive function were assessed using the Spanish and English Neuropsychological Assessment Scales. Associations were evaluated between 25-OHD levels (as continuous and categorical [deficient, insufficient, or adequate]) and trajectories of cognitive decline.

**MAIN OUTCOMES AND MEASURES:** Serum 25-OHD levels, cognitive function, and associations between 25-OHD levels and trajectories of cognitive decline.

**RESULTS:** Participants (N = 382 at baseline) had a mean (SD) age of 75.5 (7.0) years; 61.8% were women; and 41.4% were white, 29.6% African American, 25.1% Hispanic, and 3.9% other race/ethnicity. Diagnosis at enrollment included 17.5% with dementia, 32.7% with mild cognitive impairment, and 49.5% cognitively normal. The mean (SD) 25-OHD level was 19.2 (11.7) ng/mL, with 26.2% of participants being VitD deficient and 35.1% insufficient. The mean (SD) 25-OHD levels were significantly lower for African American and Hispanic participants compared with white participants (17.9 [15.8] and 17.2 [8.4] vs 21.7 [10.0] ng/mL, respectively;  $P < .001$  for both). The mean (SD) 25-OHD levels were similarly lower in the dementia group compared with the mild cognitive impairment and cognitively normal groups (16.2 [9.4] vs 20.0 [10.3] and 19.7 [13.1] ng/mL, respectively;  $P = .006$ ). The mean (SD) follow-up was 4.8 (2.5) years. Rates of decline in episodic memory and executive function among VitD-deficient (episodic memory:  $\beta = -0.04$  [SE = 0.02],  $P = .049$ ; executive function:  $\beta = -0.05$  [SE = 0.02],  $P = .01$ ) and VitD-insufficient (episodic memory:  $\beta = -0.06$  [SE = 0.02],  $P < .001$ ; executive function:  $\beta = -0.04$  [SE = 0.02],  $P = .008$ ) participants were greater than those with adequate status after controlling for age, sex, education, ethnicity, body mass index, season of blood draw, vascular risk, and apolipoprotein E4 genotype. Vitamin D status was not significantly associated with decline in semantic memory or visuospatial ability. Exclusion of participants with dementia did not substantially affect the associations between VitD status and rates of cognitive decline.

**CONCLUSIONS AND RELEVANCE:** Low VitD status was associated with accelerated decline in cognitive function domains in ethnically diverse older adults, including African American and Hispanic individuals who exhibited a high prevalence of VitD insufficiency or deficiency. It remains to be determined whether VitD supplementation slows cognitive decline.

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