

## ABSTRACTS

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## 2. LBP

### Lumbopelvic hip ROM

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

Rae S. Alqhtani Michael D. Jones Peter S. Theobald Jonathan M. Williams

DOI: <http://dx.doi.org/10.1016/j.math.2015.09.014>

#### Highlights

- 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

### 3. DISC

#### Disc degeneration

AJNR Am J Neuroradiol. 2015 Dec;36(12):2394-2399. Epub 2015 Sep 10.

#### **MRI Findings of Disc Degeneration are More Prevalent in Adults with Low Back Pain than in Asymptomatic Controls: A Systematic Review and Meta-Analysis.**

Brinjikji W<sup>1</sup>, Diehn FE<sup>2</sup>, Jarvik JG<sup>3</sup>, Carr CM<sup>2</sup>, Kallmes DF<sup>2</sup>, Murad MH<sup>4</sup>, Luetmer PH<sup>2</sup>.

Author information

Abstract

#### **BACKGROUND AND PURPOSE:**

Imaging features of spine degeneration are common in symptomatic and asymptomatic individuals. We compared the prevalence of MR imaging features of lumbar spine degeneration in adults 50 years of age and younger with and without self-reported low back pain.

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

We performed a meta-analysis of studies reporting the prevalence of degenerative lumbar spine MR imaging findings in asymptomatic and symptomatic adults 50 years of age or younger. Symptomatic individuals had axial low back pain with or without radicular symptoms. Two reviewers evaluated each article for the following outcomes: disc bulge, disc degeneration, disc extrusion, disc protrusion, annular fissures, Modic 1 changes, any Modic changes, central canal stenosis, spondylolisthesis, and spondylolysis. The meta-analysis was performed by using a random-effects model.

#### **RESULTS:**

An initial search yielded 280 unique studies. Fourteen (5.0%) met the inclusion criteria (3097 individuals; 1193, 38.6%, asymptomatic; 1904, 61.4%, symptomatic). Imaging findings with a higher prevalence in symptomatic individuals 50 years of age or younger included disc bulge (OR, 7.54; 95% CI, 1.28-44.56;  $P = .03$ ), spondylolysis (OR, 5.06; 95% CI, 1.65-15.53;  $P < .01$ ), disc extrusion (OR, 4.38; 95% CI, 1.98-9.68;  $P < .01$ ), Modic 1 changes (OR, 4.01; 95% CI, 1.10-14.55;  $P = .04$ ), disc protrusion (OR, 2.65; 95% CI, 1.52-4.62;  $P < .01$ ), and disc degeneration (OR, 2.24; 95% CI, 1.21-4.15,  $P = .01$ ). Imaging findings not associated with low back pain included any Modic change (OR, 1.62; 95% CI, 0.48-5.41,  $P = .43$ ), central canal stenosis (OR, 20.58; 95% CI, 0.05-798.77;  $P = .32$ ), high-intensity zone (OR = 2.10; 95% CI, 0.73-6.02;  $P = .17$ ), annular fissures (OR = 1.79; 95% CI, 0.97-3.31;  $P = .06$ ), and spondylolisthesis (OR = 1.59; 95% CI, 0.78-3.24;  $P = .20$ ).

#### **CONCLUSIONS:**

Meta-analysis demonstrates that MR imaging evidence of disc bulge, degeneration, extrusion, protrusion, Modic 1 changes, and spondylolysis are more prevalent in adults 50 years of age or younger with back pain compared with asymptomatic individuals.

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PMID:26359154

## 5. SURGERY

### Stenosis and posture

#### Post-surgical functional recovery, lumbar lordosis, and range of motion associated with MR-detectable redundant nerve roots in lumbar spinal stenosis

Jinshui Chen<sup>1</sup> Juying Wang<sup>1</sup> Benhai Wang Hao Xu Songqing Lin Huihao Zhang

DOI: <http://dx.doi.org/10.1016/j.clineuro.2015.11.016>

#### Highlights

- To investigate effects of lumbar lordosis angle and range of motion on functional recovery.
- To explore relationship between RNRs apparent on MRI images and clinical measures.
- Elevated lumbar lordosis angle and range of motion increased risks of RNR formation.

#### Abstract

##### Objective

T1- and T2-weighted magnetic resonance images (MRI) can reveal lumbar redundant nerve roots (RNRs), a result of chronic compression and nerve elongation associated with pathogenesis of cauda equina claudication (CEC) in degenerative lumbar canal stenosis (DLCS). The study investigated effects of lumbar lordosis angle and range of motion on functional recovery in lumbar stenosis patients with and without RNRs.

##### Methods

A retrospective study was conducted of 93 lumbar spinal stenosis patients who underwent decompressive surgery. Eligible records were assessed by 3 independent blinded radiologists for presence or absence of RNRs on sagittal T2-weighted MR (RNR and non-RNR groups), pre- and post-operative JOA score, lumbar lordosis angle, and range of motion.

##### Results

Of 93 total patients, the RNR group ( $n = 37$ , 21/37 female) and non-RNR group ( $n = 56$ ; 31/56 female) had similar preoperative conditions (JOA score) and were not significantly different in age (mean  $64.19 \pm 8.25$  vs.  $62.8 \pm 9.41$  years), symptom duration ( $30.92 \pm 22.43$  vs.  $28.64 \pm 17.40$  months), or follow-up periods ( $17.35 \pm 4.02$  vs.  $17.75 \pm 4.29$  mo) (all  $p > 0.4$ ). The non-RNR group exhibited significantly better final JOA score ( $p = 0.015$ ) and recovery rate ( $p = 0.002$ ). RNR group patients exhibited larger lumbar lordosis angles in the neutral position ( $p = 0.009$ ) and extension ( $p = 0.021$ ) and larger range of motion ( $p = 0.008$ ).

##### Conclusions

Poorer surgical outcomes in patients with RNRs indicated that elevated lumbar lordosis angle and range of motion increased risks of RNR formation, which in turn may cause poorer post-surgical recovery, this information is possibly useful in prognostic assessment of lumbar stenosis complicated by RNRs.

**Keywords:** *Redundant nerve roots, Range of motion, Lumbar lordosis, Lumbar spinal stenosis, Cauda equina claudication*

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Prostrate pain and diet

**Prostate Cancer and Prostatic Diseases**, (15 December 2015) | doi:10.1038/pcan.2015.57  
**Association of diet and lifestyle with chronic prostatitis/chronic pelvic pain syndrome and pain severity: a case-control study**

X Chen, C Hu, Y Peng, J Lu, N Q Yang, L Chen, G Q Zhang, L K Tang and J C Dai

Abstract

Background:

Chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) is a common problem with unclear etiology. Some diet and lifestyle factors were thought to correlate with CP/CPPS, but studies comprehensively investigate this correlation are rarely available. The current study was conducted to determine the potential lifestyle-related risk factors of CP/CPPS and its pain severity in Chinese population.

Methods:

Participants were recruited from seven hospitals in Shanghai from July 2012 to August 2013. Demographics, medical history, diet and lifestyle information, and CP/CPPS symptoms were obtained from each participant using a questionnaire. Univariate and multivariate logistic regression analyses were used to identify potential lifestyle-related risk factors for CP/CPPS and its pain severity.

Results:

A total of 784 men with CP/CPPS and 785 controls were enrolled in this study. Multivariate regression model indicated that age, nightshift work, stress, smoking status, alcohol consumption, less water intake, imbalanced diet, frequent sexual activity, delaying ejaculation and holding urine were identified as potential risk factors for CP/CPPS, whereas sedentary lifestyle, caffeinated drinks and less water intake were associated with severe pain in CP/CPPS patients.

**Conclusions:**

Several diet and lifestyle factors associated with CP/CPPS and pain severity were determined in this study. These modifiable conditions are potential targets for treatment of CP/CPPS. However, further studies are necessary to determine their role in the pathogenesis of CP/CPPS.

### Dysmenorrhea and low light therapy

#### **Randomized controlled trial of the efficacy and safety of self-adhesive low-level light therapy in women with primary dysmenorrhea**

International Journal of Gynecology & Obstetrics, 12/15/2015

Hong GH, et al.

**T**he authors want to evaluate the efficacy and safety of low-level light therapy in women with primary dysmenorrhea. Low-level light therapy could be an effective, safe treatment modality for women with primary dysmenorrhea.

#### Methods

- A multicenter prospective, randomized, double-blind, placebo-controlled clinical trial including patients 18–35 years of age with primary dysmenorrhea was undertaken at two university hospitals in South Korea between October 2011 and September 2012.
- Patients were randomized using a computer-generated sequence to receive low-level light therapy using the Color DNA-WSF device or to receive placebo treatment with a dummy device.
- The severity of menstrual pain, assessed using a visual analog scale, was the primary outcome and was evaluated at baseline and during every menstrual cycle for 3 months following treatment.
- Patients who received more than one application of treatment (with a Color DNA-WSF or placebo device) were included in analyses.
- Patients and investigators were masked to the treatment assignments.

#### Results

- Overall, 44 patients were assigned to each group.
- At the final study visit, the reduction in scores using a visual analog scale was significantly greater in patients who received low-level light therapy ( $n = 41$ ;  $4.34 \pm 2.22$ ) than among those in the control group ( $n = 38$ ;  $1.79 \pm 1.73$ ;  $P < 0.001$  when adjusted for age) No serious adverse events occurred.

## 8. VISCERA

### Sleep apnea and GERD

Otolaryngol Head Neck Surg. 2015 Dec 8. pii: 0194599815621557.

#### **Obstructive Sleep Apnea and Gastroesophageal Reflux: A Multivariate Population-Level Analysis.**

Gilani S<sup>1</sup>, Quan SF<sup>2</sup>, Pynnonen MA<sup>3</sup>, Shin JJ<sup>4</sup>.

Abstract

#### **OBJECTIVES:**

Previous studies investigating the relationship between gastroesophageal reflux (GER) and obstructive sleep apnea (OSA) demonstrate mixed results and have had limited capacity to control for concurrent confounders. Our objectives were to (1) determine if GER is significantly associated with OSA when simultaneously adjusting for the presence of other potentially confounding conditions and (2) quantify the magnitude of any such association that exists.

#### **STUDY DESIGN:**

Cross-sectional analysis of the National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, 2005-2010.

#### **SETTING:**

Ambulatory visits in the United States.

#### **SUBJECTS AND METHODS:**

Adults with a diagnosis of OSA or GER and potentially confounding conditions were identified. Univariate and multivariate logistic regression analyses were performed, as well as sensitivity analyses based on increasingly narrow diagnostic definitions.

#### **RESULTS:**

A significant positive association between GER and OSA was observed, which persisted after adjustment for age, sex, race/ethnicity, sinonasal obstructive and inflammatory disorders, laryngopharyngeal obstructive and inflammatory disorders, obesity, asthma, and lung disorders. This positive association remained significant regardless of diagnostic criteria, whether broad (odds ratio: 1.94, 95% confidence interval: 1.07-3.54, P = .030) or narrow (odds ratio: 2.13, 95% confidence interval: 1.17-3.88, P = .014).

#### **CONCLUSION:**

In this analysis of a national database defining the 3 most prioritized diagnoses, GER is independently associated with OSA, with double the odds of concurrent occurrence, even while controlling for potentially related conditions.

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#### **KEYWORDS:**

United States; adult; asthma; comorbidity; esophagitis; gastroesophageal reflux; laryngopharyngeal reflux; lung disease; obesity; obstructive sleep apnea; sleep disorders

PMID: 26645532

## Gluten avoidance

**Diet adherence and gluten exposure in coeliac disease and self-reported non-coeliac gluten sensitivity**

Clinical Nutrition, 12/14/2015

Løvik A, et al.

**O**bjectives of the study were to compare dietary adherence in coeliac disease (CD) subjects and in non-coeliac gluten sensitive (NCGS) subjects, and to estimate gluten exposure based on weighed food records and analysis of gluten content in selected food items. Both CD and NCGS subjects were largely adherent, and adherence did not differ between the groups. Gluten exposure varied greatly, and some CD and NCGS subjects reached gluten intake above 500 mg/day, which might have considerable health effects on the individual, especially in case of celiac disease.

**Methods**

- Twenty-three subjects with biopsy verified CD on a gluten-free diet and 34 HLA-DQ2<sup>+</sup> NCGS subjects on a self-instituted gluten-free diet were enrolled.
- The latter group was under investigation of CD.
- Dietary adherence was assessed by frequency questionnaire and structured forms supplied by weighed food records.
- For the analyses of food samples, the sandwich R5-ELISA, Ridascreen Gliadin competitive method was used.

**Results**

- There was no difference in dietary adherence between CD and NCGS subjects (83 % vs 68 %,  $p = 0.21$ ).
- NCGS subjects were mainly self-educated in gluten-free diet compared to CD subjects (91 % and 39 %, respectively,  $p < 0.001$ ).
- In non-adherent subjects, there was no difference in gluten exposure between CD and NCGS (10 vs 138 mg/day,  $p = 0.83$ ).
- There was no difference in BMR-factor between CD and NCGS subjects, or between adherent and non-adherent subjects

**10 A. CERVICAL SPINE****Motor control and neck pain****Neck motion, motor control, pain and disability: A longitudinal study of associations in neck pain patients in physiotherapy treatment**

Ingebrigt Meisingset Ann-Katrin Stensdotter Astrid Woodhouse Ottar Vasseljen

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.013>

**Highlights**

- A comprehensive set of test for neck motion and motor control was investigated.
- Changes in neck motion and motor control occurred primarily within 2 weeks.
- Few variables were associated with changes in pain and disability.
- Range of motion in the sagittal plane was associated with both pain and disability.

**Abstract****Background**

Neck pain is associated with several alterations in neck motion and motor control, but most of the findings are based on cross-sectional studies.

**Objective**

The aim of this study was to investigate associations between changes in neck motion and motor control, and changes in neck pain and disability in physiotherapy patients during a course of treatment.

**Design**

Prospective cohort study.

**Method**

Subjects with non-specific neck pain (n = 71) participated in this study. Neck flexibility, joint position error (JPE), head steadiness, trajectory movement control and postural sway were recorded before commencement of physiotherapy (baseline), at 2 weeks, and at 2 months. Numerical Rating Scale and Neck Disability Index were used to measure neck pain and disability at the day of testing. To analyze within subjects effects in neck motion and motor control, neck pain, and disability over time we used fixed effects linear regression analysis.

**Results**

Changes in neck motion and motor control occurred primarily within 2 weeks. Reduction in neck pain was associated with increased cervical range of motion in flexion-/extension and increased postural sway when standing with eyes open. Decreased neck disability was associated with some variables for neck flexibility and trajectory movement control. Cervical range of motion in flexion-/extension was the only variable associated with changes in both neck pain and neck disability.

**Conclusions**

This study shows that few of the variables for neck motion and motor control were associated with changes neck pain and disability over a course of 2 months with physiotherapy treatment.

**Keywords:**

Neck pain, Disability, Motor control, Neck motion, Physiotherapy

**Cervical kinematics****Factors associated with cervical kinematic impairments in patients with neck pain**

Julia Treleaven Xiaoqi Chen Hilla Sarig Bahat

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.015>**Highlights**

- There are many potential factors that might influence cervical kinematics.
- Rotation range of motion related most to pain and visual disturbances.
- Rotation velocity related most to visual disturbances and balance.
- These factors should be considered in management.

**Abstract****Background and aim**

Cervical kinematics have functional relevance and are important for assessment and management in patients with neck disorders. A better understanding of factors that might influence cervical kinematics is required. The aim of this study was to determine any relationships between altered kinematics to the symptoms and signs of sensorimotor impairments, neck pain and disability and fear of neck motion in people with neck pain.

**Method**

Kinematics were measured in 39 subjects with chronic neck pain using a customized virtual reality system. Range of cervical motion, mean and peak velocity, time to peak velocity percentage, number of velocity peaks and accuracy were derived. Correlations between these measures to self-reported (neck pain intensity, disability, fear of motion, dizziness, visual disturbances) and sensorimotor measures and regression analyses were conducted.

**Results**

Range and velocity of motion of cervical rotation appeared to be most related to visual disturbances and pain or dynamic balance. Nevertheless these relationships only explained about 30% of the variance of each measure.

**Conclusion**

Signs and symptoms of sensorimotor dysfunction should be considered and monitored in the management of altered cervical rotation kinematics in patients with chronic neck disorders. Future research should consider the effects of addressing these factors on neck kinematics and vice versa to aid functional recovery in those with neck pain.

Keywords: Kinematics, Velocity, Neck pain, Sensorimotor

**Lower trap thickness less on side of pain**

Muscle Nerve. 2015 Dec 11. doi: 10.1002/mus.25014.

**Decreased thickness of the lower trapezius muscle in patients with unilateral neck pain.**

Uthaikhup S<sup>1,2</sup>, Pensri C<sup>1</sup>, Kawsoiy K<sup>1</sup>.

Abstract

**BACKGROUND:**

Thickness of the lower trapezius muscle in patients with neck pain has not been established. We examined the thickness of the lower trapezius muscle in patients with and without unilateral neck pain.

**METHODS:**

Twenty women with unilateral (right) neck pain and 20 matched controls participated in the study. Thickness of the lower trapezius muscles was measured bilaterally at rest (0° and 120° of shoulder abduction) and during contraction (120° of shoulder abduction) using ultrasound imaging.

**RESULTS:**

The neck pain group had smaller thickness of the lower trapezius muscle on the painful side compared to controls both at rest and during contraction ( $P < 0.05$ ). However, the percentage change in the lower trapezius thickness from rest to contraction (120° of shoulder abduction) was not different between groups ( $P > 0.05$ ).

**CONCLUSION:**

Patients with neck pain had smaller thickness of the lower trapezius muscle on the painful side compared to healthy controls. This article is protected by copyright. All rights reserved.

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**KEYWORDS:**

lower trapezius; muscle size; neck pain; scapular muscle; thickness; ultrasound imaging

PMID: 26659617

## Changes in muscle morphology in chronic pain

### Does muscle morphology change in chronic neck pain patients? – A systematic review

R. De Pauw I. Coppieters J. Kregel K. De Meulemeester L. Danneels B. Cagnie

DOI: <http://dx.doi.org/10.1016/j.math.2015.11.006>

#### Highlights

- A systematic review including 14 articles of moderate quality.
- Moderate evidence is available for changes in the neck musculature in neck pain.
- Fatty infiltration is only a feature of patients with whiplash associated disorder.
- Patients with chronic idiopathic neck pain show signs of general disuse.

#### Abstract

##### Background

Neck pain is a common disabling worldwide health problem with a high socio-economic burden. Changes underlying the transition to, or the maintenance of a chronic state are still barely understood. Increasing evidence suggests that morphological muscle changes, including changes in cross-sectional area (CSA) or fatty infiltration, play a role in chronic neck pain. However, a structured overview of the current evidence of morphological changes is lacking.

##### Objective

To systematically review the morphological muscle changes in patients with chronic neck pain, including those with whiplash-associated disorders (WAD) and chronic idiopathic neck pain.

##### Study design & Methods

a systematic review using the PRISMA-guidelines.

##### Results

Fourteen of 395 papers were included after extensive screening. Most studies were of moderate methodological quality. A higher CSA was found in all flexor muscles in both patients with WAD and patients with chronic idiopathic neck pain, except for the deeper flexor muscles in patients with chronic idiopathic neck pain. The cervical extensor muscles show an increased CSA at the highest cervical segments in patients with WAD, while most studies in patients with chronic idiopathic neck pain report a decreased CSA in all extensor muscles. Fatty infiltration, which could be accountable for an increased CSA, of both cervical extensors and flexors seems to occur only in patients with WAD.

##### Conclusion

Some evidence is available for changes in muscle morphology, however more high quality prospective and cross-sectional research is needed to confirm these changes and to identify potential underlying causes that need yet to be discovered. **Keywords:** neck pain, muscle morphology, whiplash, fatty infiltration,

**12 A. WHIPLASH****Balance disorders****Balance, dizziness and proprioception in patients with chronic whiplash associated disorders complaining of dizziness: A prospective randomized study comparing three exercise programs**

Julia Treleaven Gunnel Peterson Maria Landén Ludvigsson Ann-Sofi Kammerlind, Anneli Peolsson

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.017>

**Highlights**

- •Dizziness and unsteadiness are common symptoms following a whiplash injury.
- •We compared 3 exercise programs in patients with chronic whiplash with dizziness.
- •Specific neck exercise, in combination with a behavioural approach, was superior.
- •Symptoms persisted in many, thus management directed towards this is important.

**Abstract****Background**

Dizziness and unsteadiness are common symptoms following a whiplash injury.

**Objective**

To compare the effect of 3 exercise programs on balance, dizziness, proprioception and pain in patients with chronic whiplash complaining of dizziness.

**Design**

A sub-analysis of a randomized study.

**Methods**

One hundred and forty subjects were randomized to either a physiotherapist-guided neck-specific exercise (NSE), physiotherapist-guided neck-specific exercise, with a behavioural approach (NSEB) or prescription of general physical activity (PPA) group. Pre intervention, 3, 6 and 12 months post baseline they completed the University of California Los Angeles Dizziness Questionnaire (UCLA-DQ), Visual Analogue Scales (VAS) for, dizziness at rest and during activity and physical measures (static and dynamic clinical balance tests and head repositioning accuracy (HRA)).

**Results**

There were significant time by group differences with respect to dizziness during activity and UCLA-Q favouring the physiotherapy led neck specific exercise group with a behavioural approach. Within group analysis of changes over time also revealed significant changes in most variables apart from static balance. Conclusion: Between and within group comparisons suggest that physiotherapist led neck exercise groups including a behavioural approach had advantages in improving measures of dizziness compared with the general physical activity group, although many still complained of dizziness and balance impairment. Future studies should consider exercises specifically designed to address balance, dizziness and cervical proprioception in those with persistent whiplash. **Keywords:** Dizziness, Balance, Proprioception, Whiplash

## Manual therapy helpful in Whiplash care

Spine J. 2015 Nov 26. pii: S1529-9430(15)01235-8. doi: 10.1016/j.spinee.2015.08.025.

**Which interventions are cost-effective for the management of whiplash-associated and neck pain-associated disorders? a systematic review of the health economic literature by the ontario protocol for traffic injury management (optima) collaboration.**

van der Velde G<sup>1</sup>, Yu H<sup>2</sup>, Paulden M<sup>3</sup>, Côté P<sup>4</sup>, Varatharajan S<sup>2</sup>, Shearer HM<sup>2</sup>, Wong JJ<sup>5</sup>, Randhawa K<sup>2</sup>, Southerst D<sup>5</sup>, Mior S<sup>6</sup>, Sutton D<sup>2</sup>, Jacobs C<sup>7</sup>, Taylor-Vaisey A<sup>8</sup>.

Author information

Abstract

**BACKGROUND CONTEXT:**

Whiplash-associated disorders (WAD) and neck pain and associated disorders (NAD) are prevalent conditions that impact society and impose a significant economic burden on health care systems. Health economic evidence on WAD and NAD interventions has been sparse: only three economic evaluations of interventions for NAD were identified by the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders (NPTF). An updated overview is needed to inform health care policy and guidelines.

**PURPOSE:** *To determine the cost-effectiveness of interventions for grade I-III WAD and NAD in children and adults.*

**STUDY DESIGN:** *Systematic review of health economics literature, best-evidence synthesis.*

**METHODS:**

We systematically searched CINAHL, the Cochrane economic databases (Health Technology Assessment, NHS Economic Evaluation Database), EconLit, EMBASE, MEDLINE, PsycINFO, and Tufts CEA Registry from 2000 to 2015 for economic evaluations of WAD and NAD interventions. We appraised relevant evaluations using the Scottish Intercollegiate Guidelines Network Methodology Criteria for Economic Evaluations. We extracted data, including mean costs [standardized to 2013 Canadian dollars (CAD)] and quality-adjusted life years (QALYs), from studies with adequate methodological quality. We recalculated cost-effectiveness statistics based on the standardized currency using a willingness-to-pay of CAD \$50,000 per additional QALY. Funding was provided by the Ministry of Finance.

**RESULTS:**

Our search identified 1,616 citations. Six studies fulfilled our selection criteria, including three studies previously reviewed by the NPTF. Structured education appears cost-effective for adults with WAD. For adults with NAD, acupuncture added to routine medical care; manual therapy; multimodal care that includes manual therapy; advice and exercise; and psychological care using cognitive-behavioral therapy appear cost-effective. In contrast, adding manual therapy or diathermy to advice and exercise; multimodal care by a physiotherapist or physician; and behavioral-graded activity do not appear cost-effective for adults with NAD.

**CONCLUSIONS:**

Our review adds to the findings of the NPTF. Recent evidence suggests that structured education is cost-effective for WAD, while advice and exercise and multimodal care that includes manual therapy are cost-effective for NAD. Obtaining more robust health economic evidence for non-invasive interventions for WAD and NAD in children and adults remains an essential research priority.

**KEYWORDS:** *Cost-effectiveness; economic evaluation; intervention; neck pain; systematic review; whiplash*

**19. GLENOHUMERAL/SHOULDER****Shoulder measurements in pain****Biomechanical measures in participants with shoulder pain: Intra-rater reliability**

Lori A. Michener Kevin A. Elmore Benjamin J. Darter Mark K. Timmons

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.011>

## Highlights

- Measures of shoulder kinematics and sEMG can be consistently collected for most variables.
- Measures of scapular internal/external rotation had lower reliability at lower arm angles.
- Measures of LT, UT, SA muscle activity had the lowest reliability and highest error values.
- Measures of LT, UT, SA had lower reliability at the lower arm intervals of motion.
- Measures from the total phase of motion had higher reliability and lower error values.

## Abstract

Biomechanical measures are used to characterize the mechanisms of treatment for shoulder pain. The objective was to characterize test-retest reliability and measurement error of shoulder surface electromyographic(sEMG) and kinematic measures. Individuals( $n = 12$ ) with subacromial pain syndrome were tested at 2 visits. Five repetitions of shoulder scapular plane elevation were performed while collecting sEMG of the upper trapezius(UT), middle trapezius(MT), lower trapezius(LT), serratus anterior(SA) middle-deltoid, and infraspinatus muscles during ascending and descending phases. Simultaneously, electromagnetic sensors measured 3-dimensional kinematics of scapular internal/external rotation, upward/downward rotation, posterior/anterior tilt, and clavicular elevation/depression and clavicular protraction/retraction. Kinematic and sEMG variables were reduced for the total phase of ascending and descending elevation ( $30^{\circ}$ – $120^{\circ}$ ,  $120^{\circ}$ – $30^{\circ}$ ), at  $30^{\circ}$  intervals for sEMG, and at every  $30^{\circ}$  discrete kinematic angle. The intraclass correlation coefficients(ICC) ranged from 0.08 to 0.99 for sEMG and 0.23–0.95 for kinematics. Correspondingly, the standard error of the measurement(SEM) and minimal detectable change(MDC) for sEMG measures varied from 2.3% to 103.8% of a reference contraction(REF-contraction).

For kinematics, the SEM and MDC varied from  $1.4^{\circ}$  to  $5.9^{\circ}$ . Between-day reliability was good to very good, except for scapular internal/external rotation kinematics, and sEMG for the LT, UT, and SA. sEMG error values were highest ( $>25\%$ REF-contraction) for most of the LT, UT, and SA variables. Kinematic error values indicate changes or differences of  $2^{\circ}$ – $3^{\circ}$  are meaningful, except for upward/downward rotation and internal/external rotation with MDCs of  $4^{\circ}$ – $6^{\circ}$ . Generally, data from the total phase of movement had better reliability and lower error than the data from sEMG interval or kinematic discrete angles.

Keywords: Scapula, Rotator cuff, Impingement syndrome, Kinematics, Electromyography

### Shoulder problems and use

Best Pract Res Clin Rheumatol. 2015 Jun;29(3):405-23. doi: 10.1016/j.berh.2015.04.001. Epub 2015 May 8.

#### **Shoulder disorders and occupation.**

Linaker CH<sup>1</sup>, Walker-Bone K<sup>2</sup>.

Author information

Abstract

Shoulder pain is very common, and it causes substantial morbidity. Standardised classification systems based upon presumed patho-anatomical origins have proved poorly reproducible and hampered epidemiological research. Despite this, there is evidence that exposure to combinations of physical workplace strains such as overhead working, heavy lifting and forceful work as well as working in an awkward posture increases the risk of shoulder disorders. Psychosocial risk factors are also associated.

There is currently little evidence to suggest that either primary prevention or treatment strategies in the workplace are very effective, and more research is required, particularly around the cost-effectiveness of different strategies.

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**KEYWORDS:** Frozen shoulder (adhesive capsulitis); Impingement syndrome; Rotator cuff; Shoulder pain

PMID: 26612238

**20 A. ROTATOR CUFF****Acromial spurs**

J Shoulder Elbow Surg. 2015 Dec 1. pii: S1058-2746(15)00526-1. doi: 10.1016/j.jse.2015.09.016.

**Does scapular morphology affect the integrity of the rotator cuff?**

Pandey V<sup>1</sup>, Vijayan D<sup>2</sup>, Tapashetti S<sup>2</sup>, Agarwal L<sup>2</sup>, Kamath A<sup>3</sup>, Acharya K<sup>2</sup>, Maddukuri S<sup>4</sup>, Willems WJ<sup>5</sup>.

Author information

Abstract

**BACKGROUND:**

Current evidence suggests that distinct scapular morphologies may predispose patients to a rotator cuff tear. The objective of this longitudinal study was to evaluate the relationship between symptomatic degenerative cuff tears and different radiographic acromial characteristics, including acromion shape, indices (acromial index [AI], critical shoulder angle [CSA]), and acromial spur.

**METHODS:**

We divided 166 patients into 3 groups matched for age and sex: group 1, degenerative full-thickness tear; group 2, partial thickness bursal tear; and group 3, normal cuff. Patients were evaluated with standard radiographs and ultrasonography.

**RESULTS:**

The presence of an acromial spur was strongly associated with a full-thickness cuff tear (odds ratio, 3.5;  $P = .001$ ). AI and CSA revealed a statistically significant difference between means of group 1 ( $P = .006$ ) and group 3 ( $P < .001$ ). There was no statistically significant difference in means of AI between groups 1 and 2 ( $P = .695$ ) and between groups 2 and 3, with respect to AI ( $P = .071$ ) and CSA ( $P = .125$ ). Receiver operating characteristic curve revealed a higher area for CSA (0.70) than for AI (0.61). Stepwise logistic regression rejected AI as a cuff tear predictor but confirmed CSA and a spur to be stronger predictors of a full-thickness cuff tear. There was no association between the Bigliani acromial type and rotator cuff tear ( $P = .06$ ).

**CONCLUSIONS:**

The presence of an acromion spur is strongly associated with full-thickness cuff tear. Higher AI and CSA are associated with a full-thickness tear but not with partial tears. The type of acromion is not related to cuff tear.

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**KEYWORDS:**

Scapular morphology; acromion; acromion index; acromion shape; acromion spur; critical shoulder angle; degenerative tear; rotator cuff

PMID: 26652696

**24. ELBOW****Lateral epicondylitis and muscle activity**

Scand J Med Sci Sports. 2015 Dec 1. doi: 10.1111/sms.12584.

**Forearm muscle activity is modified bilaterally in unilateral lateral epicondylalgia: A case-control study.**

Heales LJ<sup>1</sup>, Vicenzino B<sup>1</sup>, MacDonald DA<sup>1</sup>, Hodges PW<sup>1</sup>.

Author information

**Abstract**

Lateral epicondylalgia (LE) is associated with a reduced wrist extensor muscle activity and altered biomechanics. This study compared the coordination between forearm muscles during gripping in individuals with LE and pain-free controls. Intramuscular electrodes recorded myoelectric activity from extensor carpi radialis brevis/longus (ECRB/ECRL), extensor digitorum communis (EDC), flexor digitorum superficialis/profundus (FDS/FDP), and flexor carpi radialis (FCR), bilaterally, in 15 participants with unilateral LE and 15 pain-free controls. Participants performed a gripping task at 20% maximum force in four arm positions. The contribution of each muscle was expressed as a proportion of the summed electromyography of all muscles. In individuals with LE, ECRB contributed less to total electromyography in the symptomatic arm but not the asymptomatic arm than pain-free controls. The contribution of EDC and FDP to total electromyography was greater in both the symptomatic and asymptomatic arm of the LE group, than pain-free controls. No other differences were observed between groups. Subtle differences in muscle activation were present with differing arm positions.

These findings indicate forearm muscle activity is modified in LE. It is unknown whether this is cause or effect. Changes in the asymptomatic side may imply involvement of central mechanisms.

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**KEYWORDS:** *Tendinopathy; motor control; motor system; neuromuscular control; tennis elbow*

PMID: 26620314

## 26. CARPAL TUNNEL SYNDROME

### Test for

J Bone Joint Surg Am. 2015 Dec 2;97(23):1958-61. doi: 10.2106/JBJS.O.00476.

### **A Comparison of Three Diagnostic Tests for Carpal Tunnel Syndrome Using Latent Class Analysis.**

Fowler JR<sup>1</sup>, Cipolli W<sup>2</sup>, Hanson T<sup>3</sup>.

Author information

Abstract

#### **BACKGROUND:**

The current reference standard for carpal tunnel syndrome is under debate. Recent studies have demonstrated similar diagnostic accuracy between ultrasound and nerve conduction studies. The purpose of the present study was to determine the sensitivity and specificity of ultrasound, nerve conduction studies, and Carpal Tunnel Syndrome 6 (CTS-6) for the diagnosis of carpal tunnel syndrome using latent class analysis.

#### **METHODS:**

Latent class analysis is a statistical technique that can be used to estimate the accuracy of diagnosis when there is no universally accepted reference standard. This type of analysis is useful in the setting of carpal tunnel syndrome as there remains substantial controversy with respect to the necessity of nerve conduction studies and other confirmatory testing. CTS-6 is a validated clinical diagnostic tool for the diagnosis of carpal tunnel syndrome that has been shown to have a high sensitivity and specificity. Data from a database on the cases of eighty-five consecutive patients who had had nerve conduction studies, CTS-6, and ultrasound were analyzed using classical latent class analysis, assuming that the three tests were imperfect and conditionally independent.

#### **RESULTS:**

The sensitivities of ultrasound, CTS-6, and nerve conduction studies were 91% (95% confidence interval [CI], 81% to 98%), 95% (95% CI, 86% to 99%), and 91% (95% CI, 81% to 97%), respectively. The specificities of ultrasound, CTS-6, and nerve conduction studies were 94% (95% CI, 80% to 100%), 91% (95% CI, 74% to 99%), and 83% (95% CI, 66% to 95%), respectively.

#### **CONCLUSIONS:**

Ultrasound, nerve conduction studies, and CTS-6 have similar sensitivity and specificity for the diagnosis of carpal tunnel syndrome. The currently accepted reference standard (nerve conduction studies) had the lowest sensitivity and specificity of the three tests. These findings support previous studies that have suggested that CTS-6 and ultrasound are highly accurate in the diagnosis of carpal tunnel syndrome and that nerve conduction studies are not necessary in most cases.

#### **LEVEL OF EVIDENCE:**

Diagnostic Level III. See Instructions for Authors for a complete description of levels of evidence.

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PMID:26631997

### 28. REPLACEMENTS

#### Impact of spinal deformities

Orthop Clin North Am. 2016 Jan;47(1):19-28. doi: 10.1016/j.ocl.2015.08.005.

#### **The Impact of Lumbar Spine Disease and Deformity on Total Hip Arthroplasty Outcomes.**

Blizzard DJ<sup>1</sup>, Nickel BT<sup>2</sup>, Seyler TM<sup>2</sup>, Bolognesi MP<sup>2</sup>.

Author information

#### Abstract

Concurrent spine and hip disease is common. Spinal deformities can restrict lumbar range of motion and lumbar lordosis, leading to pelvic obliquity and increased pelvic tilt. A comprehensive preoperative workup and component templating ensure appropriate compensation for altered pelvic parameters for implantation of components according to functional positioning. Pelvic obliquity from scoliosis must be measured to calculate appropriate leg length.

Cup positioning should be templated on standing radiograph to limit impingement from cup malposition. In spinal deformity, the optimal position of the cup that accommodates pelvic parameters and limits impingement may lie outside the classic parameters of the safe zone.

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#### **KEYWORDS:**

Kyphosis; Lumbar; Pelvic tilt; Sagittal balance; Scoliosis; Spinal deformity; THA; Total hip arthroplasty

PMID: 26614917

**30 A. IMPINGEMENT**

**Analysis of impingements**

**Femoroacetabular impingement and osteoarthritis of the hip**

Canadian Family Physician, 12/16/2015 Zhang C, et al.

Abstract

**Objective** To outline the clinical presentation, physical examination findings, diagnostic criteria, and management options of femoroacetabular impingement (FAI).

**Sources of information** PubMed was searched for relevant articles regarding the pathogenesis, diagnosis, treatment, and prognosis of FAI.

**Main message** In recent years, FAI has been increasingly recognized as a potential precursor and an important contributor to hip pain in the adult population and idiopathic hip osteoarthritis later in life. Femoroacetabular impingement is a collection of bony morphologic abnormalities of the hip joint that result in abnormal contact during motion. *Cam-type FAI* relates to a non-spherical osseous prominence of the proximal femoral neck or head-neck junction. *Pincer-type FAI* relates to excessive acetabular coverage over the femoral head, which can occur owing to several morphologic variants. Patients with FAI present with chronic, deep, or aching anterior groin pain most commonly in the sitting position, or during or after activity. Patients might also experience occasional sharp pains during activity. A thorough history should be taken that includes incidence of trauma and exercise frequency. A physical examination should be performed that includes a full hip, low back, and abdominal examination to assess for alternate causes of anterior groin pain. Diagnosis of FAI should be confirmed with radiography. Femoroacetabular impingement can be managed conservatively with rest, modification of activities, medications, and physiotherapy, or it can be treated surgically.

**Conclusion** Femoroacetabular impingement is an important cause of anterior groin pain. Early recognition and intervention by the primary care provider might be critical to alleviating morbidity and preventing FAI progression.

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**31. KNEE****Laxity**

Knee Surg Sports Traumatol Arthrosc. 2015 Dec;23(12):3571-7. doi: 10.1007/s00167-014-3244-6. Epub 2014 Aug 26.

**Combined anterior and rotational laxity measurements allow characterizing personal knee laxity profiles in healthy individuals.**

Mouton C<sup>1</sup>, Seil R<sup>1,2</sup>, Meyer T<sup>3</sup>, Agostinis H<sup>1</sup>, Theisen D<sup>4</sup>.  
Author information

Abstract

**PURPOSE:**

The aim of this study was to quantify sagittal and rotational knee laxity profiles taking into account individual influencing factors.

**METHODS:**

Linear regression models were used to determine which individual characteristics (age, height, body mass and sex) influenced the outcome in a group of 104 healthy subjects. The standardized residuals were used as individualized (corrected) laxity scores and were combined to determine knee laxity profiles.

**RESULTS:**

Anterior knee laxity was not influenced by individual characteristics. Rotational knee laxity was higher in females and inversely related to body mass. The correlation between anterior laxity and internal rotation scores was weak ( $r = 0.24$ ,  $p = 0.02$ ). The proportion of knees concerned by increased laxity scores (scores  $>1$ ) was similar for anterior displacement, internal and external rotation (15 %). Only 32 % of the tested subjects showed a normal profile (score  $>-1$  and  $<1$ ) for all three directions, 33 % were concerned by hyperlaxity, 40 % by hypolaxity and 5 % by both.

**CONCLUSIONS:**

The diversity of laxity profiles found here highlights that the interpretation of multidirectional knee laxity is complex and suggests the necessity for individualized care of knee diseases and injuries. These results contribute to the understanding of knee laxity and throw the basis for prevention strategies and improvement of treatment outcomes in injuries and diseases.

**LEVEL OF EVIDENCE:**

Case series with no comparison groups, Level IV.

**KEYWORDS:**

Anterior knee laxity; Knee laxity profiles; Rotational knee laxity

PMID: 25155050

**32 A. KNEE/ACL****Demographics**

Am J Sports Med. 2015 Dec;43(12):2959-65. doi: 10.1177/0363546515603053. Epub 2015 Sep 21.

**Does Racial Variation Influence Preoperative Characteristics and Intraoperative Findings in Patients Undergoing Anterior Cruciate Ligament Reconstruction?**

Navarro RA<sup>1</sup>, Inacio MC<sup>2</sup>, Maletis GB<sup>3</sup>.

**Abstract**

**BACKGROUND:** A limited number of large multiethnic cohorts of patients undergoing anterior cruciate ligament reconstruction (ACLR) exist; therefore, little is known about racial differences in preoperative and intraoperative characteristics of patients undergoing this procedure.

**PURPOSE:** To evaluate preoperative patient, surgeon, and hospital characteristics and intraoperative findings associated with various patient races undergoing ACLR.

**STUDY DESIGN:** Cohort study; Level of evidence, 3.

**METHODS:** A cross-sectional study of patients undergoing primary ACLR (performed between January 1, 2008 and September 30, 2012) was conducted. The Kaiser Permanente ACLR Registry was used to identify the cases and variables for the study. The variables of age, sex, time from injury to surgery, body mass index, sport at the time of injury, concomitant injury (menisci, cartilage, other ligament), surgeon training, and surgeon and site volumes were evaluated. Race was categorized into white (reference), Hispanic, Asian, and black.

Polychotomous regression models were employed. Odds ratios (ORs) and 95% CIs are provided.

**RESULTS:** A total of 14,278 ACLRs were evaluated; there were 7401 (51.8%) ACLRs performed on white, 3912 (27.4%) on Hispanic, 1894 (13.3%) on Asian, and 1071 (7.5%) on black patients. Men predominated overall as well as in each of the race categories. Compared with white patients, after adjusting for all covariates, Asian (OR, 1.24; 95% CI, 1.10-1.40) and Hispanic (OR, 1.52; 95% CI, 1.39-1.67) patients undergoing ACLR were more likely to be male than female, and black patients were more likely to be female (OR, 0.69; 95% CI, 0.60-0.80). All racial groups tended to undergo ACLR in younger age bands compared with white patients, with black patients having the highest odds of being <17 years (OR, 2.74; 95% CI, 2.23-3.37) and 17 to 24 years of age (OR, 2.28; 95% CI, 1.94-2.68) compared with being ≥25 years. Asian patients were more likely injured playing basketball (OR, 4.31; 95% CI, 3.67-5.06), black patients during football (OR, 3.48; 95% CI, 2.73-4.45) and basketball (OR, 5.52; 95% CI, 4.49-6.78), and Hispanic patients during soccer (OR, 3.09; 95% CI, 2.75-3.48). Hispanic patients had a higher likelihood of having both menisci injured at the time of surgery (OR, 1.31; 95% CI, 1.16-1.49) as well as the lateral meniscus (OR, 1.31; 95% CI, 1.17-1.47). Asian patients had a lower likelihood of cartilage injuries (OR, 0.78; 95% CI, 0.68-0.88). Sports medicine fellowship-trained surgeons were more likely to have operated on black (OR, 1.27; 95% CI, 1.07-1.51) and Hispanic (OR, 1.16; 95% CI, 1.04-1.29) patients.

**CONCLUSION:** In this large representative sample of patients undergoing ACLR in the United States, 48.2% of the cohort was nonwhite, and racial variations in sex, age, sport at injury, and intraoperative findings at ACLR were identified. Understanding the differences in ACL injury presentation and concomitant injuries by race can be useful in helping tailor the development of an ACL injury prevention program, during the informed consent process, and in the arthroscopic portion of the procedure according to patient race-specific characteristics.

**KEYWORDS:** anterior cruciate ligament reconstruction; concomitant injury; race

PMID: 26391862

**Post-surgical instability**

Knee Surg Sports Traumatol Arthrosc. 2015 Dec;23(12):3691-7. doi: 10.1007/s00167-014-3279-8. Epub 2014 Sep 27.

**Static and dynamic tibial translation before, 5 weeks after, and 5 years after anterior cruciate ligament reconstruction.**

Tagesson S<sup>1</sup>, Öberg B<sup>2</sup>, Kvist J<sup>2</sup>.  
Author information

## Abstract

**PURPOSE:**

To evaluate static and dynamic tibial translation before, 5 weeks after, and 5 years after anterior cruciate ligament (ACL) reconstruction. To explore whether static and dynamic tibial translation are correlated.

**METHODS:**

Ten patients undergoing quadruple hamstring tendon graft ACL reconstruction were evaluated before, 5 weeks after, and 5 years after ACL reconstruction. Sagittal tibial translation was measured during the Lachman test (static translation) and during gait (dynamic translation) using a CA-4000 electrogoniometer.

**RESULTS:**

Five years after ACL reconstruction, static tibial translation did not differ between knees (Lachman test 90 N and 134 N n.s.). In contrast, there was greater maximal anterior tibial translation during gait in ACL-reconstructed knees than in uninjured knees ( $5.5 \pm 1.4$  vs.  $4.5 \pm 1.6$  mm,  $P = 0.028$ ). There were no differences in static or dynamic tibial translation between the 5-year follow-up and before ACL reconstruction or between the 5-year follow-up and the 5-week follow-up. There were no correlations between static and dynamic tibial translation.

**CONCLUSION:**

Although static tibial translation did not differ between knees 5 years after ACL reconstruction, dynamic tibial translation during gait was greater in ACL-reconstructed knees than in uninjured knees. Neither static nor dynamic tibial translation changed 5 years after ACL reconstruction as compared to before surgery and 5 weeks after surgery. Static tibial translation did not correlate with dynamic tibial translation.

**CLINICAL RELEVANCE:**

This study indicates that although the knee is stable during static measurements, kinematics during gait is impaired 5 years after ACL reconstruction. This may affect the return to sport and risk of osteoarthritis.

**LEVEL OF EVIDENCE:**

Case series, Level IV.

**KEYWORDS:**

ACL; Functional joint stability; Knee kinematics; Knee laxity; Reconstruction

PMID: 25261221

**Muscle activation after****Voluntary activation of quadriceps femoris in patients with unilateral anterior cruciate ligament rupture within 6 months of injury: a cross-sectional observational study**Amanda Trees<sup>1</sup> John Dixon Tracey E. HoweDOI: <http://dx.doi.org/10.1016/j.math.2015.11.007>**Highlights**

- Voluntary activation was lower in the injured limb than the uninjured limb.
- Peak torque was lower in the injured limb than the uninjured limb.
- Strength and muscle inhibition should be targeted in rehabilitation.

**Abstract****Background**

Deficits in quadriceps femoris strength and voluntary activation have been well documented in chronic anterior cruciate ligament (ACL) injuries, but less is known about the acute or early phase after injury.

**Objectives**

The aim of this study was to evaluate and compare the levels of quadriceps voluntary activation (VA) and strength in both limbs of participants with unilateral ACL ruptures (complete tears) within 6 months of injury.

**Design**

Cross-sectional observational study.

**Method**

Seventeen participants, 12 male, mean age 30 (17-45) years, performed maximal voluntary isometric contractions with the interpolated twitch technique.

**Results**

Mean (SD) peak VA was significantly lower in the injured limb 76.5 (15.0) % than the uninjured limb 85.9 (6.7) % ( $p=0.02$ ). Mean (SD) peak torque in the injured limb was significantly lower 162.7 (74.1) Nm than the uninjured limb 240.5 (81.0) Nm ( $p<0.01$ ).

**Conclusions**

This between-limb difference in VA has not previously been observed in patients within 6 months of ACL rupture. Our findings suggest that early rehabilitation programs for adults with ACL rupture should focus on reducing VA deficits to facilitate improvement of the quadriceps femoris muscle strength in the injured limb to comparable values of the uninjured limb.

**Keywords:** *voluntary muscle activation, quadriceps strength, anterior cruciate ligament*

**Male hormones and ACL injury**

Knee Surg Sports Traumatol Arthrosc. 2015 Dec;23(12):3578-84. doi: 10.1007/s00167-014-3247-3. Epub 2014 Aug 27.

**The influence of sex hormones on anterior cruciate ligament ruptures in males.**

Stijak L<sup>1</sup>, Kadija M<sup>2</sup>, Djulejić V<sup>3</sup>, Aksić M<sup>4</sup>, Petronijević N<sup>5</sup>, Aleksić D<sup>6</sup>, Radonjić V<sup>7</sup>, Bumbaširević M<sup>8</sup>, Filipović B<sup>9</sup>.

Author information

Abstract

**PURPOSE:**

The purpose of this study is to determine the difference in the concentrations of testosterone, 17- $\beta$  estradiol and progesterone between male patients with and without ACL rupture, as well as the possible effect of these hormones on generalized joint laxity.

**METHODS:**

Male subjects with non-contact knee joint injury were included in this study. Two groups were formed: the examined group, consisting of subjects with ACL rupture and the control group consisting of patients without ACL rupture. After this, the patients from these two groups were paired off on the basis of three factors, level of professional involvement in sports (including the type of sports activity), left or right side of the body and the age of the subjects. In the end, there were 29 pairs (58 subjects). The concentration of sex hormones was determined from saliva specimens with the aid of the Salimetrics enzyme immunoassay. The testing of generalized joint laxity was performed with the aid of the "laxity score" according to Beighton et al.

**RESULTS:**

Subjects with ACL rupture have highly statistically significantly greater concentrations of testosterone ( $p < 0.01$ ), statistically significantly greater concentrations of 17- $\beta$  estradiol ( $p < 0.05$ ), and a highly statistically significantly greater generalized joint laxity score than subjects with an intact ACL ( $p < 0.01$ ).

**CONCLUSION:**

Increased concentrations of testosterone or 17- $\beta$  estradiol may be a risk factor leading to ACL rupture. Also, generalized joint laxity may be a factor leading to ACL rupture, but none of the monitored hormones can be set down as the cause of its existence. Young male athletes with higher concentrations of testosterone and greater hyperelasticity should plan preventive programs of physiotherapy for ACL preservation since they present a vulnerable group susceptible to ACL rupture.

**LEVEL OF EVIDENCE:**

Diagnostic study, Level II.

**KEYWORDS:** 17- $\beta$  estradiol; Anterior cruciate ligament; Joint laxity; Progesterone; Testosterone PMID: 25160472

**35. KNEE/TOTAL****Muscle strength can predict need for Replacement in women**

Arthritis Rheumatol. 2015 Dec 14. doi: 10.1002/art.39540.

**Thigh muscle strength predicts knee replacement risk independent of radiographic disease and pain in women - data from the Osteoarthritis Initiative.**

Culvenor A<sup>1,2</sup>, Wirth W<sup>1,3</sup>, Ruhdorfer A<sup>1</sup>, Eckstein F<sup>1,3</sup>.

Author information

Abstract

**OBJECTIVE:**

To determine whether thigh muscle strength predicts knee replacement (KR) risk, independent of radiographic severity and pain.

**METHODS:**

Osteoarthritis Initiative participants with KR at 12-60 month (M) follow-up (cases) were each matched with one control (no KR throughout 60M) by age, sex, height, body mass index, baseline radiographic stage, and location of joint space narrowing. Isometric knee extensor and flexor strength were recorded biennially. The strength examination prior to KR ( $\leq 2$  years) was termed  $T_0$ , that two years prior to  $T_0$   $T_{-2}$ , and that four years prior  $T_{-4}$ . Muscle strength between cases and controls was compared using paired t-tests and conditional logistic regression adjusted for pain.

**RESULTS:**

136 of 4796 participants (60% women, age  $65 \pm 9$  years, BMI  $29 \pm 4$  kg/m<sup>2</sup>) received a KR during follow-up, had at least  $T_0$  strength data, and a matched control. Knee extensor strength at  $T_0$  (primary outcome) was significantly lower in female cases than controls ( $p < 0.001$ ; pain-adjusted odds ratio [ORp] 1.72, 95% confidence interval [CI] 1.16 to 2.56), but no difference was seen in men ( $p = 0.451$ ; ORp 0.80, 95%CI 0.50 to 1.27). Results were similar for knee flexor strength at  $T_0$ , and for longitudinal change in extensor and flexor strength between  $T_0$  and  $T_{-2}$ . Thigh muscle strength at  $T_{-2}$  or  $T_{-4}$ , or change between  $T_{-2}$  and  $T_{-4}$ , did not predict KR risk in men or women.

**CONCLUSION:**

Thigh muscle strength predicted KR risk in women, but not in men. These results may identify a window for modifying risk of KR surgery in women. This article is protected by copyright. All rights reserved.

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**KEYWORDS:**

joint replacement; knee; muscle strength; osteoarthritis

PMID: 26663882

**38 A. FOOT AND ANKLE****Calcaneal angle**

J Foot Ankle Surg. 2015 Nov 23. pii: S1067-2516(15)00415-9. doi: 10.1053/j.jfas.2015.09.002.

**Angle and Base of Gait Long Leg Axial and Intraoperative Simulated Weightbearing Long Leg Axial Imaging to Capture True Frontal Plane Tibia to Calcaneus Alignment in Valgus and Varus Deformities of the Rearfoot and Ankle.**

Boffeli TJ<sup>1</sup>, Waverly BJ<sup>2</sup>.

Author information

**Abstract**

The long leg axial view is primarily used to evaluate the frontal plane alignment of the calcaneus in relation to the long axis of the tibia when standing. This view allows both angular measurement and assessment for the apex of varus and valgus deformity of the rearfoot and ankle with clinical utility in the preoperative, intraoperative, and postoperative settings. The frontal plane alignment of the calcaneus to the long axis of the tibia is rarely fixed in the varus or valgus position because of the inherent flexibility of the foot and ankle, which makes patient positioning critical to obtain accurate and reproducible images. Inconsistent patient positioning and imaging techniques are commonly encountered with the long leg axial view for a variety of reasons, including the lack of a standardized or validated protocol. This angle and base of gait imaging protocol involves positioning the patient to align the tibia with the long axis of the foot, which is represented by the second metatarsal. Non-weightbearing long leg axial imaging is commonly performed intraoperatively, which requires a modified patient positioning technique to capture simulated weightbearing long leg axial images.

A case series is presented to demonstrate our angle and base of gait long leg axial and intraoperative simulated weightbearing long leg axial imaging protocols that can be applied throughout all phases of patient care for various foot and ankle conditions.

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**KEYWORDS:**

arthrodesis; frontal plane alignment; long leg axial; osteotomy; radiograph; rearfoot; trauma; valgus deformity; varus deformity

PMID: 26615525

## Lisfranc return to activity

Foot Ankle Int. 2015 Nov 23. pii: 1071100715617743.

**Return to Sports and Physical Activities After Primary Partial Arthrodesis for Lisfranc Injuries in Young Patients.**

MacMahon A<sup>1</sup>, Kim P<sup>1</sup>, Levine DS<sup>1</sup>, Burket J<sup>2</sup>, Roberts MM<sup>1</sup>, Drakos MC<sup>1</sup>, Deland JT<sup>1</sup>, Elliott AJ<sup>1</sup>, Ellis SJ<sup>3</sup>.

Author information

Abstract

**BACKGROUND:**

Research regarding outcomes in sports and physical activities after primary partial arthrodesis for Lisfranc injuries has been sparse. The purposes of this study were to assess various sports and physical activities in young patients following primary partial arthrodesis for Lisfranc injuries and to compare these with clinical outcomes.

**METHODS:**

Patients who underwent primary partial arthrodesis for a Lisfranc injury were identified by a retrospective registry review. Thirty-eight of 46 eligible patients (83%) responded for follow-up at a mean of 5.2 (range, 1.0 to 9.3) years with a mean age at surgery of 31.8 (range, 16.8 to 50.3) years. Physical activity participation was assessed with a new sports-specific, patient-administered questionnaire. Clinical outcomes were assessed with the Foot and Ankle Outcome Score (FAOS).

**RESULTS:**

Patients participated in 29 different and 155 total physical activities preoperatively, and 27 different and 145 total physical activities postoperatively. Preoperatively, 47.1% were high impact, and postoperatively, 44.8% were high impact. The most common activities were walking, bicycling, running, and weightlifting. Compared to preoperatively, difficulty was the same in 66% and increased in 34% of physical activities. Participation levels were improved in 11%, the same in 64%, and impaired in 25% of physical activities. Patients spent on average 4.2 (range, 0.0 to 19.8) hours per week exercising postoperatively. In regard to return to physical activity, 97% of respondents were satisfied with their operative outcome. Mean postoperative FAOS subscores were significantly worse for patients who had increased physical activity difficulty.

**CONCLUSION:**

Most patients were able to return to their previous physical activities following primary partial arthrodesis for a Lisfranc injury, many of which were high-impact. However, the decreased participation or increase in difficulty of some activities suggests that some patients experienced postoperative limitations in exercise. Future studies could compare sports outcomes between primary partial arthrodesis and open reduction internal fixation for Lisfranc injuries.

LEVEL OF EVIDENCE: Level IV, retrospective case series.

KEYWORDS: Lisfranc injury; arthrodesis; outcome studies; sports; trauma PMID: 6596795

**42. PLANTAR SURFACE****Stretching and plantar fasciitis****Effect of stretching with and without muscle strengthening exercises for the foot and hip in patients with plantar fasciitis: A randomized controlled single-blind clinical trial★**

Danilo H. Kamonseki Geiseane A. Gonçalves Liu C. Yi Império Lombardi Júnior

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.006>

## Highlights

- Daily stretching exercises are effective at improving pain and function.
- Stretching with strengthening did not achieve better results than stretching alone.
- The three treatment groups had high drop-out rate.
- Natural progression cannot be inferred because of the lack of non-treatment group.

## Abstract

## Objective

To compare the effect of stretching with and without muscle strengthening of the foot alone or foot and hip on pain and function in patients with plantar fasciitis.

## Design

Single blind randomized controlled trial.

## Method

Eighty-three patients with plantar fasciitis were allocated to one of three treatment options for an eight-week period: Foot Exercise Group (FEG – extrinsic and intrinsic foot muscles), Foot and Hip Exercise Group (FHEG – abductor and lateral rotator muscles) and Stretching Alone Exercise Group (SAEG). Main measures: A visual analog scale for pain, the Foot and Ankle Outcome Score and the Star Excursion Balance Test. All evaluations were performed before treatment and after the last treatment session.

## Results

Improvements were found in all groups regarding the visual analog scale, the pain, activities of daily living, sports and recreation, quality of life ( $p < 0.001$ ) and other symptoms ( $p < 0.01$ ) subscales of the Foot and Ankle Outcome Score as well as posterolateral movement, posteromedial movement and composite score ( $p < 0.001$ ) on the Star Excursion Balance Test. No time-group interactions were found for any of the variables ( $p > 0.05$ ).

**Conclusions**

All three exercise protocols analyzed led to improvements at eight-week follow-up in pain, function and dynamic lower limb stability in patients with plantar fasciitis.

## Keywords:

Plantar fasciitis, Muscle stretching exercises, Resistance training, Randomized controlled trial

**45 A. MANUAL THERAPY LUMBAR & GENERAL****Adverse events**

J Manipulative Physiol Ther. 2013 Jun 17. pii: S0161-4754(13)00068-7. doi: 10.1016/j.jmpt.2013.05.009.

**Serious Adverse Events and Spinal Manipulative Therapy of the Low Back Region: A Systematic Review of Cases.**

Hebert JJ<sup>1</sup>, Stomski NJ, French SD, Rubinstein SM.  
Author information

Abstract

**OBJECTIVE:**

The purpose of this study was to systematically search the literature for studies reporting serious adverse events following lumbopelvic spinal manipulative therapy (SMT) and to describe the case details.

**METHODS:**

A systematic search was conducted in PubMed including MEDLINE, EMBASE, CINAHL, and The Cochrane Library up to January 12, 2012, by an experienced reference librarian. Study selection was performed by 2 independent reviewers using predefined criteria. We included cases involving individuals 18 years or older who experienced a serious adverse event following SMT applied to the lumbar spine or pelvis by any type of provider (eg, chiropractic, medical, physical therapy, osteopathic, layperson). A serious adverse event was defined as an untoward occurrence that results in death or is life threatening, requires hospital admission, or results in significant or permanent disability. We included studies published in English, German, Dutch, and Swedish.

**RESULTS:**

A total of 2046 studies were screened, and 41 studies reporting on 77 cases were included. Important case details were frequently unreported, such as descriptions of SMT technique, the pre-SMT presentation of the patient, the specific details of the adverse event, time from SMT to the adverse event, factors contributing to the adverse event, and clinical outcome. Adverse events consisted of cauda equina syndrome (29 cases, 38% of total); lumbar disk herniation (23 cases, 30%); fracture (7 cases, 9%); hematoma or hemorrhagic cyst (6 cases, 8%); or other serious adverse events (12 cases, 16%) such as neurologic or vascular compromise, soft tissue trauma, muscle abscess formation, disrupted fracture healing, and esophageal rupture.

**CONCLUSIONS:**

This systematic review describes case details from published articles that describe serious adverse events that have been reported to occur following SMT of the lumbopelvic region. The anecdotal nature of these cases does not allow for causal inferences between SMT and the events identified in this review. Recommendations regarding future case reporting and research aimed at furthering the understanding of the safety profile of SMT are discussed.

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PMID: 23787298

**Pediatric manip**

J Manipulative Physiol Ther. 2013 Jul 8. pii: S0161-4754(13)00075-4. doi: 10.1016/j.jmpt.2013.05.015.

**A Proposed Model With Possible Implications for Safety and Technique Adaptations for Chiropractic Spinal Manipulative Therapy for Infants and Children.**

Marchand AM<sup>1</sup>.

Author information

Abstract

**OBJECTIVE:**

A literature review of tensile strength of adults and pediatric human spine specimens was performed to gather information about biomechanical forces and spinal differences of adults and children and to synthesize these findings into a scaling model to guide safety and clinical decisions for spinal manipulative therapy (SMT) for children and infants.

**METHODS:**

The literature search was performed using PubMed from inception to November 2012 with no filters or language restrictions. The search included terms related to pediatric spine biomechanics and tensile strength. Studies included those in which human tensile strengths necessary to create anatomical damage in the cervical, thoracic, or lumbar spine of pediatric human subjects were recorded. The pediatric population was defined as human subjects from birth to 18 years old. Biomechanical findings were used to propose a scaling model based on specimen age and differences in tensile strengths. A model of care was proposed using the scaling model and the existing literature on pediatric technique adaptations.

**RESULTS:**

Nine experimental studies were selected, 5 in the pediatric population (46 specimens) and 4 in the adult population (47 specimens). Mean tensile strengths were estimated, and ratios were used to describe differences between 4 age groups. The preliminary model of care proposed includes maximum loading forces by age group. From these studies, a model showed a nonlinear increase in the cervical spine tensile strengths based on specimen age.

**CONCLUSIONS:**

The literature showed that tensile strength differences have been observed between pediatric and adult specimens. A preliminary model of care including pediatric SMT technique adaptation based on patient age is proposed, which may possibly contribute to further knowledge of safety and clinical implications for SMT for children and infants.

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**KEYWORDS:**

Children; Chiropractic; Manipulation; Spinal; Therapeutics

PMID: 23845198

## TA and MFR improvement

**Increased sliding of transverse abdominis during contraction after myofascial release in patients with chronic low back pain**

Yen-Hua Chen Huei-Ming Chai Yio-Wha Shau Chung-Li Wang Shwu-Fen Wang

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.004>

## Highlights

- Increased change of thickness of TrA is noted after release in patients and control.
- Increased sliding is noted in the both ends of musculofascial junctions of the TrA.
- The musculofascial corset was shifted anteriorly in patients after release.

## Abstract

## Purpose

Recent evidence suggested the significance of integrity of the tension balance of the muscle-fascia corset system in spinal stability, particularly the posterior musculofascial junction which is adjacent to dorsal located paraspinal muscles joining each other at lateral raphe (LR). The purpose of this study was to compare the contraction of the transversus abdominis (TrA) at both anterior and posterior musculofascial muscle-fascia junctions in patients with low back pain (LBP) and asymptomatic participants before and immediately after a sustained manual pressure to LR.

## Methods

The present observational cohort study used a single-instance, test-retest design. The outcome variables included the resting thickness (Tr), the thickness during contraction (Tc), change in thickness ( $\Delta T$ ), sliding of musculofascial junction ( $\Delta X$ ), muscle length at rest (L) and displacement pattern ( $\Delta D$ ) of the TrA using ultrasonography. Vertical tolerable pressure at the LR was applied manual for 1 min. Tr, Tc,  $\Delta T$ , and  $\Delta X$  were analyzed by three-way ANOVA (musculofascial junction sites\*group\* pre-post manual release).  $\Delta L$  and  $\Delta D$  were analyzed by two-way ANOVA (group\* pre-post manual release).

## Results

Participants with LBP revealed less Tc,  $\Delta T$  and  $\Delta X$  at both sites ( $p < 0.005$ ). After myofascial release, LBP group demonstrated a positive  $\Delta D$  of the musculofascial junctions at both end ( $p < 0.001$ ). Nevertheless, both groups increased the  $\Delta T$  and  $\Delta X$  at both sites ( $p < 0.001$  and  $0.001$ , respectively).

**Conclusion**

The result indicated immediately effect of sustained manual pressure on musculofascial junction of TrA and supported the concept that the possible imbalanced tension of the myofascia corset of TrA in patients with LBP.

Keywords: Abdominal drawing-in maneuver, Transversus abdominis, Musculofascial junction, Tensegrity, Lateral raphe

**45 B. MANUAL THERAPY CERVICAL****Manipulation and dissection**

J Manipulative Physiol Ther. 2014 Jan 3. pii: S0161-4754(13)00273-X. doi: 10.1016/j.jmpt.2013.09.005.

**The Association Between Cervical Spine Manipulation and Carotid Artery Dissection: A Systematic Review of the Literature.**

Chung CL<sup>1</sup>, Côté P<sup>2</sup>, Stern P<sup>3</sup>, L'espérance G<sup>4</sup>.  
Author information

Abstract

**OBJECTIVE:**

Controversy surrounds the safety of cervical spine manipulation. Ischemic stroke secondary to cervical spine manipulation is a hypothesized adverse event. In Canada, the seriousness of these events and their perceived association to cervical spine manipulation has led some members of the public to call for a ban of the procedure. The primary objective of this study was to determine the incidence of internal carotid artery (ICA) dissection after cervical spine manipulation in patients who experience neck pain and its associated disorders. The secondary objective was to determine whether cervical spine manipulation is associated with an increased risk of ICA dissection in patients with neck pain, upper back pain, or headaches.

**METHODS:**

We systematically searched MEDLINE, CINAHL, Alternative Health, AMED, Index to Chiropractic Literature, and EMBASE from 1970 to November 2012. Two independent reviewers used standardized criteria to screen the eligibility of articles. We considered cohort studies, case-control studies, and randomized clinical trials that addressed our objectives. We planned to critically appraise eligible articles using the Scottish Intercollegiate Guideline Network methodology.

**RESULTS:**

We did not find any epidemiologic studies that measured the incidence of cervical spine manipulation and ICA dissection. Similarly, we did not find any studies that determined whether cervical spine manipulation is associated with ICA dissection.

**CONCLUSIONS:**

The incidence of ICA dissection after cervical spine manipulation is unknown. The relative risk of ICA dissection after cervical spine manipulation compared with other health care interventions for neck pain, back pain, or headache is also unknown. Although several case reports and case series raise the hypothesis of an association, we found no epidemiologic studies that validate this hypothesis.

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**KEYWORDS:**

Carotid Artery; Chiropractic; Injuries; Manipulation; Spinal

PMID: 24387889

**45 D. MANUAL THERAPY EXTREMITIES****Hip mobilization MWM****Immediate effects of hip mobilization with movement in patients with hip osteoarthritis: A randomised controlled trial★**

Carlos Beselga Francisco Neto Francisco Albuquerque-Sendín Toby Hall Natália Oliveira-Campelo

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.007>

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**Highlights**

- Immediate effects of hip MWM and placebo were evaluated in patients with hip OA.
- MWM decreased pain, improved ROM, and physical function greater than placebo.
- These results direct future studies to investigate long-term efficacy.

**Abstract****Background**

Mobilization with movement (MWM) has been shown to reduce pain, increase range of motion (ROM) and physical function in a range of different musculoskeletal disorders. Despite this evidence, there is a lack of studies evaluating the effects of MWM for hip osteoarthritis (OA).

**Objectives**

To determine the immediate effects of MWM on pain, ROM and functional performance in patients with hip OA.

**Design**

Randomized controlled trial with immediate follow-up.

**Method**

Forty consenting patients (mean age  $78 \pm 6$  years; 54% female) satisfied the eligibility criteria. All participants completed the study. Two forms of MWM techniques ( $n = 20$ ) or a simulated MWM (sham) ( $n = 20$ ) were applied. Primary outcomes: pain recorded by numerical rating scale (NRS). Secondary outcomes: hip flexion and internal rotation ROM, and physical performance (timed up and go, sit to stand, and 40 m self placed walk test) were assessed before and after the intervention.

**Results**

For the MWM group, pain decreased by 2 points on the NRS, hip flexion increased by  $12.2^\circ$ , internal rotation by  $4.4^\circ$ , and functional tests were also improved with clinically relevant effects following the MWM. There were no significant changes in the sham group for any outcome variable.

**Conclusions**

Pain, hip flexion ROM and physical performance immediately improved after the application of MWM in elderly patients suffering hip OA. The observed immediate changes were of clinical relevance. Future studies are required to determine the long-term effects of this intervention.

Keywords: Manual therapy, Osteoarthritis hip, Pain, Range of motion, Articular

**Glenohumeral distraction****The initial effects of a sustained glenohumeral postero-lateral glide during elevation on shoulder muscle activity: A repeated measures study on asymptomatic shoulders**

Daniel Cury Ribeiro Marcelo Peduzzi de Castro Gisela Sole Bill Vicenzino

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.014>

## Highlights

- Sustained glide reduced activity of monitored shoulder muscles.
- Changes in muscle activity were small.
- Functional significance of muscle activity change is to be determined.
- Sustained glide might alter joint mechanics and/or afferent sensory input.

## Abstract

## Background

Manual therapy enhances pain-free range of motion and reduces pain levels, but its effect on shoulder muscle activity is unclear. This study aimed to assess the effects of a sustained glenohumeral postero-lateral glide during elevation on shoulder muscle activity.

## Methods

Thirty asymptomatic individuals participated in a repeated measures study of the electromyographic activity of the supraspinatus, infraspinatus, posterior deltoid, and middle deltoid. Participants performed four sets of 10 repetitions of shoulder scaption and abduction with and without a glide of the glenohumeral joint. Repeated-measures multivariate analysis of variance (MANOVA) was used to assess the effects of movement direction (scaption and abduction), and condition (with and without glide) (within-subject factors) on activity level of each muscle (dependent variables). Significant MANOVAs were followed-up with repeated-measures one-way analysis of variance.

## Results

During shoulder scaption with glide, the supraspinatus showed a reduction of 4.1% maximal isometric voluntary contraction (MVIC) (95% CI 2.4, 5.8); and infraspinatus 1.3% MVIC (95% CI 0.5, 2.1). During shoulder abduction with a glide, supraspinatus presented a reduction of 2.5% MVIC (95% CI 1.1, 4.0), infraspinatus 2.1% MVIC (95% CI 1.0, 3.2), middle deltoid 2.2% MVIC (95% CI = 0.4, 4.1), posterior deltoid 2.1% MVIC (95% CI 1.3, 2.8).

**Conclusions**

In asymptomatic individuals, sustained glide reduced shoulder muscle activity compared to control conditions. This might be useful in enhancing shoulder movement in clinical populations. Reductions in muscle activity might result from altered joint mechanics, including simply helping to lift the arm, and/or through changing afferent sensory input about the shoulder.

## Keywords:

Shoulder, Manual therapies, Electromyography, Musculoskeletal

**46 A. UPPER LIMB NEUROMOBILIZATION****Neural stretching vs neural gliding**

J Manipulative Physiol Ther. 2015 Oct 16. pii: S0161-4754(15)00156-6. doi: 10.1016/j.jmpt.2015.09.002

**Comparison of Hypoalgesic Effects of Neural Stretching vs Neural Gliding: A Randomized Controlled Trial.**

Beltran-Alacreu H<sup>1</sup>, Jiménez-Sanz L<sup>2</sup>, Fernández Carnero J<sup>3</sup>, La Touche R<sup>4</sup>.  
Author information

Abstract

**OBJECTIVE:**

The purpose of this study was to evaluate the immediate mechanical hypoalgesic effect of neural mobilization in asymptomatic subjects. We also compared neural gliding vs neural stretching to see which produced greater hypoalgesic effects in asymptomatic subjects.

**METHODS:**

Forty-five asymptomatic subjects (20 men and 25 women; mean  $\pm$  SD age, 20.8  $\pm$  2.83 years) were randomly allocated into 3 groups: the neural glide group, the neural stretch group, and the placebo group. Each subject received 1 treatment session. Outcome measures included bilateral pressure pain threshold measured at the trigeminal, cervical, and tibialis anterior points, assessed pre-treatment and immediately post-treatment by a blinded assessor. Three-way repeated-measures analysis of variance was used to evaluate changes in pressure pain threshold, with group (experimental or control) as the between-subjects variable and time (pre-, post-treatment) or side (dominant, nondominant) as the within-subjects variable.

**RESULTS:**

Group differences were identified between neural mobilization groups and the placebo group. Changes occurred in all of the pressure pain threshold measures for neural gliding, and in all but the trigeminal point for neural stretch. No changes in the pressure pain threshold measures occurred in the placebo group.

**CONCLUSIONS:**

This research provides new experimental evidence that neural mobilization produces an immediate widespread hypoalgesic effect vs placebo but neural gliding produces hypoalgesic effects in more body sites than neural stretching.

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**KEYWORDS:** *Manual Therapy; Nociception; Pain*

PMID: 26481666

**48 A. STM****Massage and blood pressure**

J Cardiovasc Nurs. 2016 Jan-Feb;31(1):73-83. doi: 10.1097/JCN.0000000000000217.

**Effects of Massage on Blood Pressure in Patients With Hypertension and Prehypertension: A Meta-analysis of Randomized Controlled Trials.**

Liao IC<sup>1</sup>, Chen SL, Wang MY, Tsai PS.

Author information

Abstract

**BACKGROUND:**

Massage may help reduce blood pressure; previous studies on the effect of massage on blood pressure have presented conflicting findings. In addition, no systematic review is available.

**OBJECTIVE:**

The aim of this study was to evaluate the evidence concerning the effect of massage on blood pressure in patients with hypertension or prehypertension.

**METHODS:**

A search was performed on electronic database records up to October 31, 2013, based on the following medical subject headings or keywords: hypertension, massage, chiropractic, manipulation, and blood pressure. The methodological quality of randomized controlled trials was assessed based on the Cochrane collaboration tool. A meta-analysis was performed to evaluate the effect of massage on hypertension. The study selection, data extraction, and validation were performed independently by 2 reviewers.

**RESULTS:**

Nine randomized controlled trials met our inclusion criteria. The results of this study show that massage contributes to significantly enhanced reduction in both systolic blood pressure (SBP) (mean difference, -7.39 mm Hg) and diastolic blood pressure (DBP) (mean difference, -5.04 mm Hg) as compared with control treatments in patients with hypertension and prehypertension. The effect size (Hedges *g*) for SBP and DBP was -0.728 (95% confidence interval, -1.182 to -0.274; *P* = .002) and -0.334 (95% confidence interval, -0.560 to -0.107; *P* = .004), respectively.

**CONCLUSION:**

This systematic review found a medium effect of massage on SBP and a small effect on DBP in patients with hypertension or prehypertension. High-quality randomized controlled trials are urgently required to confirm these results, although the findings of this study can be used to guide future research.

PMID:25419947

### CTM vs massage for LBP

#### **A comparison of the effects of connective tissue massage and classical massage on low back pain-A randomized controlled trial**

Journal of Bodywork & Movement Therapies , 12/14/2015

Viklund P, et al.

**T**his trial indicates that connective tissue massage (CTM) may decrease pain in non-specific low back pain (NSLBP) patients, as efficiently as CM within a short time frame. CTM seems to affect dermomyofascial tissue differently than CM, although more research is needed to conclude the clinical relevance of these differences.

#### Methods

- Forty six patients with current non-specific low back pain lasting for at least one week were included in this randomized controlled trial.
- The interventions were connective tissue massage (CTM) along the iliac crest, and classical massage (CM) in the lower back for three and a half minutes.
- Pain, hip and lumbar range of motion, and changes in mechanical soft tissue properties (stiffness and elasticity) were measured at baseline, directly after and 10 minutes after treatment.
- Stiffness and elasticity was measured in both sides of the back, and on the sacrum with a MyotonPRO device.

#### Results

- The interventions gave a similar amount of clinically relevant pain reduction.
- There were no differences between groups regarding changes in ROM.
- There was a difference between groups in stiffness, generally increasing with the CTM, while decreasing with CM.
- Elasticity decreased in the left side of the back with CTM, while increasing on the right side with CM.
- Sacral elasticity first decreased, then increased with CTM

**51. CFS/BET****Prevention training not effective****Effect of education on non-specific neck and low back pain: A meta-analysis of randomized controlled trials**

Kanthheera Ainpradub Ekalak Sithipornvorakul Prawit Janwantanakul Allard J. van der Beek

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.012>

## Highlights

- Education is recommended as an important component of neck and low back pain care.
- This study reviewed the effectiveness of education for neck and low back pain care.
- Education was ineffective in preventing neck pain and treating neck and low back pain.
- Evidence is conflicting as to the effect of education on preventing low back pain.

## Abstract

## Background

Neck and low back pain are significant health problems due to their high prevalence among the general population. Educational intervention commonly aims to reduce the symptoms and risk for additional problems by increasing the participant's knowledge, which in turn will alter the person's behavior. The primary aim of this study was to review randomized controlled trials (RCTs) to gain insights into the effectiveness of education for the prevention and treatment of non-specific neck and low back pain.

## Methods

Publications were systematically searched from 1982 to March 2015 in several databases. Relevant RCTs were retrieved and assessed for methodological quality. Meta-analysis was conducted to examine the effectiveness of education for the prevention and treatment of non-specific neck and low back pain. The overall quality of evidence was assessed using the GRADE system.

## Results

Thirty-six RCTs (30 high-quality studies) were identified. A total of 15 RCTs, which compared education programs to no education program, were included for further analysis. All studies included investigated the effectiveness of education with intermediate- and long-term follow-ups. The results showed that education programs were not effective in preventing and treating neck pain as well as treating low back pain. Conflicting evidence was found for the effectiveness of education on prevention of low back pain.

**Conclusions**

Evidence suggests that education programs are not recommended in preventing or treating neck pain as well as treating low back pain, unless supplementary high-quality studies provide evidence to the contrary.

Keywords: Education, Spinal pain, Musculoskeletal disorders

### Back pain prevention

#### **Back pain: Prevention and management in the workplace**

Best Practice & Research Clinical Rheumatology, 12/15/2015

Schaafsma FG, et al.

Despite all the efforts in studying work-related risk factors for low back pain (LBP), interventions targeting these risk factors to prevent LBP have no proven cost-effectiveness. Even with adequate implementation strategies for these interventions on group level, these did not result in the reduction of incident LBP.

- Physical exercise, however, does have a primary preventive effect on LBP.
- For secondary prevention, it seems that there are more opportunities to cost-effectively intervene in reducing the risk of long-term sickness absence due to LBP.
- Starting at the earliest moment possible with proper assessment of risk factors for long-term sickness absence related to the individual, the underlying mechanisms of the LBP, and also factors related to the workplace by a well-trained clinician, may increase the potential of effective return to work (RTW) management.
- More research on how to overcome barriers in the uptake of these effective interventions in relation to policy-specific environments, and with regard to proper financing of RTW management is necessary.

**52. EXERCISE****School PE and injury**

Scand J Med Sci Sports. 2015 Dec 1. doi: 10.1111/sms.12618.

**Longitudinal influence of musculo-skeletal injuries and extra physical education on physical fitness in schoolchildren.**

Rexen CT<sup>1</sup>, Ersbøll AK<sup>2</sup>, Wedderkopp N<sup>1,3,4,5</sup>, Andersen LB<sup>1,6</sup>.

Author information

**Abstract**

The aims of this study were to investigate if (A) injuries and (B) increased physical education (PE) influenced the development of physical fitness in schoolchildren. Simultaneously, to investigate if a possible PE effect was modified by sport participation outside school hours. This was a longitudinal controlled school-based study. Six schools with 270 min of PE (extra PE) and four schools with 90 min of PE were followed up for 2.5 years. In total, 1054 children were included for analysis (normal PE = 443, extra PE = 611). Development in fitness was analyzed using composite z-scores from six fitness tests measured four times. Information of injury and sport was derived from weekly automated mobile phone text messages surveying the presence of musculo-skeletal pain and organized sport participation. Injury and extra PE both influenced the development of physical fitness. Injury decreased development of physical fitness with -1.01 composite z-score units (95% CI: -1.57; -0.45). Extra PE increased physical fitness development with 0.80 (95% CI: 0.49; 1.10) composite z-score units. The influence of injury was not dependent on extra PE.

No modifying effect was found by mean weekly sport participation outside school hours. In conclusion, extra PE had a positive effect, whereas injuries had a negative effect on physical fitness development in schoolchildren.

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**KEYWORDS:** *Epidemiology; elementary schools; multilevel modeling; primary schools*

PMID:26620453

**53. CORE****Fiber type in LBP**

J Manipulative Physiol Ther. 2015 Nov 4. pii: S0161-4754(15)00182-7. doi: 10.1016/j.jmpt.2015.10.004.

**Fiber Typing of the Erector Spinae and Multifidus Muscles in Healthy Controls and Back Pain Patients: A Systematic Literature Review.**

Cagnie B<sup>1</sup>, Dhooge F<sup>2</sup>, Schumacher C<sup>2</sup>, De Meulemeester K<sup>2</sup>, Petrovic M<sup>3</sup>, van Oosterwijk J<sup>4</sup>, Danneels L<sup>5</sup>.

Author information

Abstract

**OBJECTIVE:**

Understanding the changes in muscle fiber typing is relevant in the context of muscle disorders because it provides information on the metabolic profile and functional capacity. The aim of this study was to systematically review the literature comparing muscle fiber typing in the back muscles of healthy subjects with low back pain (LBP) patients.

**METHODS:**

Predefined keywords regarding muscle fiber typing and back muscles were combined in PubMed and Web of Science electronic search engines from inception to August 2014. Full-text articles were independently screened by 2 independent, blinded researchers. Full texts fulfilling the predefined inclusion criteria were assessed on risk of bias by 2 independent researchers, and relative data were extracted. Data were not pooled because of heterogeneity in biopsy locations and population.

**RESULTS:**

From the 214 articles that were identified, 18 met the inclusion criteria. These articles evaluated the muscle fiber type distribution or proportional fiber type area between muscles, muscle layers, men, and women or healthy subjects and LBP patients. Regarding muscle fiber type distribution, findings in healthy subjects and LBP patients show no or inconclusive evidence for intermuscular and interindividual differentiation. Studies evaluating the proportional fiber type area also suggest little intermuscular differentiation but provide plausible evidence that the proportional area occupied by type I fibers is higher in women compared to men. The evidence for differentiation based on the presence of low back pain is conflicting.

**CONCLUSION:**

This study found that the evidence regarding muscle fiber typing in back muscles is either inconclusive or shows little differences. The most plausible evidence exists for differentiation in proportional fiber type area depending on sex.

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**KEYWORDS:**

Low Back Pain; Muscle Fibers; Paraspinal Muscles; Skeletal

PMID: 26547762

**54. POSTURE****Strength and neck posture****Neck muscle endurance and head posture: A comparison between adolescents with and without neck pain**

Ana Carolina Oliveira Anabela G. Silva

DOI: <http://dx.doi.org/10.1016/j.math.2015.10.002>**Highlights**

- Neck pain in adolescents is of considerable duration and frequency.
- Neck pain in adolescents interferes with daily activities.
- Adolescents with neck pain have decreased neck flexor endurance capacity.
- Adolescents with neck pain have decreased neck extensor endurance capacity.
- There is a need for early interventions targeting adolescents with neck pain.

**Abstract****Objective**

The main aims of this study were to compare the neck flexor and extensor endurance and forward head posture between adolescents with and without neck pain. The secondary aims were to explore potential associations between muscles endurance, head posture and neck pain characteristics and to assess intra-rater reliability of the measurements used.

**Methods**

Adolescents with neck pain (n = 35) and age-matched asymptomatic adolescents (n = 35) had their forward head posture, neck flexor endurance and neck extensor endurance measured using clinical tests. Intra-rater reliability was also assessed.

**Results**

Forward head posture and neck flexor and extensor endurance tests showed moderate to almost perfect intra-rater reliability (ICC between 0.58 and 0.88). Adolescents with neck pain showed significantly less forward head posture (neck pain =  $46.62 \pm 4.92$ ; asymptomatic =  $44.18 \pm 3.64^\circ$ ,  $p > 0.05$ ) and less neck flexor (neck pain =  $24.50 \pm 23.03$ s; asymptomatic =  $35.89 \pm 21.53$ s,  $p > 0.05$ ) and extensor endurance (neck pain =  $12.66 \pm 77.94$ s; asymptomatic =  $168.66 \pm 74.77$ s,  $p > 0.05$ ) than asymptomatic adolescents.

**Conclusions**

Results suggest that changes in posture and neck muscle endurance are a feature of adolescents with neck pain.

Keywords: Neck pain, Endurance, Forward head posture, Adolescents

**56. ATHLETICS****Cardiac changes in athletes**

Circ Cardiovasc Imaging. 2015 Dec;8(12). pii: e003651.

**Exercise-Induced Left Ventricular Remodeling Among Competitive Athletes: A Phasic Phenomenon.**

Weiner RB<sup>1</sup>, DeLuca JR<sup>2</sup>, Wang F<sup>2</sup>, Lin J<sup>2</sup>, Wasfy MM<sup>2</sup>, Berkstresser B<sup>2</sup>, Stöhr E<sup>2</sup>, Shave R<sup>2</sup>, Lewis GD<sup>2</sup>, Hutter AM Jr<sup>2</sup>, Picard MH<sup>2</sup>, Baggish AL<sup>2</sup>.

Author information

Abstract

**BACKGROUND:**

Contemporary understanding of exercise-induced cardiac remodeling is based on cross-sectional data and relatively short duration longitudinal studies. Temporal progression of exercise-induced cardiac remodeling remains incompletely understood.

**METHODS AND RESULTS:**

A longitudinal repeated-measures study design using 2-dimensional and speckle-tracking echocardiography was used to examine acute augmentation phase (AAP; 90 days) and more extended chronic maintenance phase (39 months) left ventricular (LV) structural and functional adaptations to endurance exercise training among competitive male rowers (n=12; age 18.6±0.5 years). LV mass was within normal limits at baseline (93±9 g/m<sup>2</sup>), increased after AAP (105±7 g/m<sup>2</sup>; P=0.001), and further increased after chronic maintenance phase (113±10 g/m<sup>2</sup>; P<0.001 for comparison to post-AAP). AAP LV hypertrophy was driven by LV dilation ( $\Delta$ LV end-diastolic volume, 9±3 mL/m<sup>2</sup>; P=0.004) with stable LV wall thickness ( $\Delta$ LV wall thickness, 0.3±0.1 mm; P=0.63). In contrast, chronic maintenance phase LV hypertrophy was attributable to LV wall thickening ( $\Delta$  LV wall thickness, 1.1±0.4 mm; P=0.004) with stable LV chamber volumes ( $\Delta$ LV end-diastolic volume, 1±1 mL/m<sup>2</sup>; P=0.48). Early diastolic peak tissue velocity increased during AAP (-11.7±1.9 versus -13.6±1.3 cm/s; P<0.001) and remained similarly increased after chronic maintenance phase.

**CONCLUSIONS:**

In a small sample of competitive endurance athletes, exercise-induced cardiac remodeling follows a phasic response with increases in LV chamber size, early diastolic function, and systolic twist in an acute augmentation phase of exercise training. This is followed by a chronic phase of adaptation characterized by increasing wall thickness and regression in LV twist. Training duration is a determinant of exercise-induced cardiac remodeling and has implications for the assessment of myocardial structure and function in athletes.

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**KEYWORDS:**

echocardiography; exercise; hypertrophy, left ventricular; longitudinal studies; myocardium

PMID: 26666381

**Athletics keeps arteries flexible**

Clin Physiol Funct Imaging. 2015 Nov 27. doi: 10.1111/cpf.12326.

**The relationship between arterial stiffness and the lifestyle habits of female athletes after retiring from competitive sports: a prospective study.**

Koshihara H<sup>1</sup>, Maeshima E<sup>1</sup>, Okumura Y<sup>1</sup>.

Author information

**Abstract**

This study investigated the relationship between changes in arterial stiffness and the lifestyle habits of endurance athletes after retiring from competition. The subjects were 10 female university endurance athletes. We used formPWV/ABI<sup>®</sup> as an index for arterial stiffness and measured brachial-ankle pulse-wave velocity (baPWV) directly before subjects retired (0Y) and at 2 years after retirement (2Y). Furthermore, to investigate the relationship between arterial stiffness and lifestyle habits 2 years later, Lifecorder<sup>®</sup> PLUS was used to measure physical activity levels, hours of sleep were surveyed using a questionnaire, and a food intake survey was conducted using Excel Eiyokun Food Frequency Questionnaire Based on Food Group, FFQg Ver. 3.5. We found that baPWV increased significantly from 0Y to 2Y ( $P < 0.05$ ). Furthermore, negative correlations were observed between 2Y baPWV and step count as the physical activity index ( $r = -0.653$ ,  $P < 0.05$ ) and moderate physical activity ( $r = -0.663$ ,  $P < 0.05$ ). With regard to lifestyle habits that affected the amount of increase in baPWV from 0Y to 2Y ( $\Delta$ baPWV), negative correlations were noted between the step count ( $r = -0.690$ ,  $P < 0.05$ ) and total physical activity ( $r = -0.657$ ,  $P < 0.05$ ). However, no significant correlations were observed between 2Y baPWV and  $\Delta$ baPWV with food intake or hours of sleep. T

The results of this study suggested that physical activity was a lifestyle habit that inhibited an increase in arterial stiffness after retirement from competition and that having a high step count or engaging in physical activity for long periods of time in particular was useful in this regard.

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**KEYWORDS:**

detraining; lifecorder; physical activity; pulse wave velocity; step count

PMID: 26611545

## 58. RUNNING

### Over pronation may not be a problem

*Br J Sports Med* doi:10.1136/bjsports-2013-092202

- Original article

#### **Foot pronation is not associated with increased injury risk in novice runners wearing a neutral shoe: a 1-year prospective cohort study**

**Objective** To investigate if running distance to first running-related injury varies between foot postures in novice runners wearing neutral shoes.

**Design** A 1-year epidemiological observational prospective cohort study.

**Setting** Denmark.

**Participants** A total of 927 novice runners equivalent to 1854 feet were included. At baseline, foot posture on each foot was evaluated using the foot-posture index and categorised into highly supinated (n=53), supinated (n=369), neutral (n=1292), pronated (n=122) or highly pronated (n=18). Participants then had to start running in a neutral running shoe and to use global positioning system watch to quantify the running distance in every training session.

**Main outcome measure** A running-related injury was defined as any musculoskeletal complaint of the lower extremity or back caused by running, which restricted the amount of running for at least 1 week.

**Results** During 1 year of follow-up, the 1854 feet included in the analyses ran a total of 326 803 km until injury or censoring. A total of 252 participants sustained a running-related injury. Of these, 63 were bilateral injuries. Compared with a neutral foot posture, no significant body mass index-adjusted cumulative risk differences (RD) were found after 250 km of running for highly supinated feet (RD=11.0% (-10% to 32.1%), p=0.30), supinated feet (RD=-1.4% (-8.4% to 5.5%), p=0.69), pronated feet (RD=-8.1% (-17.6% to 1.3%), p=0.09) and highly pronated feet (RD=9.8% (-19.3% to 38.8%), p=0.51). In addition, the incidence-rate difference/1000 km of running, revealed that pronators had a significantly lower number of injuries/1000 km of running of -0.37 (-0.03 to -0.70), p=0.03 than neutrals.

**Conclusions** The results of the present study contradict the widespread belief that moderate foot pronation is associated with an increased risk of injury among novice runners taking up running in a neutral running shoe. More work is needed to ascertain if highly pronated feet face a higher risk of injury than neutral feet.

### 59. PAIN

#### Chronic pain and diet

#### **Research shows typical American diet can worsen chronic pain**

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UAB Medicine, 12/17/2015

Sufferers of chronic pain are more susceptible to prolonged and pronounced health issues when practicing poor diet habits, according to new research published by University of Alabama at Birmingham researcher Robert Sorge, Ph.D., and team in the *Journal of Pain*. Sorge's study highlights the negative effects of poor diet quality with respect to recovery from hypersensitivity and susceptibility to chronic pain. The implications of the research could be significant. "It is currently unknown whether increased pain is due to greater weight or poor diet quality, or both," said Sorge, an assistant professor in the Department of Psychology in UAB's College of Arts and Sciences. "This study shows us the direct link between poor diet quality and increased pain."

**Neuropathic pain anterior cingulate cortex**

Anesthesiology. 2015 Nov 13.

**Attenuation of Neuropathic Pain by Inhibiting Electrical Synapses in the Anterior Cingulate Cortex.**

Chen ZY<sup>1</sup>, Shen FY, Jiang L, Zhao X, Shen XL, Zhong W, Liu S, Wang ZR, Wang YW.  
Author information

Abstract

**BACKGROUND:**

Synaptic mechanisms and neuronal oscillations have been proposed to be responsible for neuropathic pain formation. Many studies have also highlighted the important role of electrical synapses in synaptic plasticity and in neuronal oscillations. Thus, electrical synapses may contribute to neuropathic pain generation. However, previous studies have primarily focused on the role of chemical synapses, while ignoring the role of electrical synapses, in neuropathic pain generation.

**METHODS:**

The authors adopted microinjection, RNA interference techniques, and behavioral tests to verify the link between connexin 36 (Cx36) and neuropathic pain. They also studied the selective Cx36 blocker mefloquine in rat chronic constriction injury and spared nerve injury model of neuropathic pain. Electrophysiologic recordings were used to further confirm the behavioral data.

**RESULTS:**

The authors found that Cx36, which constitutes the neuron-neuron electrical synapses, was up-regulated in the anterior cingulate cortex after nerve injury (n = 5). Meanwhile, Cx36-mediated neuronal oscillations in the gamma frequency range (30 to 80 Hz) (n = 7 to 8) and the neuronal synaptic transmission (n = 13 to 19) were also enhanced. Neuropathic pain was relieved by disrupting Cx36 function or expression in the anterior cingulate cortex. They also found that mefloquine, which are clinically used for treating malaria, affected gamma oscillations and synaptic plasticity, leading to a sustained pain relief in chronic constriction injury and spared nerve injury models (n = 7 to 12).

**CONCLUSION:**

The electrical synapses blocker mefloquine could affect gamma oscillations and synaptic plasticity in the anterior cingulate cortex and relieve neuropathic pain. Cx36 may be a new therapeutic target for treating chronic pain.

PMID:26566282

## 62 A. NUTRITION/VITAMINS

### Pomegranate extract decreases inflammation

#### **Effects of pomegranate extract supplementation on inflammation in overweight and obese individuals: A randomized controlled clinical trial**

Complementary Therapies in Clinical Practice ,

12/14/2015

Hosseini B, et al. –

The study was designed to determine the effect of thirty days of pomegranate extract oral supplementation on plasma inflammatory and oxidative stress biomarkers as well as serum metabolic profiles, in overweight and obese individuals. The study suggests that pomegranate extract consumption may reduce complications linked with obesity.

#### Methods

- In this randomized, double-blind, placebo-controlled study 48 obese and overweight participants were randomly assigned to receive either 1000mg of pomegranate extract, or a placebo, daily for 30 days.
- At baseline, and after 30 days of treatment, anthropometric parameters, dietary intake, plasma concentrations of malondialdehyde, interleukin-6 and hyper sensitive-C reactive protein and levels of serum lipids, glucose and insulin were assessed.

**High fiber and vegetable protein lower bone density****Diets high in fiber and vegetable protein are associated with low lumbar bone mineral density in young athletes with oligoamenorrhea**

Journal of the Academy of Nutrition and Dietetics, 12/14/2015

Barron E, et al.

In this study, authors want to determine dietary intake of specific food components in athletes with oligoamenorrhea (OA) compared to athletes with eumenorrhea (EA) and nonathletes (NA), and associations of the dietary intake of these nutrients with lumbar spine BMD. Compared with EA and NA, OA had a higher dietary intake of fiber, vegetable protein, and phytic acid, which were inversely associated with lumbar spine BMD z scores. Further studies are needed to assess dietary recommendations for OA to optimize bone accrual.

**Methods**

- This cross-sectional study evaluated 68 OA, 24 EA, and 26 NA individuals aged 14 to 23 years.
- Measurements included 4-day food records, a dual x-ray absorptiometry scan evaluating lumbar spine BMD and body composition, and hormone levels.
- Multivariate analysis was used to estimate associations of nutrients with lumbar spine BMD.

**Results**

- Compared with EA and NA, OA had higher intake of fiber, phytic acid, and vegetable protein (all P values <0.0001).
- Intake of isoflavones, genistein, and daidzein was higher in OA than NA (P=0.003 and P=0.0002, respectively).
- OA had lower consumption of energy from saturated fatty acids than NA (P=0.002).
- After controlling for confounders such as body weight, menstrual status (indicative of estrogen status), calcium intake, and serum vitamin D (known BMD determinants), lumbar spine BMD z scores were inversely associated with dietary fiber ( $\beta=-.30$ ; P=0.01), vegetable protein ( $\beta=-.28$ ; P=0.02), phytic acid ( $\beta=-.27$ ; P=0.02), genistein ( $\beta=-.25$ ; P=0.01), and daidzein ( $\beta=-.24$ ; P=0.01), and positively associated with percent energy from fatty acids ( $\beta=.32$ ; P=0.0006).

### 63. PHARMACOLOGY

#### NAAID and GI injury

J Clin Gastroenterol. 2016 Jan;50(1):5-10. doi: 10.1097/MCG.0000000000000432.

#### **NSAID-induced Gastrointestinal Injury: A Focused Update for Clinicians.**

Scheiman JM<sup>1</sup>.

Author information

#### Abstract

Gastroenterologists care for users of nonsteroidal anti-inflammatory drugs (NSAIDs) when the vast population exposed to the medication class experiences a relatively uncommon serious gastrointestinal (GI) side effect. As serious adverse cardiovascular (CV) effects of these drugs have also been recognized, there remains continued confusion about the best treatment for patients who benefit from NSAID therapy and are at risk for GI and CV adverse events. Recognition of those patients at risk and strategies to reduce the adverse side effects of NSAIDs continues to provide an opportunity to improve patient outcomes.

This review discusses the injury induced by these agents throughout the GI tract as well as strategies to prevent acute injury and reduce the development of serious adverse events. NSAID medication selection as well as GI cotherapy should balance individual patients' GI and CV risks.

PMID: 6524151