

## APRIL 2013 FMT ABSTRACTS

### MULTIFIDUS/LBP/Fatty

[Skeletal Radiol.](#) 2012 Dec 20. [Epub ahead of print]

**Fatty degeneration of multifidus muscle in patients with chronic low back pain and in asymptomatic volunteers: quantification with chemical shift magnetic resonance imaging.**

[Yanik B](#), [Keyik B](#), [Conkbayir I](#).

#### Source

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#### Abstract

##### **OBJECTIVE:**

To evaluate and compare the fatty degeneration of multifidus muscles by chemical shift magnetic resonance imaging (MRI) in patients with chronic low back pain and in asymptomatic volunteers.

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

Sixty-five patients with lumbar disc pathology were selected prospectively for this study. The control group consisted of 25 asymptomatic volunteers. The patients were grouped according to the fatty degeneration of multifidus muscles by a semiquantitative method (grade 0-4) on axial T2 weighted imaging. Chemical shift MRI was performed in the axial plane using a double-echo fast low-angle shot (FLASH) sequence. Fatty degeneration was calculated through signal intensity suppression rate (SISR) and signal intensity index (SII).

##### **RESULTS:**

The semiquantitative grading of fatty degeneration of the multifidus muscle was 0 in 25 of 65 patients (patient group 0), 1 in 20 patients (patient group 1), 2 in 20 patients (patient group 2). Neither grade 3 nor grade 4 were detected in patient groups. For the control group, patient group 0, patient group 1, and patient group 2, median SISR values were 5.00, -9.00, -17.50, and -22.50 %, respectively. SII median values were -4.20 % for the control group, 7.00 % for patient group 0, 12.50 % for patient group 1, and 19.50 % for patient group 2. SISR values in the multifidus muscle calculated for the patient groups were significantly lower than those calculated for the control group. SII values in patients groups were significantly higher than in the control group.

##### **CONCLUSIONS:**

Chemical shift MRI may be a useful method to quantitatively evaluate the fatty degeneration in multifidus muscle in patients with low back pain.

PMID:23263412

## Pain/Opiate use

[J Pain](#). 2013 Apr;14(4):424-30. doi: 10.1016/j.jpain.2012.12.016.

### **Does opiate use in traumatically injured individuals worsen pain and psychological outcomes?**

[Trevino CM](#), [Deroon-Cassini T](#), [Brasel K](#).

#### **Source**

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#### **Abstract**

Opiate use for chronic pain is becoming increasingly controversial. There has been a shift away from supporting the use of opiates for treatment of chronic pain. In addition to lack of effectiveness, concerns for adverse clinical outcomes, addiction, and death have provided the impetus for this change. The purpose of this study was to investigate the percent of trauma patients still using opiates, their pain levels, and psychological outcomes 4 months posttrauma. This was a study to evaluate chronic pain at 4 months posttrauma in 101 participants from a single level 1 trauma center. Eighty of the 101 participants developed chronic pain 4 months after their initial traumatic injury (79%). Of those who developed chronic pain, 27 (26%) were still using opiates. Those using narcotics at 4 months posttrauma had significantly more pain, life interference, depression, and anxiety. Posttraumatic stress disorder (PTSD) was not significantly influenced by narcotic use in this analysis. However, the mean associated with those using narcotics was higher and diagnostic for PTSD. Those taking opiates did not have significantly better relief from their pain using treatments or medications than those not using opiates ( $F = 8$ ,  $P = .08$ ). These findings bring into question the appropriate use of opiates for chronic pain and the possible exacerbating effects on pain and psychopathology in traumatically injured patients.

**PERSPECTIVE:** This article identifies data that provide evidence that narcotic pain medication needs to be used carefully in traumatically injured patients with chronic pain, especially in those individuals with comorbid psychological pathology.

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PMID:23548492

## LBP/Return to work

[BMC Musculoskelet Disord.](#) 2013 Apr 19;14(1):140. [Epub ahead of print]

### **Prediction model for unsuccessful return to work after hospital-based intervention in low back pain patients.**

[Jensen OK](#), [Stengaard-Pedersen K](#), [Jensen C](#), [Nielsen CV](#).

#### **Abstract**

#### **BACKGROUND:**

Many studies on low back pain (LBP) have identified prognostic factors, but prediction models for use in secondary health care are not available. The purpose of this cohort study, based on a randomised clinical study, was to identify risk factors for unsuccessful return to work (U-RTW) in sick-listed LBP patients with or without radiculopathy and to validate a prediction model for U-RTW.

#### **METHODS:**

325 sick-listed LBP patients with or without radiculopathy were included in an intervention study and followed for one year. Afterwards, 117 other LBP patients were recruited similarly, included in a validation study and also followed for one year. All patients were subjected to identical procedures and interventions and received a brief intervention by the same rehabilitation doctor and physiotherapist. Half of them received case manager guidance within a multidisciplinary setting. At baseline, they completed a questionnaire and went through a clinical low-back examination. Sciatica was investigated by magnetic resonance imaging (MRI). U-RTW was registered in a national database both initially and at 1-year.

#### **RESULTS:**

Neither initial U-RTW (24.0%) nor one-year U-RTW (38.2%) were statistically significantly different in the two intervention groups nor in patients with and without radiculopathy. Multivariate logistic regression analysis identified two clinical and five psychosocial baseline predictors for one-year U-RTW (primary outcome). The clinical predictors included pain score (back+leg pain) and side-flexion. The five psychosocial predictors included 'bodily distress' 'low expectations of RTW', 'blaming the work for pain', 'no home ownership' and 'drinking alcohol less than once/month'. These predictors were not statistically significantly different in patients with and without radiculopathy, and they also predicted initial U-RTW (secondary outcome). Obesity and older age were only supplementary predictors in patients with radiculopathy. A prediction model was established and tested in the validation study group. The model predicted one-year U-RTW in patients with intermediate and high risk, but only partially in patients with low risk. The model predicted all three risk categories in initial U-RTW.

#### **CONCLUSIONS:**

A prediction model combining baseline clinical and psychosocial risk factors predicted patients with low, intermediate and high risk for unsuccessful return to work, both initially and at 1-year.

PMID:23597088

Migraine/blood pressure

[Pain Med.](#) 2013 Apr 8. doi: 10.1111/pme.12105. [Epub ahead of print]

**Duration of Migraine Is Associated with Cardiac Diastolic Dysfunction.**

[Ekici B](#), [Unal-Cevik I](#), [Akgul-Ercan E](#), [Morkavuk G](#), [Yakut Y](#), [Erkan AF](#).

**Source**

Department of Cardiology, Faculty of Medicine, Ufuk University, Ankara, Turkey.

**Abstract**

**OBJECTIVE.:** Migraine is a common type of headache accompanied or preceded by signs of central and autonomic nervous system dysfunction. Autonomic dysfunction has been suggested to be a potential contributor to impaired cardiac diastolic function. Cardiac diastolic dysfunction is characterized by normal left ventricular contractility but impaired ventricular relaxation. It is a growing clinical entity implicated in morbidity and mortality due to heart failure. The aim of this study was to determine if any relationship exists between migraine and diastolic dysfunction. **METHODS.:** Migraineurs (N = 55), and age- and sex-matched healthy controls (N = 52) were evaluated by conventional and tissue Doppler echocardiography. Migraine-related disability in the previous 3 months was assessed by the Migraine Disability Assessment questionnaire. Baseline characteristics were recorded, and blood samples were collected. **RESULTS.:** The groups did not differ in terms of sex or age. The migraine group had higher lipid levels compared with the control group. Diastolic dysfunction was significantly higher among the 30 migraineurs with a history of migraine of 10 years or more compared with the 25 migraineurs with a history of less than 10 years, (P = 0.003). In logistic regression analysis, migraine duration was shown to be an independent predictor of diastolic dysfunction (odds ratio 1.130, 95% confidence interval, P = 0.044). **CONCLUSIONS.:** Cardiac diastolic dysfunction is associated with migraine. A long history of migraine is an independent predictor of diastolic dysfunction.

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PMID:23565859

Pain/Knee

[Pain Med.](#) 2013 Apr 16. doi: 10.1111/pme.12093. [Epub ahead of print]

**Experimental Knee Pain Evoke Spreading Hyperalgesia and Facilitated Temporal Summation of Pain.**

[Joergensen TS](#), [Henriksen M](#), [Danneskiold-Samsoe B](#), [Bliddal H](#), [Graven-Nielsen T](#).

**Source**

Laboratory for Musculoskeletal Pain and Motor Control, Center for Sensory-Motor Interaction (SMI), Department of Health Science and Technology, Aalborg University, Aalborg; Clinical Motor Function Laboratory, The Parker Institute, Department of Rheumatology, Copenhagen University Hospital, Frederiksberg, Denmark.

**Abstract**

**OBJECTIVES:**

This study evaluated the deep-tissue pressure pain sensitivity and temporal summation of pain within and around healthy knees exposed to experimental pain.

**DESIGN:**

The study was designed as a randomized crossover trial, with each subject tested on 1 day.

**SETTING:**

All tests were carried out at the Laboratory for Musculoskeletal Pain and Motor Control, Center for Sensory-Motor Interaction, Department of Health Science and Technology at Aalborg University, Denmark.

**SUBJECTS:**

Seventeen healthy subjects (10 males) participated in this study.

**INTERVENTIONS:**

Experimental pain model. Pain was induced in the infrapatellar fat pad by injection of hypertonic saline and the contralateral infrapatellar fat pad was injected with isotonic saline as control.

**OUTCOME MEASURES:**

Pressure pain thresholds, temporal summation of pressure pain, and cutaneous mechanosensitivity were assessed on three occasions: baseline, immediately after the injection, and when pain had vanished. Assessments sites were located in the peripatellar region, vastus lateralis, and tibialis anterior muscles.

**RESULTS:**

The experimental knee pain model demonstrated 1) hyperalgesia to pressure stimulation on the infrapatellar fat pad during experimental pain, and 2) facilitated temporal summation of pressure pain at the infrapatellar fat pad and knee-related muscles.

**CONCLUSION:**

The increased sensitivity and temporal summation found in this study were exclusive to deep-tissue with no contralateral decreased pain sensitivity. The study showed that acute knee joint pain leads to hyperalgesia and facilitated temporal summation in the infrapatellar fat pad and in muscles located distant to the injection site, in subjects with no history of knee pain.

Wiley Periodicals, Inc.

PMID:23590407

Headaches/youth/obesity

[Headache](#). 2013 Apr 10. doi: 10.1111/head.12088. [Epub ahead of print]

**Obesity in Children With Headaches: Association With Headache Type, Frequency, and Disability.**

[Ravid S](#), [Shahar E](#), [Schiff A](#), [Gordon S](#).

**Source**

Child Neurology Unit, Meyer Children's Hospital, Rambam Health Care Campus, Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel.

**Abstract**

**OBJECTIVE:**

To examine the association between obesity and the different types of primary headaches, and the relation to headache frequency and disability **BACKGROUND:** The association between obesity and headache has been well established in adults, but only a few studies have examined this association in children, in particular, the relationship between obesity and different types of primary headaches.

**METHODS:**

The authors retrospectively evaluated 181 children evaluated for headaches as their primary complaint between 2006 and 2007 in their Pediatric Neurology Clinic. Data regarding age, gender, headache type, frequency, and disability, along with height and weight were collected. Body mass index was calculated, and percentiles were determined for age and sex. Headache type and features were compared among normal weight, at risk for overweight, and overweight children.

**RESULTS:**

A higher prevalence (39.8%) of obesity was found in our study group compared with the general population. The diagnosis of migraine, but not of tension-type headache, was significantly associated with being at risk for overweight (odds ratio [OR] = 2.37, 95% confidence interval 1.21-4.67, P = .01) or overweight (OR = 2.29, 95% confidence interval 0.95-5.56, P = .04). A significant independent risk for overweight was present in females with migraine (OR = 4.93, 1.46-8.61, P = .006). Regardless of headache type, a high body mass index percentile was associated with increased headache frequency and disability, but not with duration of attack.

**CONCLUSIONS:**

Obesity and primary headaches in children are associated. Although obesity seems to be a risk factor for migraine more than for tension-type headache, it is associated with increased headache frequency and disability regardless of headache type.

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PMID:23574609

[Dev Med Child Neurol.](#) 2013 Apr 5. doi: 10.1111/dmcn.12152. [Epub ahead of print]

**Characteristics of post-traumatic headaches in children following mild traumatic brain injury and their response to treatment: a prospective cohort.**

[Kuczynski A](#), [Crawford S](#), [Bodell L](#), [Dewey D](#), [Barlow KM](#).

**Source**

University of Calgary, Calgary, AB, Canada.

**Abstract**

**AIM:**

Post-traumatic headaches (PTHs) following mild traumatic brain injury (mTBI) are common; however, few studies have examined the characteristics of PTHs or their response to treatment. The aims of this study were (1) to describe the clinical characteristics of PTH in a prospective cohort of children presenting to a paediatric emergency department with mTBI, and (2) to evaluate the response of PTH to treatment.

**METHOD:**

The emergency department cohort was obtained from a prospective longitudinal cohort study of symptoms following mTBI (n=670; 385 males, 285 females) and a comparison group of children with extracranial injury (n=120; 61 males, 59 females). A retrospective chart review of a separate cohort of children from a brain injury clinic (the treatment cohort) treated for PTH was performed (n=44; 29 females, 15 males; mean age 14y 1mo, SD 3y 1mo). The median time since injury was 6.9 months (range 1-29mo). The mean follow-up interval after treatment started was 5.5 weeks (SD 4.3wks).

**RESULTS:**

Among the emergency department cohort (n=39; 20 males, 19 females; mean age 11y 1mo, SD 4y 3mo) 11% of children were symptomatic with PTHs at a mean of 15.8 days (SD 11.6d) post injury. Three months post injury, 7.8% of children complained of headaches; of those, 56% had pre-existing headaches and 18% had experienced migraine before the injury. Although headache type varied, 55% met the criteria for migraine. A family or past medical history of migraine was present in 82% of cases. Among the treatment cohort, medications included amitriptyline, flunarizine, topiramate, and melatonin, with an overall response rate of 64%.

**CONCLUSION:**

This is the first prospective cohort study to describe the clinical characteristics of PTHs following mTBI in children. Migraine was the most common headache type seen; other headaches included tension-type, cervicogenic, and occipital neuralgias, and 64% responded to treatment. Referral to a headache specialist should be considered, especially when the features are not typical of one of the primary headache disorders.

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PMID:23560811

## Shoulder/impingement/manual therapy

[J Bodyw Mov Ther.](#) 2013 Apr;17(2):212-8. doi: 10.1016/j.jbmt.2012.07.004. Epub 2012 Aug 4.

### **Shoulder functionality after manual therapy in subjects with shoulder impingement syndrome: A case series.**

[Heredia-Rizo AM](#), [López-Hervás A](#), [Herrera-Monge P](#), [Gutiérrez-Leonard A](#), [Piña-Pozo F](#).

#### **Source**

Department of Physiotherapy, Faculty of Nursing, Physiotherapy and Podiatry, University of Sevilla, Spain. Electronic address: amheredia@us.es.

#### **Abstract**

The aim of the study was to identify the differences in functionality of the upper limb in subjects suffering from shoulder impingement syndrome after intervention by two manual therapy protocols. Randomized, single-blind study with a sample of 22 subjects ( $58 \pm 10.86$  years old) divided into two groups. The conventional-group ( $n = 11$ ) received mobilizations of the shoulder and the experimental-group ( $n = 11$ ) was treated with soft tissue techniques in the cervical and upper thoracic regions. These two groups received electrotherapy and postural advices. The treatment lasted three weeks (15 daily sessions of 1 h and 30 min). Both active and passive range of motion (ROM) and self-perceived functionality of the upper limb (DASH questionnaire) were measured. The experimental group showed a significant improvement in the DASH scores and both groups improved mobility in the intra-group comparison pre-intervention versus post-intervention ( $p < .05$ ), but not statistically significant differences were found in the between-group comparison ( $p > .05$ ). Our results suggest that a combined treatment with electrotherapy, postural hygiene and manual therapy, regardless of the protocol, improves shoulder mobility and functionality.

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PMID:23561869

## Manual Therapy/myofascial injuries

[J Bodyw Mov Ther.](#) 2013 Apr;17(2):221-34. doi: 10.1016/j.jbmt.2012.08.006. Epub 2012 Sep 20.

### **Mechanistic basis of manual therapy in myofascial injuries. Sonoelastographic evolution control.**

[Martínez Rodríguez R](#), [Galán Del Río F](#).

#### **Source**

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#### **Abstract**

The term myofascia is referred to the skeleton of muscle fibres organized as an interconnected 3D network that surrounds and connects the musculoskeletal system. Extracellular matrix muscle is relevant in tissue structural support and transmission of mechanical signals between fibres and tendons. Acute and chronic musculoskeletal injuries (muscle strain) are one of the major problems faced by those who practice any type of sport, regardless of whether they are professionals or amateurs. Therapeutic boarding is of uncertain value in most cases because there are many contributing factors such as type, severity, functional implication of the damaged tissue, progression or risk of relapse. Different studies suggest that the musculoskeletal cell matrix is essential for the development, maintenance and regeneration of skeletal muscle. In this article, we highlight the action of "non-contractile" structures, in particular the myofascial system or muscle fascia, which can be responsible for the pathophysiology and healing process of muscular injuries. Manual therapy plays a predominant role in the treatment of these types of injuries and is key in the process of obtaining a scar capable of transmitting mechanical information. The scientific basis of this process is described in this article. Through real-time sonoelastography we have accurate information regarding the current stage of the repair process and, thus, guide our treatment at all times. Some new concepts are introduced, including local elasticity, the relationship between fascial pretension and the different stages of the physiological myofascia repair process, scar modelling technique, and sonoelastographic evolution control.

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PMID:23561871

## Manipulation/Upper T spine/CV response

[J Manipulative Physiol Ther.](#) 2013 Feb;36(2):101-10. doi: 10.1016/j.jmpt.2013.01.003.

### **Immediate effects of anterior upper thoracic spine manipulation on cardiovascular response.**

[Ward J](#), [Coats J](#), [Tyer K](#), [Weigand S](#), [Williams G](#).

#### **Source**

Assistant Professor, Department of Physiology and Chemistry, Pasadena, TX. Electronic address: [jward@txchiro.edu](mailto:jward@txchiro.edu).

#### **Abstract**

##### **OBJECTIVE:**

The aims of this study were (1) to determine if there were statistically significant immediate effects of anterior upper thoracic chiropractic manipulative therapy on cardiovascular response in normotensive individuals and (2) to quantify responses if any were found.

##### **METHODS:**

Thirty-six chiropractic college students (age,  $26.8 \pm 4.6$  years; height,  $1.71 \pm 0.12$  m; body mass,  $75.6 \pm 20.0$  kg; mean  $\pm$  SD) were equally randomized into a single-blind, controlled trial involving 3 study groups: anterior thoracic manipulation of T1-4, Activator-based placebo manipulation, or a "no T-spine contact" control. Outcome measures were electrocardiogram, bilateral pulse oximetry, and bilateral blood pressure measurement performed at baseline, post 1-minute intervention, post 10-minute intervention, and post 24-hour ( $\pm 1$  hour) intervention. Between-group dependent variables were analyzed through 1-way analysis of variance at each of the 4 time points. Within-group dependent variables were analyzed through 2 paired-samples t tests comparing baseline to post 10 minutes and again between baseline to post 24 hours ( $\pm 1$  hr).

##### **RESULTS:**

No statistically significant difference was shown amongst any between-group or within-group cardiovascular dependent variables in this study.

##### **CONCLUSIONS:**

The results of this study suggest cardiovascular physiologic responses are not affected in the short term by anterior upper thoracic spine chiropractic manipulative therapy in young normotensive individuals.

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PMID:23499145

[Strength/Endurance/Training](#)

[J Strength Cond Res.](#) 2013 Mar 21. [Epub ahead of print]

**PERFORMANCE AND NEUROMUSCULAR ADAPTATIONS FOLLOWING DIFFERING RATIOS OF CONCURRENT STRENGTH AND ENDURANCE TRAINING.**

[Jones TW](#), [Howatson G](#), [Russell M](#), [French DN](#).

**Source**

1Department of Sport and Exercise Science, Northumbria University, Newcastle upon Tyne, United Kingdom 2Water Research Group, School of Environmental Sciences and Development, North West University, Potchefstroom, South Africa.

**Abstract**

The interference effect attenuates strength and hypertrophic responses when strength and endurance training are conducted concurrently; however, the influence of training frequency upon these responses remain unclear when varying ratios of concurrent strength and endurance training are performed. Therefore the purpose of the study was to examine the strength, limb girth and neuromuscular adaptations to varying ratios of concurrent strength and endurance training. Twenty four men with >2 years resistance training experience completed 6 weeks of 3 d·wk of i) strength training (ST), ii) concurrent strength and endurance training ratio 3:1 (CT3), iii) concurrent strength and endurance training ratio 1:1 (CT1) or iv) no training (CON) in an isolated limb model. Assessments of maximal voluntary contraction via isokinetic dynamometry leg extensions (MVC), limb girth and neuromuscular responses via electromyography (EMG) were conducted at baseline, mid-intervention and post-intervention. Following training, ST and CT3 conditions elicited greater MVC increases than CT1 and CON conditions ( $P \leq 0.05$ ). ST resulted in significantly greater increases in limb girth than both CT1 and CON conditions ( $P = 0.05$  and  $0.004$  respectively). CT3 induced significantly greater limb girth adaptations than CON condition ( $P = 0.04$ ). No effect of time or intervention was observed for EMG ( $P > 0.05$ ). In conclusion greater frequencies of endurance training performed increased the magnitude of the interference response on strength and limb girth responses following 6 weeks of 3-d· of training. Therefore, the frequency of endurance training should remain low if the primary focus of the training intervention is strength and hypertrophy.

PMID:24363

## Stretching

[J Strength Cond Res.](#) 2013 Mar 21. [Epub ahead of print]

### **Acute effects of different stretching durations on passive torque, mobility, and isometric muscle force.**

[Matsuo S](#), [Suzuki S](#), [Iwata M](#), [Banno Y](#), [Asai Y](#), [Tsuchida W](#), [Inoue T](#).

#### **Source**

1Program in Physical and Occupational Therapy, Graduate School of Medicine, Nagoya University, Nagoya, Japan 2Department of Rehabilitation, Faculty of Health Sciences, Nihon Fukushi University, Handa, Japan 3Department of Rehabilitation, Nagoya University Hospital, Nagoya, Japan.

#### **Abstract**

Static stretching is widely applied in various disciplines. However, the acute effects of different durations of stretching are unclear. Therefore, the present study was designed to investigate the acute effects of different stretching durations on muscle function and flexibility, and provide insight into the optimal duration of static stretching. This randomized crossover trial included 24 healthy students (17 men and 7 women) who stretched their right hamstrings for durations of 20, 60, 180, and 300 s in a random order. The following outcomes were assessed using an isokinetic dynamometer as markers of lower limb function and flexibility: static passive torque (SPT), dynamic passive torque (DPT), stiffness, straight leg raise (SLR), and isometric muscle force. SPT was significantly decreased after all stretching durations ( $p < 0.05$ ). SPT was significantly lower after 60, 180, and 300 s of stretching compared with after 20-s stretching, and stiffness decreased significantly after 180- and 300-s stretching ( $p < 0.05$ ). In addition, DPT and stiffness were significantly lower after 300 s than after 20-s stretching ( $p < 0.05$ ), and SLR increased significantly after all stretching durations ( $p < 0.05$ ). SLR was higher after 180- and 300-s stretching than after 20-s stretching and higher after 300-s stretching than after 60-s stretching ( $p < 0.05$ ). Isometric muscle force significantly decreased after all stretching durations ( $p < 0.05$ ). Therefore, increased duration of stretching is associated with a decrease in SPT but an increase in SLR. Over 180 s of stretching was required to decrease DPT and stiffness, but isometric muscle force decreased regardless of stretching duration. In conclusion, these results indicate that longer durations of stretching are needed to provide better flexibility.

PMID:23524367

## Lumbar spine

[Man Ther.](#) 2013 Mar 6. pii: S1356-689X(13)00030-1. doi: 10.1016/j.math.2013.02.001. [Epub ahead of print]

### **Upper and lower lumbar segments move differently during sit-to-stand.**

[Parkinson S](#), [Campbell A](#), [Dankaerts W](#), [Burnett A](#), [O'Sullivan P](#).

#### **Source**

School of Physiotherapy and Curtin Health Innovation Research Institute, Curtin University, Perth, Western Australia 6845, Australia. Electronic address: S.Parkinson@curtin.edu.au.

#### **Abstract**

Sit-to-stand (STS) is a functional dynamic task, requiring movement of the lumbar spine, however, little is known about whether regional differences or between-gender differences exist during this task. The aim of this study was to confirm whether kinematic differences existed within regions of the lumbar spine during STS and also to determine whether between-gender differences were evident. An electromagnetic measurement device, recording at 25 Hz, determined how different lumbar spine regions (combined, lower and upper) moved during STS in 29 healthy participants (16 males, 13 females). Discrete outputs including mean range of motion (ROM), maximum and minimum were calculated for each lumbar spine region. Analyses of covariance (ANCOVA) with repeated measures were used to determine whether regional differences and between-gender differences were evident in the lumbar spine during STS. With the lumbar spine modelled as two segments, the lower lumbar (LLx) and upper lumbar (ULx) regions made different contributions to STS:  $F_{1,27} = 21.8$ ;  $p < 0.001$ . No between-gender differences were found with the lumbar spine modelled as a single region (combined lumbar: CLx), however, modelled as two regions there was a significant gender difference between the LLx and ULx regions:  $F_{1,27} = 7.3$  ( $p = 0.012$ ). The results indicate that modelling the lumbar spine as a single segment during STS does not adequately represent lumbar spine kinematics and there are important gender differences. These findings also need to be considered when investigating STS in clinical populations.

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PMID:23473753

## LBP/Fusion

### [European Spine Journal](#)

April 2013

#### **Can decompression surgery relieve low back pain in patients with lumbar spinal stenosis combined with degenerative lumbar scoliosis?**

- [Shunji Tsutsui](#),
- [Ryohei Kagotani](#),
- [Hiroshi Yamada](#),
- [Hiroshi Hashizume](#),
- [Akihito Minamide](#),
- [Yukihiro Nakagawa](#),
- [Hiroshi Iwasaki](#),
- [Munehito Yoshida](#)

#### Introduction

Decompression with fusion is usually recommended in patients with lumbar spinal stenosis (LSS) combined with degenerative lumbar scoliosis (DLS). However, elderly patients with LSS and DLS often have other comorbidities, and surgical treatment must be both safe and effective. The aim of this study was to investigate whether decompression surgery alone alleviates low back pain (LBP) in patients with LSS and DLS, and to identify the predictors of postoperative residual LBP.

#### Materials and methods

A total of 75 patients (33 males and 42 females) with a mean age of 71.8 years (range 53–86 years) who underwent decompression surgery for LSS with DLS (Cobb angle  $\geq 10^\circ$ ) and had a minimum follow-up period of 1 year, were retrospectively reviewed using the Japanese Orthopaedic Association scoring system for the assessment of lumbar spinal diseases (JOA score). Radiographic measurements included coronal and sagittal Cobb angles, apical vertebral rotation (Nash-Moe method), and anteroposterior and lateral spondylolisthesis. Logistic regression analysis was performed to investigate the predictors of residual LBP after surgery.

#### Results

Forty-nine patients had preoperative LBP, of which 29 (59.1 %) experienced postoperative relief of LBP. Logistic regression analysis demonstrated that the degree of apical vertebral rotation on preoperative radiography was significantly associated with postoperative residual LBP (odds ratio, 8.16, 95 % confidence interval, 1.55–83.81,  $p = 0.011$ ).

#### Conclusion

A higher degree of apical vertebral rotation may therefore be an indicator of mechanical LBP in patients with LSS and DLS. Decompression with fusion should be recommended in these patients.

## Disc replacement/LBP

### Effect of total lumbar disc replacement on the treatment of discogenic low lumbar pain: preliminary outcomes *Full Text*

Chinese Medical Journal, 04/24/2013 Clinical Article

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#### Abstract:

**Background** Lumbar pedicle screw fixation and fusion are major procedures for treating discogenic low back pain (DLBP). However, due to its advantages of preserving the segmental motion and biomechanical simulation, artificial total lumbar disc replacement (TDR) is increasingly popular.

**Methods** From 2007 to 2010, 68 DLBP patients were enrolled. TDR were performed on 34 patients and the other 34 controls underwent the traditional fixation procedure. Qualitative and quantitative evaluations were followed including the changes in range of motion (ROM) and interpedicle height (IPH) at the posterior intervertebral body of operated level, in 6 and 12 months, and 3 years, postoperatively.

**Results** Qualitative results showed satisfying improvement in the two groups after 6 and 12 months, respectively, and the inter-group differences were significant ( $P > 0.05$ ). The results of ROM and IPH have shown significant differences between the TDR and spinal fusion groups ( $P < 0.05$ ).

**Conclusion** With similar clinical improvements as the traditional spinal fusion method, TDR offered significantly better ROM and intervertebral foramen height.

## LBP/Axial Rotation/Disc

### [European Spine Journal](#)

April 2013,

Low back pain development response to sustained trunk axial twisting

- [Xinhai Shan](#),
- [Xiaopeng Ning](#),
- [Zhentao Chen](#),
- [Meng Ding](#),
- [Weifei Shi](#),
- [Shulong Yang](#)

#### Abstract

##### Purpose

To investigate if there is an effect of sustained trunk axial twisting on the development of low back pain.

##### Methods

Sixteen male pain-free university students volunteered for this study. The trunk axial twisting was created by a torsion moment of 50 Nm for 10-min duration. The axial rotational creep was estimated by the transverse camera view directly on the top of the head. The visual analog scale in low back area was examined both in the initial and at the end of twisting. Each performed three trials of lumbar flexion–extension with the cycle of 5 s flexion and 5 s extension in standing before and after twisting. Surface electromyography from bilateral erector spinae muscles as well as trunk flexion performance was recorded synchronously in video camera. A one-way ANOVA with repeated measures was used to evaluate the effect of twist.

##### Results

The results showed that there was a significant ( $p < 0.001$ ) twist creep with rotational angle  $10.5^\circ$  as well as VAS increase with a mean value 45 mm. The erector spinae was active in a larger angle during flexion as well as extension after trunk axial twisting.

##### Conclusions

Sustained trunk axial twisting elicits significant trunk rotational creep. It causes the visual analog scale to have a significant increase, and causes erector spinae muscles to become active longer during anterior flexion as well as extension, which may be linked to the decrease of the tension ability of passive tissues in low back area, indicating a higher risk in developing low back pain.

## LBP/LIFTING

[Int Arch Occup Environ Health](#). 2012 May 15. [Epub ahead of print]

### **Risk for low back pain from different frequencies, load mass and trunk postures of lifting and carrying among female healthcare workers.**

[Holtermann A](#), [Clausen T](#), [Aust B](#), [Mortensen OS](#), [Andersen LL](#).

#### **Source**

National Research Centre for the Working Environment, Lersø Parkalle 105, 2100, Copenhagen Ø, Denmark, aho@nrcwe.dk.

#### **Abstract**

##### **PURPOSE:**

To investigate the risk of developing non-chronic and chronic low back pain (LBP) from frequency, load mass and trunk postures of occupational lifting and carrying among female healthcare workers.

##### **METHODS:**

A total of 9,847 workers in eldercare answered a questionnaire about occupational lifting and carrying frequency (rarely, occasionally and frequently), load mass (low: 1-7 kg, moderate: 8-30 kg and heavy: >30 kg), trunk posture (upright or forward bent back), and days with LBP in 2005. The odds ratio (OR) for developing non-chronic (1-30 days the last 12 months) and chronic (>30 days the last 12 months) LBP reported in 2006 from these characteristics of occupational lifting and carrying was investigated with multi-adjusted logistic regressions among female healthcare workers without LBP in 2005 (n = 1,612).

##### **RESULTS:**

Frequently lifting and carrying low load mass with forward bent back doubled the risk for developing chronic LBP (OR: 2.14; 95 % CI: 1.02-4.50). Occasionally and frequently lifting or carrying of any load mass with upright back did not increase the risk for chronic LBP. Lifting and carrying did not increase the risk for non-chronic LBP.

##### **CONCLUSIONS:**

Preventive initiatives for LBP among healthcare workers ought to pay attention to frequent lifting and carrying of low load mass with forward bent back.

PMID:22585061

## Fibromyalgia/fascial pain

[Phys Ther.](#) 2013 Apr 18. [Epub ahead of print]

### **Facial Pain Associated With Fibromyalgia Can Be Marked by Abnormal Neuromuscular Control: A Cross-Sectional Study.**

[Gui MS](#), [Pedroni CR](#), [Aquino LM](#), [Pimentel MJ](#), [Alves MC](#), [Rossini S](#), [Reimao R](#), [Berzin F](#), [Marques AP](#), [Rizzatti-Barbosa CM](#).

#### **Source**

M.S. Gui, Department of Anatomy, Piracicaba Dental School, University of Campinas, Piracicaba, Sao Paulo, Brazil. Mailing address: Joao Bueno Filho Street, 41, Montezuma, Brazil 13480-358.

#### **Abstract**

##### **BACKGROUND:**

Temporomandibular disorder (TMD) development in fibromyalgia syndrome (FMS) is not yet fully understood but altered neuromuscular control in FMS may play a role in triggering TMD.

##### **OBJECTIVE:**

The purpose of this study was to verify the association between neuromuscular control and chronic facial pain in groups of patients with FMS and TMD.

##### **DESIGN:**

A cross-sectional study was conducted.

##### **METHODS:**

This study involved an analysis of facial pain, electromyographic amplitude and frequency of masticatory muscles in patients with FMS (n=27) and TMD (n=28). All subjects were evaluated according to RDC/TMD and surface electromyography (SEMG). Myoelectric signal calculations were performed using the Root Mean Square (RMS) and Median Frequency (MNF) of signals.

##### **RESULTS:**

Our data reveals premature interruption of masticatory muscle contraction in both patient groups but a significant correlation was also found between higher MNF values and increased facial pain. This is probably related to FMS since this correlation was not found in patients with TMD only. Facial pain and increased SEMG activity during mandibular rest were also positively correlated.

##### **LIMITATIONS:**

Temporal conclusions cannot be drawn from our study. Also, the study lacked a comparison group of patients with FMS without TMD as well as a healthy control group.

##### **CONCLUSIONS:**

Altered neuromuscular control in masticatory muscles may be correlated with perceived facial pain in patients with FMS.

PMID:23599350

## Injections/hand

### HAND

April 2013

Disability and pain after cortisone versus placebo injection for trapeziometacarpal arthrosis and de Quervain syndrome

- Dennis J. S. Makarawung,
- Stéphanie J. E. Becker,
- Stijn Bekkers,
- David RingTop of Form

#### Abstract

##### Background

This study tested the null hypothesis that type of injection (corticosteroid vs. placebo) is not a predictor of arm-specific disability as measured with the Disabilities of Arm, Shoulder and Hand questionnaire 1 to 3 months after injection of dexamethasone or placebo for treatment of trapeziometacarpal (TMC) arthrosis or de Quervain syndrome. Secondly, we tested if type of injection was a predictor of pain intensity.

##### Methods

Thirty-six English-speaking adults with TMC arthrosis or de Quervain syndrome were randomized for a dexamethasone or a placebo injection. At time of the injection, patients completed a demographic data sheet and validated questionnaires assessing arm-specific disability, pain intensity, depressive symptoms, pain catastrophizing, and patient's health-related beliefs. At an average of  $1.4 \pm 0.42$  months (range, 0.79–2.5 months) after the injection, patients completed questionnaires regarding arm-specific disability, pain, and treatment satisfaction. Grip and pinch strength measurements were measured at both time points. Bivariable and multivariable analyses assessed predictors of arm-specific disability and pain intensity at follow-up.

##### Results

Type of injection was not a predictor of arm-specific disability or pain intensity 1 to 3 months after injection. The best model both for arm-specific disability and pain intensity at follow-up included pain catastrophizing and explained 18 % and 33 % of the variability, respectively.

##### Conclusions

Catastrophic thinking was a better predictor of both of arm-specific disability and pain intensity than diagnosis or type of injection (steroid vs. placebo) 1 to 3 months after an injection.

## Chronic pain/Bipolar disorder

[BMC Psychiatry](#). 2013 Apr 15;13(1):112. [Epub ahead of print]

### **Factors associated with chronic pain in patients with bipolar depression: a cross-sectional study.**

[Failde I](#), [Dueñas M](#), [Agüera-Ortíz L](#), [Cervilla JA](#), [Gonzalez-Pinto A](#), [Mico JA](#).

#### **Abstract**

#### **BACKGROUND:**

While pain is frequently associated with unipolar depression, few studies have investigated the link between pain and bipolar depression. In the present study we estimated the prevalence and characteristics of pain among patients with bipolar depression treated by psychiatrists in their regular clinical practice. The study was designed to identify factors associated with the manifestation of pain in these patients.

#### **METHODS:**

Patients diagnosed with bipolar disorder (n=121) were selected to participate in a cross-sectional study in which DSM-IV-TR criteria were employed to identify depressive episodes. The patients were asked to describe any pain experienced during the study, and in the 6 weeks beforehand, by means of a Visual Analogical Scale (VAS).

#### **RESULTS:**

Over half of the bipolar depressed patients (51.2%, 95% CI: 41.9%-60.6%), and 2/3 of the female experienced concomitant pain. The pain was of moderate to severe intensity and prolonged duration, and it occurred at multiple sites, significantly limiting the patient's everyday activities. The most important factors associated with the presence of pain were older age, sleep disorders and delayed diagnosis of bipolar disorder.

#### **CONCLUSIONS:**

Chronic pain is common in bipolar depressed patients, and it is related to sleep disorders and delayed diagnosis of their disorder. More attention should be paid to study the presence of pain in bipolar depressed patients, in order to achieve more accurate diagnoses and to provide better treatment options.

PMID:23587328

## Chronic pain/Smoking

[Pain Pract.](#) 2013 Apr 12. doi: 10.1111/papr.12067. [Epub ahead of print]

### **Smoking and Chronic Pain Among People Aged 65 Years and Older.**

[Jakobsson U](#), [Larsson C](#).

#### **Source**

Center for Primary Health Care Research, Faculty of Medicine, Lund University, Malmö, Sweden.

#### **Abstract**

##### **OBJECTIVE:**

To study the relationship between smoking and chronic pain among people aged 65+ years.

##### **DESIGN:**

A cross-sectional study.

##### **SAMPLE:**

The study was carried out in 2011 and included a randomly selected (N = 2000, response rate 57%) sample of people aged 65 years and older, living in Sweden.

##### **MEASUREMENT:**

A postal questionnaire with questions about demographic data, living conditions, tobacco use (both smoking and moist snuff), subjective health, and chronic pain (eg, intensity, duration, location). Chronic pain was defined as a pain lasting for 3 months or longer.

##### **RESULTS:**

In the total sample (n = 1141, aged 65 to 103 years), 53.6% were women, 38.5% reported chronic pain, and 9% were smokers. Among the smokers were 47.6% reporting chronic pain. When comparing smokers and nonsmokers, there was a significant difference only in pain intensity but not in prevalence. However, when the sample was divided by gender, significant differences were found in both prevalence and intensity among women, but only in intensity among men. No association was found between moist snuff and pain.

##### **CONCLUSIONS:**

There was an association between smoking and chronic pain among older people, especially regarding pain intensity. This indicates that interventions to help people cease smoking may be one way (among other methods) to ease pain intensity among older people.

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PMID:23578137

## Pelvic Pain/Depression

[World J Urol.](#) 2013 Apr 9. [Epub ahead of print]

### **A 2-year follow-up of quality of life, pain, and psychosocial factors in patients with chronic prostatitis/chronic pelvic pain syndrome and their spouses.**

[Tripp DA](#), [Nickel JC](#), [Shoskes D](#), [Koljuskov A](#).

#### **Source**

Departments of Psychology, Anesthesiology and Urology, Queen's University, Humphrey Hall, 62 Arch Street, Kingston, ON, K7L 3N6, Canada, dean.tripp@queensu.ca.

#### **Abstract**

##### **OBJECTIVES:**

There are two objectives: (1) Examine quality of life (QoL) and mood between chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) patients and spouses over a 2-year period; (2) Longitudinally assess CP/CPPS patient pain, disability, and pain catastrophizing over a 2-year period.

##### **METHODS:**

Forty-four CP/CPPS diagnosed men and their spouses participated. Patients completed demographics, QoL, depression, anxiety, pain, disability, and catastrophizing across the study. Spouses completed QoL, depression, and anxiety. Patients/spouses were not different in education, but patients were older (49 years; SD = 9.56). The average symptom duration was 8.68 (SD = 7.61). Couples were married or common law, and majority of patients were employed. Due to attrition, approximately 21 couples provided analyzable data.

##### **RESULTS:**

Patients and spouses physical QoL did not statistically differ over time from one another, and both increased over the study period. Mental QoL increased over time, but patients reported lower QoL. Patients reported more depression and anxiety, but both measures remained stable over time for spouses and patients. Finally, patient only analyses showed that disability did decrease over time from a high at 6 months, but pain and catastrophizing showed stability over the 2 years.

##### **CONCLUSIONS:**

Patients reported worse mental QoL, depression, and anxiety compared to spouses, and spouses reported significant stable levels of depression and anxiety similar to patients. Further, patient catastrophizing, pain, and disability did not reduce over the 2-year assessment period. These results provide further impetus for the development and implementation of mental health strategies alongside continued medical efforts in couples suffering from CP/CPPS.

PMID:23568443

## Total hip/knee/psychological

[J Pain](#). 2013 Mar 27. pii: S1526-5900(13)00035-7. doi: 10.1016/j.jpain.2012.12.020. [Epub ahead of print]

### **Predictors of Acute Postsurgical Pain and Anxiety Following Primary Total Hip and Knee Arthroplasty.**

[Pinto PR](#), [McIntyre T](#), [Ferrero R](#), [Almeida A](#), [Araújo-Soares V](#).

#### **Source**

Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho, Braga, Portugal; ICVS/3B's - PT Government Associate Laboratory, Braga/Guimarães, Portugal; Health Psychology Group, Newcastle University, Institute of Health & Society, Newcastle, United Kingdom.

#### **Abstract**

This study aims to examine the joint role of demographic, clinical, and psychological variables as predictors of acute postsurgical pain and anxiety in patients undergoing total knee arthroplasty and total hip arthroplasty. A consecutive sample of 124 patients was assessed 24 hours before (T1) and 48 hours after (T2) surgery. Demographic, clinical, and psychological factors were assessed at T1 and several postsurgical pain issues, anxiety, and analgesic consumption were evaluated at T2. Hierarchical linear regression analyses were performed to identify predictors of acute pain and anxiety following surgery. In the final multivariate model, presurgical optimism emerged as the main significant predictor of postsurgical pain intensity. Presurgical optimism also had a significant role in the prediction of postsurgical anxiety, together with presurgical anxiety level and emotional representation of the condition leading to surgery (osteoarthritis). A significant positive correlation between postsurgical anxiety and acute pain was also confirmed. The present study enhances our understanding of predictors of acute pain and anxiety following total knee arthroplasty and total hip arthroplasty by showing the relevance of psychological factors, over and above other potential clinical predictors. These findings could be used to develop targeted interventions aimed at acute postsurgical pain and anxiety management following major joint arthroplasties.

**PERSPECTIVE:** This article reveals the significant influence of psychological factors on the prediction of acute pain and anxiety 48 hours after primary total hip and knee arthroplasty. These results could prove useful for the design of interventions aimed at postsurgical pain and anxiety management.

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PMID:23541065

## Pain/Emotional

[Neuropsychologia](#). 2013 Apr 5. pii: S0028-3932(13)00090-0. doi:

10.1016/j.neuropsychologia.2013.03.018. [Epub ahead of print]

### **Cultural modulation of the neural correlates of emotional pain perception: The role of other-focusedness.**

[Cheon BK](#), [Im DM](#), [Harada T](#), [Kim JS](#), [Mathur VA](#), [Scimeca JM](#), [Parrish TB](#), [Park H](#), [Chiao JY](#).

### **Source**

Department of Psychology, Northwestern University. Electronic address:  
Bobbycheon2012@u.northwestern.edu.

### **Abstract**

Cultures vary in the extent to which they emphasize group members to habitually attend to the needs, perspectives, and internal experiences of others compared to the self. Here we examined the influence that collectivistic and individualistic cultural environments may play on the engagement of the neurobiological processes that underlie the perception and processing of emotional pain. Using cross-cultural fMRI, Korean and Caucasian-American participants passively viewed scenes of others in situations of emotional pain and distress. Regression analyses revealed that the value of other-focusedness was associated with heightened neural response within the affective pain matrix (i.e., anterior cingulate cortex and insula) to a greater extent for Korean relative to Caucasian-American participants. These findings suggest that mindsets promoting attunement to the subjective experience of others may be especially critical for pain-related and potentially empathic processing within collectivistic relative to individualistic cultural environments.

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PMID:23566889

## LBP/Clinical Prediction rules

[Spine \(Phila Pa 1976\)](#). 2012 Dec 11. [Epub ahead of print]

### **Systematic review of randomised controlled trials of clinical prediction rules for physical therapy in low back pain.**

[Patel S](#), [Friede T](#), [Froud R](#), [Evans DW](#), [Underwood M](#).

#### **Source**

1 University of Warwick, Warwick Clinical Trials Unit, Warwick Medical School, Gibbet Hill Road, Coventry, CV4 7AL, UK. 2 University Medical Centre Göttingen, Department of Medical Statistics, Humboldtallee 32, D-37073 Göttingen, Germany. 3 Centre for Primary Care and Public Health, Queen Mary University of London, Yvonne Carter Building, Turner Street, Whitechapel, London, E1 2AT, UK.

#### **Abstract**

ABSTRACT: Study Design: Systematic review

Objective: The objective of this review was to evaluate randomised controlled trials validating the effects of a clinical prediction rule for patients with non-specific low back pain. The outcomes of interest were any back pain or pain related measures.

Summary of background data: Low back pain is a common and costly condition. Interventions for back pain seem to have, at best, small to moderate mean beneficial effects. Identifying sub-groups of patients who may respond better to certain treatments may help to improve clinical outcomes in back pain. The development of clinical prediction rules is an attempt to determine who will respond best to certain treatments.

Methods: We conducted electronic searches of MEDLINE (1980-2009), EMBASE (1980-2009), PSYCINFO (1980-2009), AMED (1980-2009), PubMed (1980-2009), ISI Web of Knowledge (1980-2009) and the Cochrane Library (1980-2009). The reference lists of relevant articles were searched for further references.

Results: We identified 1,821 potential citations; three papers were included. The results from the available data do not support the use of clinical prediction rules in the management of non-specific low back pain.

Conclusion: There is a lack of good quality randomised controlled trials validating the effects of a clinical prediction rule for low back pain. Furthermore, there is no agreement on appropriate methodology for the validation and impact analysis. The evidence for, and development of, the existing prediction rules is generally weak.

PMID:23132535

## LBP/Yoga/Stretching

### Mediators of Yoga and Stretching for Chronic Low Back Pain *Full Text*

#### Evidence-based Complementary and Alternative Medicine , 04/23/2013 Clinical Article

Sherman KJ et al. - Although both self-efficacy and hours of back exercise were the strongest mediators for each intervention, compared to self-care, qualitative data suggest that they may exert their benefits through partially distinct mechanisms.

- Although yoga is an effective treatment for chronic low back pain, little is known about the mechanisms responsible for its benefits.
- In a trial comparing yoga to intensive stretching and self-care, the authors explored whether physical (hours of back exercise/week), cognitive (fear avoidance, body awareness, and self-efficacy), affective (psychological distress, perceived stress, positive states of mind, and sleep), and physiological factors (cortisol, DHEA) mediated the effects of yoga or stretching on back-related dysfunction (Roland-Morris Disability Scale (RDQ)).
- For yoga, 36% of the effect on 12-week RDQ was mediated by increased self-efficacy, 18% by sleep disturbance, 9% by hours of back exercise, and 61% by the best combination of all possible mediators (6 mediators).
- For stretching, 23% of the effect was mediated by increased self-efficacy, 14% by days of back exercise, and 50% by the best combination of all possible mediators (7 mediators).
- In open-ended questions,  $\geq 20\%$  of participants noted the following treatment benefits: learning new exercises (both groups), relaxation, increased awareness, and the benefits of breathing (yoga), benefits of regular practice (stretching).

LBP/Oswestry/EQ-5D

[Spine \(Phila Pa 1976\)](#). 2012 Nov 2. [Epub ahead of print]

**Comparison of the EQ-5D to the Oswestry Disability Index, Back and Leg Pain Scores in Patients With Degenerative Lumbar Spine Pathology.**

[Mueller B](#), [Carreon LY](#), [Glassman SD](#).

**Source**

Norton Leatherman Spine Center, 210 East Gray Street, Suite 900, Louisville, KY 40202.

**Abstract**

ABSTRACT: Study Design. Cross-Sectional

Objective. To evaluate the response behavior of EQ-5D compared to the Oswestry Disability Index (ODI), and back and leg pain scores.

Summary of Background Data. Recent changes in policies have highlighted the need for demonstration of both quality and cost effectiveness. In an effort to meet these requirements, surgeons are collecting health-related quality of life and utility data. Unfortunately, the burden of extensive data collection on both physician and patient is considerable. The EuroQOL-5D (EQ-5D) is a commonly used, easily administered, brief utility measure that can provide both clinical and utility data. The EQ-5D has not yet been validated in spine patients in comparison to established outcome measures.

Methods. EQ-5D, ODI, Back and Leg Pain (0 to 10) scores were collected as part of standard clinical practice. Spearman rank correlations between the ODI, back and leg pain scores and the EQ-5D were determined. A sub-analysis to determine dimension-specific effects was done. Data were categorized by level of low back disability and level of back and leg pain.

Results. Data from 8385 patients (5046 females, 3339 males), mean age 52 (range 18 to 96) were analyzed. There was a strong correlation between EQ-5D and ODI ( $r = -0.776$ ) and between EQ-5D and back pain ( $r = -0.648$ ); and moderate correlations between EQ-5D and leg pain scores ( $r = -0.538$ ). Increasing disability, as measured by ODI, lead to lower EQ-5D scores, with similar response behavior for both back and leg pain scores. All correlations were statistically significant at  $p < 0.0001$ .

Conclusion. The EQ-5D correlated well with established spine outcome measures, including ODI, and back and leg pain scores. EQ-5D correlated best with ODI scores. Correlation with back pain was stronger than leg pain, but all correlations were relatively strong. The EQ-5D can serve spine surgeons as an effective measure of clinical outcome and health utility for economic analysis.

PMID:23124265

Vit D./Knee pain

[Ann Rheum Dis.](#) 2013 Apr 17. [Epub ahead of print]

**Moderate vitamin D deficiency is associated with changes in knee and hip pain in older adults: a 5-year longitudinal study.**

[Laslett LL](#), [Quinn S](#), [Burgess JR](#), [Parameswaran V](#), [Winzenberg TM](#), [Jones G](#), [Ding C](#).

### Source

Menzies Research Institute Tasmania, University of Tasmania, Hobart, Tasmania, Australia.

### Abstract

#### **BACKGROUND:**

Vitamin D is important for bone, cartilage and muscle function but there are few studies on its association with joint pain.

#### **OBJECTIVE:**

To investigate whether serum vitamin D predicts change in knee and hip pain in older adults.

#### **METHODS:**

Longitudinal population-based cohort study of randomly selected older adults (n=769) aged 50-80 years (mean 62 years); 50% were male. Serum 25-hydroxyvitamin D (25-OHD) was assessed at baseline by radioimmunoassay, and pain at baseline, 2.6 and/or 5 years using the Western Ontario and McMaster University Osteoarthritis Index (WOMAC) questionnaire. We used linear regression with adjustment for age, sex, body mass index and season, then further adjusted for potential structural mechanisms (radiographic osteoarthritis, bone marrow lesions, chondral defects and muscle strength).

#### **RESULTS:**

Mean total knee WOMAC score was 3.2 (range 0-39). 4.2% of participants had moderate vitamin D deficiency at baseline (25-OHD 12.5-25 nmol/l). 25-OHD <25 nmol/l predicted change in knee pain (using total WOMAC score) over 5 years ( $\beta=2.41$ ,  $p=0.002$ ) with a similar effect size for hip pain over 2.4 years ( $\beta=2.20$ ,  $p=0.083$ ). Results were consistent within pain subscales, and the association was independent of demographic, anthropometric and structural covariates. No association was present when 25-OHD was analysed as a continuous measure.

#### **CONCLUSIONS:**

Moderate vitamin D deficiency independently predicts incident, or worsening of, knee pain over 5 years and, possibly, hip pain over 2.4 years. Therefore correcting moderate vitamin deficiency may attenuate worsening of knee or hip pain in elderly people but giving supplements to those with a higher 25-OHD level is unlikely to be effective.

PMID:23595144

Pain/Pleasure/orgasm

[J Sex Med.](#) 2013 Apr 3. doi: 10.1111/jsm.12144. [Epub ahead of print]

**Pleasure and Pain: The Effect of (Almost) Having an Orgasm on Genital and Nongenital Sensitivity.**

[Paterson LQ](#), [Amsel R](#), [Binik YM](#).

**Source**

Department of Psychology, McGill University, Montréal, Québec, Canada.

**Abstract**

**INTRODUCTION:**

The effect of sexual arousal and orgasm on genital sensitivity has received little research attention, and no study has assessed sensation pleasurable as well as painfulness.

**AIM:**

To clarify the relationship between sexual arousal, orgasm, and sensitivity in a healthy female sample.

**METHODS:**

Twenty-six women privately masturbated to orgasm and almost to orgasm at two separate sessions, during which standardized pressure stimulation was applied to the glans clitoris, vulvar vestibule, and volar forearm at three testing times: (i) baseline; (ii) immediately following masturbation; and (iii) following a subsequent 15-minute rest period.

**MAIN OUTCOME MEASURES:**

Touch thresholds (tactile detection sensitivity), sensation pleasurable ratings (pleasurable sensitivity), and pain thresholds (pain sensitivity).

**RESULTS:**

Pleasurable ratings were higher on the glans clitoris than the vulvar vestibule, and at most testing times on the vulvar vestibule than the volar forearm; and at baseline and immediately after masturbation than 15 minutes later, mainly on the genital locations only. Pain thresholds were lower on the genital locations than the volar forearm, and immediately and 15 minutes after masturbation than at baseline. After orgasm, genital pleasurable ratings and vulvar vestibular pain thresholds were lower than after masturbation almost to orgasm. Post-masturbation pleasurable ratings were positively correlated with pain thresholds but only on the glans clitoris. Hormonal contraception users had lower pleasurable ratings and pain thresholds on all locations than nonusers. There were no significant effects for touch thresholds.

**CONCLUSIONS:**

Masturbation appears to maintain pleasurable genital sensitivity but increase pain sensitivity, with lower genital pleasurable sensitivity and higher vulvar vestibular pain sensitivity when orgasm occurs. Findings suggest that enhancing stimulation pleasurable, psychological sexual arousal and lubrication mitigate normative increases in pain sensitivity during sexual activity, and underscore the importance of measuring both pleasure and pain in sensation research.

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PMID:23551826

## Pain disability Index/MS pain

[Spine \(Phila Pa 1976\)](#). 2013 Feb 5. [Epub ahead of print]

### **Extensive Validation of the Pain Disability Index in Three Groups of Patients With Musculoskeletal Pain.**

[Soer R](#), [Koke AJ](#), [Vroomen PC](#), [Stegeman P](#), [Smeets RJ](#), [Coppes MH](#), [Reneman MF](#).

#### **Source**

1Groningen Spine Center, University Medical Center Groningen, University of Groningen, the Netherlands. 2Center for Rehabilitation; University Medical Center Groningen, University of Groningen, the Netherlands. 3Department of Rehabilitation Medicine; research School of CAPHRI, Maastricht University, The Netherlands. 4Department of Neurology; University Medical Center Groningen, University of Groningen, the Netherlands. 5Adelante Centre of Expertise in Rehabilitation, Hoensbroek, The Netherlands. 6Department of Neurosurgery; University Medical Center Groningen, University of Groningen, the Netherlands. 7Department of Rehabilitation Medicine; University Medical Center Groningen, University of Groningen, the Netherlands.

#### **Abstract**

**ABSTRACT:** Study Design. A cross sectional study design was performed.

**Objective.** to extensively validate the Pain Disability Index (PDI) in three groups of patients with musculoskeletal pain.

**Summary of Background Data.** The PDI is a widely used and studied instrument for disability related to various pain syndromes, although there is conflicting evidence concerning factor structure, test retest reliability and missing items. Additionally, an official translation for the Dutch Language Version (DLV) has never been performed.

**Methods.** For reliability, internal consistency, factor structure, test-retest reliability and measurement error were calculated. Validity was tested with hypothesized correlations with pain intensity, kinesiophobia, Rand 36 subscales, depression, Roland Morris Disability Questionnaire, quality of life and work status. Structural validity was tested with independent backward translation and approval from the original authors.

**Results.** 178 Patients with acute back pain, 425 patients with chronic low back pain and 365 with widespread pain were included. Internal consistency of the PDI was good. 1 Factor was identified with Factor analyses. Test retest reliability was good for the PDI (Intra Class Correlation coefficient = 0.76). Stand Error of Measurement was 6.5 points and Smallest Detectable Change was 17.9 points. Little correlations between the PDI were observed with kinesiophobia and depression, fair correlations with pain intensity, work status, and vitality and moderate correlations with the Rand-36 subscales and the RMDQ.

**Conclusion.** the PDI-DLV is internally consistent as a one factor structure, and test-retest reliable. Missing items appear high in sexual and professional items. Using the PDI as a two factor questionnaire has no additional value and is unreliable.

PMID:23388675

## Vit D/LBP

### **Relationship Between Vitamin D Deficiency and Chronic Low Back Pain in Postmenopausal Women**

**Current Rheumatology Reviews, 04/23/2013 Review Article**

Rkain H et al. –

The study aims to examine whether vitamin D deficiency is a determinant risk factor of chronic low back pain (LBP) in Moroccan postmenopausal women.

The study shows a significant association between vitamin D deficiency and chronic LBP in Moroccan postmenopausal women. Further studies are clearly warranted to determine the effectiveness and the mechanism(s) of this links between vitamin D deficiency and chronic LBP.

#### **Methods**

- A biochemical assay of serum calcium, phosphate, 25(OH)D, and parathormone (PTH) was performed for 105 patients complaining from a chronic LBP with no obvious causes and compared to those of 45 healthy patients.
- All participants were postmenopausal.
- Patients were matched with controls for age and body mass index (BMI).
- Vitamin D deficiency was defined as a circulating level of 25(OH)D below 20 ng/ml.

#### **Results**

- Vitamin D deficiency was significantly more common in patients suffering from chronic LBP than in controls (79 % vs 61.4 %; P= 0.02).
- Falls antecedent was also associated with chronic LBP (37.1 % in patients vs 20.5% in controls; P< 0.01).
- There was no significant association between chronic LBP and age, BMI, smoking status, nor with number of pregnancies.
- In multiple logistic regression, after adjusting for potential confounders factors potentially influencing chronic LBP (age, BMI, smoking status, number of pregnancies), the main determinants of chronic LBP were vitamin D deficiency [OR 2.5 (95% IC, 1.1-5.8; P = 0.04)] and falls antecedent [OR 3 (95% IC, 1.2-7.2; P = 0.01)].

## C spine/Exercise

[Phys Ther.](#) 2013 Apr 11. [Epub ahead of print]

### **Effect of Therapeutic Exercise on Pain and Disability in the Management of Chronic Nonspecific Neck Pain: Systematic Review and Meta-Analysis of Randomized Trials.**

[Bertozzi L](#), [Gardenghi I](#), [Turoni F](#), [Villafañe JH](#), [Capra F](#), [Guccione AA](#), [Pillastrini P](#).

#### **Source**

L. Bertozzi, PT, Alma Mater Studiorum, University of Bologna, Bologna, Italy.

#### **Abstract**

##### **BACKGROUND:**

Given the prevalence of chronic non-specific neck pain (CNSNP) internationally, attention has increasingly been paid in recent years to evaluate the efficacy of therapeutic exercise (TE) with this condition.

##### **PURPOSE:**

The purpose of this study was to conduct a current review of RCTs concerning the effect of TE on pain and disability among people with CNSNP, perform a meta-analysis, and summarize current understanding.

##### **DATA SOURCES:**

Data were obtained from MEDLINE, CINAHL, EMBASE, PEDro, and CENTRAL databases from their inception to August 2012. Reference lists of relevant literature reviews were also tracked.

##### **STUDY SELECTION:**

All published randomized trials without any restriction regarding time of publication or language were considered for inclusion. Study subjects had to be symptomatic adults with only CNSNP.

##### **DATA EXTRACTION:**

Two reviewers independently selected the studies, conducted the quality assessment, and extracted the results. Data were pooled in a meta-analysis using a random-effects model.

##### **DATA SYNTHESIS:**

Seven studies met inclusion criteria. TE proved to have medium significant short and intermediate term effects on pain ( $g=-0,53$ , 95% CI -0,86 to -0,20, and  $g=-0,45$ , 95% CI -0,82 to -0,07 respectively) and medium but not significant short and intermediate term effects on disability ( $g=-0,39$ , 95%CI -0,86 to 0,07, and  $g=-0,46$ , 95% CI -1,00 to -0,08).

##### **LIMITATIONS:**

Only one study investigated the effect of TE on pain and disability at follow-up longer than 6 months after intervention.

##### **CONCLUSIONS:**

Consistent with other reviews, the results support the use of TE in the management of CNSNP. In particular, a significant overall effect size was found supporting TE for its effect on pain in both the short and intermediate terms.

PMID:23559524

## Discogenic pain

[Pain Med.](#) 2013 Apr 8. doi: 10.1111/pme.12082. [Epub ahead of print]

### **Lumbar Discogenic Pain: State-of-the-Art Review.**

[Bogduk N](#), [Aprill C](#), [Derby R](#).

#### **Source**

University of Newcastle, Newcastle Bone and Joint Institute, Royal Newcastle Centre, Newcastle, New South Wales, Australia.

#### **Abstract**

##### **OBJECTIVE:**

To test the null hypotheses that: lumbar intervertebral discs cannot be a source of pain; discs are not a source of pain; painful lumbar discs cannot be diagnosed; and there is no pathology that causes discogenic pain.

##### **METHODS:**

Philosophical essay and discourse with reference to the literature.

##### **RESULTS:**

Anatomic and physiologic evidence denies the proposition that disc cannot be a source of pain. In patients with back pain, discs can be source of pain. No studies have refuted the ability of disc stimulation to diagnose discogenic pain. Studies warn only that disc stimulation may have a false-positive rate of 10% or less. Internal disc disruption is the leading cause of discogenic pain. Discogenic pain correlates with altered morphology on computerized tomography scan, with changes on magnetic resonance imaging, and with internal biophysical features of the disc. The morphological and biophysical features of discogenic pain have been produced in biomechanics studies and in laboratory animals.

##### **CONCLUSIONS:**

All of the null hypotheses that have been raised against the concept of discogenic pain and its diagnosis have each been refuted by one or more studies. Although studies have raised concerns, none has sustained any null hypothesis. Discogenic pain can occur and can be diagnosed if strict operational criteria are used to reduce the likelihood of false-positive results.

Wiley Periodicals, Inc.

PMID:23566298

## Chronic pain

[J Pain](#). 2013 Apr 8. pii: S1526-5900(13)00462-8. doi: 10.1016/j.jpain.2013.01.425. [Epub ahead of print]

### **Assessing Chronic Pain Treatment Practices and Evaluating Adherence to Chronic Pain Clinical Guidelines in Outpatient Practices in the United States.**

[Rasu RS](#), [Sohraby R](#), [Cunningham L](#), [Knell ME](#).

#### **Source**

Associate Professor, Division of Pharmacy Practice and Administration, University of Missouri-Kansas City School of Pharmacy, Kansas City, Missouri.

#### **Abstract**

Chronic pain is a major health concern in the United States. Several guidelines have been developed for clinicians to promote effective management and provide an analytical framework for evaluation of treatments for chronic pain.

This study explores sample population demographics and the utilization of various therapeutic modalities used in an adult population with common nonmalignant chronic pain (NMCP) indications in U.S. outpatient settings. A cross-sectional study using the National Ambulatory Medical Care Survey (NAMCS) data from 2000 to 2007 was used to analyze various treatment practices for the management of NMCP and evaluate the results in comparison with guidelines.

The study population of 690,205,290 comprised 63% females, with 45.17% of patient visits occurring in primary care settings. Treatment with at least 1 chronic pain medication was reported in 99.7% of patients. Nonsteroidal anti-inflammatory agents were the most common treatment prescribed, with use reported in approximately 95% of the patient visits. No other pain medication drug class or nonmedication therapy was prescribed more than 26.4%. These results point to a potential underutilization of many recommended NMCP treatments including combination therapies and the need for enhanced education of chronic pain guidelines.

**PERSPECTIVE:** This study, representing over 690 million patient visits, contributes to the relative paucity of data on the use of therapeutic modalities in the management of NMCP. These results may assist clinicians and healthcare policymakers in identifying areas where practices are at odds with guidelines with the goal to improve care.

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PMID:23578958

## Shoulder pain/Assessment/Volleyball

Med Sci Sports Exerc. 2013 Apr 10. [Epub ahead of print]

### **Shoulder Pain among High-Level Volleyball Players and Preseason Features.**

Forthomme B, Wieczorek V, Frisch A, Crielaard JM, Croisier JL.

#### **Source**

1Department of Sport and Rehabilitation Sciences, University and University Hospital Centre of Liege, Belgium 2Regional Hospital Centre of Lille, France 3 Sports Medicine Research Laboratory, Public Research Centre for Health and Sports Clinic of the Hospital Centre of Luxembourg, Luxembourg.

#### **Abstract**

**Purpose:** The main goal of this prospective study was to identify the most significant intrinsic risk factors for shoulder pain by measuring strength developed by shoulder rotators and by carrying out various morphostatic assessments.

**Methods:** Sixty-six players ( $24 \pm 5$  years) were recruited from 9 volleyball teams from the first and second divisions (34 men and 32 women) to participate in the study. Before the start of the volleyball season, all the participants completed a preseason questionnaire and underwent both a bilateral isokinetic evaluation of the shoulders and morphostatic measurements. During the subsequent 6 months of the competition period, the players reported through a weekly questionnaire any shoulder pain experienced.

**Results:** During the on-going season, 23% (15 players out of 66) of the volleyball players suffered from dominant shoulder pain. Interestingly, participants who reported a history of dominant shoulder pain were found to have a 9 times higher risk of suffering further pain in their dominant shoulder. The eccentric maximal strength developed by the internal and external rotators was found to represent a protective factor in the volleyball players (respective odds ratios = 0.946 -  $p = 0.01$  and 0.94 -  $p = 0.05$ ). No risk factors were found among the shoulder morphostatic measurements.

**Conclusion:** In our study, the evaluation of shoulder rotator muscle strength through isokinetic assessment, especially eccentric mode, appeared to be the most contributing parameter to identify risk factors for shoulder pain. This evaluation should allow to better identify players at risk.

PMID:23575514

## Regional pain syndrome/motor/muscle hyperalgesia

[J Pain](#). 2013 Mar 27. pii: S1526-5900(12)00969-8. doi: 10.1016/j.jpain.2012.12.009. [Epub ahead of print]

### **Muscle Hyperalgesia Correlates With Motor Function in Complex Regional Pain Syndrome Type 1.**

[van Rooijen DE](#), [Marinus J](#), [Schouten AC](#), [Noldus LP](#), [van Hilten JJ](#).

#### **Source**

Department of Neurology, Leiden University Medical Center, Leiden, The Netherlands.

#### **Abstract**

At present it is unclear if disturbed sensory processing plays a role in the development of the commonly observed motor impairments in patients with complex regional pain syndrome (CRPS).

This study aims to investigate the relation between sensory and motor functioning in CRPS patients with and without dystonia. Patients with CRPS of the arm and controls underwent comprehensive quantitative sensory testing and kinematic analysis of repetitive finger movements. Both CRPS groups showed thermal hypoesthesia to cold and warm stimuli and hyperalgesia to cold stimuli. A decreased pressure pain threshold reflecting muscle hyperalgesia emerged as the most prominent sensory abnormality in both patient groups and was most pronounced in CRPS patients with dystonia. Moreover, the decreased pressure pain threshold was the only nociceptive parameter that related to measures of motor function in both patients and controls. CRPS patients with dystonia had an increased 2-point discrimination as compared to controls and CRPS patients without dystonia.

This finding was also reported in other types of dystonia and has been associated to cortical reorganization in response to impaired motor function. We hypothesize that increased sensitivity of the circuitry mediating muscle nociception may play a crucial role in impaired motor control in CRPS.

**PERSPECTIVE:** This is the first study linking a sensory dysfunction, ie, muscle hyperalgesia, to motor impairment in CRPS. Circuitries mediating muscle nociception may therefore play an important role in impaired motor control in CRPS.

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PMID:23541068

LBP/Leisure activity

[BMC Public Health](#). 2013 Apr 25;13(1):385. [Epub ahead of print]

**The influence of self-reported leisure time physical activity and the body mass index on recovery from persistent back pain among men and women: a population-based cohort study.**

[Bohman T](#), [Alfredsson L](#), [Hallqvist J](#), [Vingård E](#), [Skillgate E](#).

**Abstract**

**BACKGROUND:**

There is limited knowledge about leisure time physical activity and the body mass index (BMI) as prognostic factors for recovery from persistent back pain. The aim of this study was to assess the sex specific influence of leisure time physical activity and BMI on recovery from persistent back pain in a general population.

**METHODS:**

The study population (n=1836) in this longitudinal cohort study consisted of participants reporting persistent back pain in the baseline questionnaire in 2002-2003. Data on leisure time physical activity, BMI and potential confounders were also collected at baseline. Information on recovery from persistent back pain (no back pain periods  $\geq$  7 days during the last 5 years) was obtained from the follow-up questionnaire in 2007. Log-binomial models were applied to calculate Risk Ratios with 95 percent Confidence Intervals (CI) comparing physically active and normal weight groups versus sedentary and overweight groups.

**RESULTS:**

Compared to a sedentary leisure time, all measured levels of leisure time physical activity were associated with a greater chance of recovery from persistent back pain among women. The adjusted Risk Ratios was 1.46 (95% CI: 1.06, 2.01) for low leisure time physical activity, 1.51 (95% CI: 1.02, 2.23) for moderate leisure time physical activity, and 1.67 (95% CI: 1.08, 2.58) for high leisure time physical activity. There were no indications that leisure time physical activity influenced recovery among men, or that BMI was associated with recovery from persistent back pain either among men or among women.

**CONCLUSIONS:**

Regular leisure time physical activity seems to improve recovery from persistent back pain among women.

PMID: 23617707

## Migraine/Youth/white matter

[Cephalalgia](#). 2013 Apr 10. [Epub ahead of print]

### **MRI white matter lesions in pediatric migraine.**

[Eidlitz-Markus T](#), [Zeharia A](#), [Haimi-Cohen Y](#), [Konen O](#).

#### **Source**

Pediatric Headache Clinic, Ambulatory Day Care Hospitalization Unit, Schneider Children's Medical Center of Israel, Israel.

#### **Abstract**

##### **OBJECTIVES:**

Studies have reported an association between migraine and white matter hyperintensities on T2-weighted brain magnetic resonance imaging (MRI) in adults. The aim of the present study was to evaluate white matter MRI brain findings in pediatric patients with migraine.

##### **METHODS:**

The medical files and imaging scans of all 194 patients who underwent brain MRI at the headache clinic of a tertiary medical center in 2008-2011 were reviewed.

##### **RESULTS:**

Mean age was  $10.9 \pm 3.5$  years. Migraine was diagnosed in 131 patients and other disorders in 63. In the migraine group, findings on physical and laboratory examinations were within normal range. White matter lesions were identified on MRI scan in 14 children with migraine (10.6%) and none of the children with other disorders (  $P = 0.006$ ). In 13/14 patients, the lesions were focal with a variable distribution; in the remaining patient, confluent periventricular hyperintensities were documented.

##### **CONCLUSIONS:**

In a headache clinic of a tertiary pediatric medical center, white matter lesions are found in about 10% of pediatric patients with migraine.

PMID: 23575818

## Headache/impaired motor learning

[Cephalalgia](#). 2013 Apr 18. [Epub ahead of print]

**Chronic tension-type headache is associated with impaired motor learning.**

[Vallence AM](#), [Smith A](#), [Tabor A](#), [Rolan PE](#), [Ridding MC](#).

### Source

The Robinson Institute, School of Paediatrics and Reproductive Health, University of Adelaide, Australia.

### Abstract

#### **BACKGROUND:**

Supraspinal activity-dependent neuroplasticity may be important in the transition from acute to chronic pain. We examined neuroplasticity in a cortical region not considered to be a primary component of the central pain matrix in chronic tension-type headache (CTTH) patients. We hypothesised that neuroplasticity would be exaggerated in CTTH patients compared to healthy controls, which might explain (in part) the development of chronic pain in these individuals.

#### **METHODS:**

Neuroplasticity was examined following a ballistic motor training task in CTTH patients and control subjects (CS). Changes in peak acceleration (motor learning) and motor-evoked potential (MEP) amplitude evoked by single-pulse transcranial magnetic stimulation were compared.

#### **RESULTS:**

CTTH patients showed significantly less motor learning on the training task than CS (mean acceleration increase 87% CTTH, 204% CS,  $P < .05$ ), and CS but not CTTH patients showed a significant increased MEP amplitude following training (CS:  $F = 2.9$ ,  $P < .05$ ; CTTH:  $F = 1.6$ ,  $P > .05$ ).

#### **CONCLUSIONS:**

These findings suggest a deficit in use-dependent neuroplasticity within networks responsible for task performance in CTTH patients which might reflect reciprocal influences between primary motor cortex and interconnected pain processing networks. These findings may help explain the positive effects of facilitatory non-invasive brain stimulation targeting motor areas on chronic pain and help elucidate the mechanisms mediating chronic pain.

PMID:23598373

## Pain/subcutaneous fat

[Eur J Pain](#). 2013 Apr 11. doi: 10.1002/j.1532-2149.2013.00315.x. [Epub ahead of print]

### **The role of excess subcutaneous fat in pain and sensory sensitivity in obesity.**

[Price RC](#), [Asenjo JF](#), [Christou NV](#), [Backman SB](#), [Schweinhardt P](#).

#### **Source**

Faculty of Medicine, McGill University, Montreal, Canada; The Alan Edwards Center for Research on Pain, McGill University, Montreal, Canada.

#### **Abstract**

##### **BACKGROUND:**

Previous studies suggest pain sensitivity may be decreased in obesity, but it is unknown whether this is a global or a site-specific phenomenon related to the amount of excess fat.

##### **METHODS:**

Design: a cross-sectional study comparing obese and non-obese participants on body sites with much and little excess subcutaneous fat in obesity. Hot and cold sensory detection thresholds, pain thresholds, pain tolerance and subjective ratings for a cold (0 °C) and hot (48 °C) stimulus were assessed using a 16 × 16 mm thermode (Medoc, Israel) on the forehead and abdomen. Pressure pain thresholds were measured on the hand. Cold water immersion tolerance duration and subjective ratings were assessed on the hand. Two indices of central pain processing, i.e., temporal summation and heterotopic noxious stimulation, were assessed.

##### **RESULTS:**

A total of 20 obese participants [10M/10F, BMI mean (SD) = 41.5 kg/m<sup>2</sup> (9.4 kg/m<sup>2</sup>)] and 20 age- and gender-matched non-obese controls [10M/10F, BMI mean (SD) = 23.5 kg/m<sup>2</sup> (2.9 kg/m<sup>2</sup>)] were studied. Compared with non-obese, obese participants had higher thresholds and lower subjective ratings, indexing decreased sensitivity, for painful and non-painful thermal stimuli on the abdomen, an area with much excess subcutaneous fat. Decreases in abdominal sensitivity correlated with measures of adiposity (i.e., waist-to-hip ratio and subcutaneous fat thickness). On areas with little excess subcutaneous fat (forehead and hand), obese and non-obese groups did not differ in measures of thermal or pressure sensitivity, nor for indices of central pain processing.

##### **CONCLUSION:**

Obese participants are less sensitive than non-obese individuals, but only on areas with excess subcutaneous fat.

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PMID:23576531

## Pain/Central responses

[JAMA Psychiatry](#). 2013 Apr 24;1-8. doi: 10.1001/jamapsychiatry.2013.27. [Epub ahead of print]

### **Brain Response to Empathy-Eliciting Scenarios Involving Pain in Incarcerated Individuals With Psychopathy.**

[Decety J](#), [Skelly LR](#), [Kiehl KA](#).

#### **Abstract**

**IMPORTANCE** A marked lack of empathy is a hallmark characteristic of individuals with psychopathy. However, neural processes associated with empathic processing have not yet been directly examined in psychopathy, especially in response to the perception of other people in pain and distress.

**OBJECTIVE** To identify potential differences in patterns of neural activity in incarcerated individuals with psychopathy and incarcerated persons serving as controls during the perception of empathy-eliciting stimuli depicting other people experiencing pain.

**DESIGN** In a case-control study, brain activation patterns elicited by dynamic stimuli depicting individuals being harmed and facial expressions of pain were compared between incarcerated individuals with psychopathy and incarcerated controls.

**SETTING** Participants were scanned on the grounds of a correctional facility using the Mind Research Network's mobile 1.5-T magnetic resonance imaging system.

**PARTICIPANTS** Eighty incarcerated men were classified according to scores on the Hare Psychopathy Checklist-Revised (PCL-R) as high (27 men; PCL-R,  $\geq 30$ ), intermediate (28 men; PCL-R, 21-29), or low (25 men; PCL-R,  $\leq 20$ ) levels of psychopathy.

**MAIN OUTCOME MEASURE** Neurohemodynamic response to empathy-eliciting dynamic scenarios revealed by functional magnetic resonance imaging.

**RESULTS** Participants in the psychopathy group exhibited significantly less activation in the ventromedial prefrontal cortex, lateral orbitofrontal cortex, and periaqueductal gray relative to controls but showed greater activation in the insula, which was positively correlated with scores on both PCL-R factors 1 and 2.

**CONCLUSIONS AND RELEVANCE** In response to pain and distress cues expressed by others, individuals with psychopathy exhibit deficits in the ventromedial prefrontal cortex and orbitofrontal cortex regardless of stimulus type and display selective impairment in processing facial cues of distress in regions associated with cognitive mentalizing. A better understanding of the neural responses to empathy-eliciting stimuli in psychopathy is necessary to inform intervention programs.

PMID: 23615636

## Yoga/LBP

### **The Efficacy of Yoga as an Intervention for Chronic Low Back Pain: A Systematic Review of Randomized Controlled Trials**

**American Journal of Lifestyle Medicine, 04/17/2013 Evidence Based Medicine Review**

#### **Article Clinical Article**

Diaz AM et al. –

The purpose of this study was to systematically review the current literature for randomized controlled trials that assess the outcomes of Yoga as an intervention for individuals with chronic low back pain (cLBP). Yoga was demonstrated to significantly improve quality of life and reduce disability, stress, depression, and medication usage associated with cLBP in 8 of the 10 analyzed trials when compared with usual care, self-care book, or exercises. However, more research is necessary before recommendations can be made.

#### **Methods**

- An electronic database search was performed for studies related to the efficacy of yoga in treatment for cLBP.
- Studies included were randomized control trials, published in English, from a peer-reviewed journal that identified yoga as the primary treatment focus for LBP in at least one group and included participants with at least a 12-week (3-month) history of symptoms.

#### **Results**

- The search revealed 185 articles. Of these, 10 met the inclusion criteria.
- The authors concluded Yoga intervention appears to be an efficacious intervention in alleviating cLBP.

## Migraine/cortical

[Cephalalgia](#). 2013 Apr 10. [Epub ahead of print]

### **Different levels of cortical excitability reflect clinical fluctuations in migraine.**

[Restuccia D](#), [Vollono C](#), [Del Piero I](#), [Martucci L](#), [Zanini S](#).

#### **Source**

Department of Neurosciences, Catholic University, Italy.

#### **Abstract**

##### **BACKGROUND:**

In a previous study we demonstrated that high-frequency oscillations (HFOs) elicited by median nerve stimulation are significantly correlated to clinical fluctuations of migraine. We aimed at verifying whether clinical fluctuations and HFO changes are correlated to N20 somatosensory evoked potential (SEP) recovery cycle, which is likely to reflect the functional refractoriness of primary somatosensory cortex neurons.

##### **METHODS:**

We analysed both HFOs and N20 SEP recovery cycle to paired stimulation in 21 migraine patients and 18 healthy volunteers.

##### **RESULTS:**

Shortened recovery cycle correlated with low-amplitude HFOs as well as with clinical worsening. By contrast, prolonged recovery cycle correlated with enhanced HFOs, as well as with spontaneous clinical improvement.

##### **CONCLUSIONS:**

In our migraine patients the strict relationship between presynaptic HFO amplitude and N20 recovery function suggests that changes of both parameters might be caused by modifications of the thalamo-cortical drive. Our findings suggest that the thalamo-cortical drive during interictal stages could fluctuate from abnormally high to abnormally low levels, depending on mechanisms which reduce cortical excitability in spontaneously improving patients, and increase cortical excitability in spontaneously worsening ones.

PMID:23575822

**Breathing/relaxation/pain control/burn patients**

Burns. 2013 Jan 31. pii: S0305-4179(13)00009-0. doi: 10.1016/j.burns.2013.01.006. [Epub ahead of print]

**The effects of relaxation breathing on procedural pain and anxiety during burn care.**

Park E, Oh H, Kim T.

**Source**

Bestian Burn Center, Daejeon, South Korea.

**Abstract**

**INTRODUCTION:**

Burn patients experience high levels of pain and anxiety during dressing changes. Relaxation breathing is a simple behavioral intervention to manage pain and anxiety. However, the information about the effects of relaxation breathing on pain and anxiety levels for burn patients during dressing changes is limited.

**METHODS:**

This study followed a quasi-experimental, pretest-posttest comparison group design without random assignment to groups. A total of 64 burn patients from Daejeon, South Korea were recruited by a convenience sequential sampling approach. With institutional approval and written consent, the experimental group practiced relaxation breathing during dressing change procedures. Data were collected from June to September 2011 using a VAS for pain and a VAS-A for anxiety.

**RESULTS:**

The homogeneity test was used to detect any significant group differences in the demographic data and pretest measures. The pain scores significantly differed between the 2 groups after intervention (RB group vs. control group,  $P=.01$ ) and over time (pretest vs. posttest,  $P=.001$ ). The anxiety scores significantly differed between the 2 groups ( $P=.01$ ) and over time ( $P=.02$ ).

**CONCLUSION:**

Relaxation breathing is a simple and inexpensive technique nurses can use to help burn patients manage pain and anxiety during dressing changes.

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PMID:23375536

**Effectiveness of Mindfulness-Based Cognitive Therapy in the Treatment of Fibromyalgia: A Randomised Trial**

**Cognitive Therapy and Research, 04/11/2013 Clinical Article**

Parra-Delgado M et al. –

The aim of this study is to demonstrate the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) in reducing the impact of fibromyalgia, the depressive symptoms and the intensity of pain in women with fibromyalgia. The study findings suggest that depressive symptoms and the impact of the illness were reduced in the MBCT group of women diagnosed with fibromyalgia. These changes were maintained during the 3-month follow up. No significant changes were found in the reduction of intensity of pain. The limitations of this study were analysed and possible improvements for future research were considered.

**Methods**

- An experimental pre-post treatment design with a 3-month follow-up was carried out.
- Female patients (N = 33) were randomised to MBCT or to a control group condition.
- MBCT is an 8-week group intervention.
- Measures included: Fibromyalgia Impact Questionnaire, Beck Depression Inventory and Visual Analogue Scale.

**Results**

- Substantial differences were found in the reduction of the impact of fibromyalgia after treatment and in the decrease in depressive symptoms decrease in the follow-up.
- A slight decrease was observed in intensity of pain in different body areas although there were no significant differences between the groups.

## Migrane's/Steroids

[Eur J Neurol](#). 2013 Apr 11. doi: 10.1111/ene.12155. [Epub ahead of print]

**Steroids for preventing recurrence of acute severe migraine headaches: a meta-analysis.**

[Huang Y](#), [Cai X](#), [Song X](#), [Tang H](#), [Huang Y](#), [Xie S](#), [Hu Y](#).

### Source

Clinical Medicine Research Institute, First People's Hospital of Shunde (the Affiliated Hospital at Shunde, Southern Medical University), Foshan, China.

### Abstract

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

Recurrence of migraine headaches after treatment is common. The evidence regarding steroids for preventing migraine headache recurrence is controversial. This meta-analysis examined the effectiveness of steroids for prevention of recurrent headaches.

#### **METHODS:**

Databases (PubMed, Embase and the Cochrane Library) and conference proceedings were searched for randomized controlled trials comparing steroids and placebo in the treatment of migraine headaches. Two independent reviewers assessed studies and extracted data. Relative risks (RRs) of headache recurrence and adverse events were calculated and reported with 95% confidence intervals (95% CIs).

#### **RESULTS:**

Eight studies with 905 patients were included. Pooled analysis showed that when steroids were added to standard abortive therapy they reduced the rate of moderate or severe headache recurrence after 24-72 h of follow-up evaluation (RR = 0.71; 95% CI = 0.59-0.86). There was no significant benefit of steroids compared with placebo in the proportion of totally resolved migraines (RR = 1.11; 95% CI = 0.94-1.32). The side effects of steroids are mild and not significant except for dizziness. Subgroup meta-analysis showed that parenteral dexamethasone tends to be more effective in reducing moderate or severe recurrent headaches (RR = 0.68; 95% CI = 0.55-0.84). However, no significant differences were found between oral administration and parenteral administration of steroids (P = 0.37).

#### **CONCLUSION:**

When steroids are added to standard abortive therapy for migraine headaches, they are effective and safe for preventing moderate or severe headache recurrence.

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PMID:23577697

## Migraine/ genetics

Headache Pain. 2013 Mar 26;14(1):28. doi: 10.1186/1129-2377-14-28.

### **Genetic variants in the NOTCH4 gene influence the clinical features of migraine.**

Rubino E, Fenoglio P, Gallone S, Govone F, Vacca A, De Martino P, Giobbe ML, Boschi S, Pinessi L, Gentile S, Rainero I.

#### **Source**

Neurology II, Department of Neuroscience, University of Torino, Via Cherasco 15, Torino, 10126, Italy. elisa.rubino@unito.it.

#### **Abstract**

##### **BACKGROUND:**

Recent studies suggested an important role for vascular factors in migraine etiopathogenesis. Notch4 belongs to a family of transmembrane receptors that play an important role in vascular development and maintenance. The aim of this study was to test the hypothesis that polymorphisms of the NOTCH4 gene would modify the occurrence and the clinical features of migraine.

##### **FINDINGS:**

Using a case-control strategy, we genotyped 239 migraine patients and 264 controls for three different non-synonymous polymorphisms (T320A, G835V, R1346P) of the NOTCH4 gene and for the (CTG) n-encoding poly-leucine polymorphism in exon 1. Although the analyzed polymorphisms resulted not associated with migraine, the clinical characteristics of our patients were significantly influenced by the different NOTCH4 genotypes. Longer duration of disease and severity of neurovegetative symptoms during headache attacks were associated with the R1346P and G835V polymorphisms, respectively. In female patients, worsening of migraine symptoms at menarche was significantly correlated with T320A polymorphism.

##### **CONCLUSIONS:**

Our study shows that genetic variations within the NOTCH4 gene significantly modify the clinical characteristics of migraine and may have a role in disease pathogenesis.

PMID:23566281

Fear/pain

[Scand J Caring Sci](#). 2013 Apr 12. doi: 10.1111/scs.12043. [Epub ahead of print]

**'I am afraid to make the damage worse' - fear of engaging in physical activity among patients with neck or back pain - a gender perspective.**

[Stenberg G](#), [Fjellman-Wiklund A](#), [Ahlgren C](#).

### Source

The National Graduate School of Gender Studies, Umeå University, Umeå, Sweden.

### Abstract

#### **RATIONALE:**

Neck and back pain are major public health problems in Western societies and cause considerable disability and health service use. Swedish women report more severe neck and back pain compared with Swedish men. Most studies on the aetiology of gender differences in pain deal with biological mechanisms, and less with the role of psychological and sociocultural factors. 'Pain beliefs' is a sociocultural factor and can be expressed in different ways among women and men. It is important to know what pain beliefs are held by neck and back pain patients, especially when medical guidelines recommend that back pain patients stay physically active.

#### **AIM:**

Exploring pain beliefs in relation to physical activity among neck and back pain patients consulting primary health care.

#### **METHOD:**

Twelve patients (seven women, five men) consulting primary health care for an initial episode of neck or back pain were interviewed before their first appointment with a physiotherapist or general practitioner and 3 months later. The interviews covered patient experiences of neck or back pain, consequences, strategies and treatment experiences. The interviews were analysed with qualitative content analysis from a gender perspective.

#### **RESULT:**

One theme 'Fear of hurting the fragile body' was expressed by all neck or back pain patients. Five categories were identified 'The mechanical body', 'Messages about activity', 'Earlier experiences of pain and activity', 'To be a good citizen' and 'Support to be active' supported or undermined beliefs about pain and physical activity. Gender expressions occurred in the categories 'Messages about activity', 'To be a good citizen' and 'Support to be active'.

#### **CONCLUSIONS:**

Neck or back pain patients in the study saw the body as fragile and were afraid of hurting it. Notions of gender had an impact on the given advice about activity and on how patients perceived the message about staying active.

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PMID:23578006

## LBP

Mod Rheumatol. 2013 Apr 10. [Epub ahead of print]

### **Prevalence of low back pain as the primary pain site and factors associated with low health-related quality of life in a large Japanese population: a pain-associated cross-sectional epidemiological survey.**

Yamada K, Matsudaira K, Takeshita K, Oka H, Hara N, Takagi Y.

#### **Source**

Department of Orthopaedic Surgery, Faculty of Medicine, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, 113-0033, Japan, forpatients2008@gmail.com.

#### **Abstract**

##### **OBJECTIVES:**

This study aimed to estimate the prevalence, magnitude, and direction of the associations among disability, pain intensity, number of pain sites, and health-related quality of life (HRQoL) in patients reporting low back pain (LBP) as their primary pain.

##### **METHODS:**

In January 2009, an Internet survey was performed for randomly selected adults aged 20-79 years who were registered as Internet research volunteers. Of 20 044 respondents, individuals with LBP as the primary pain were analyzed for associations among disability, number of pain sites, and HRQoL. Factors associated with low HRQoL were examined using multiple logistic regression modeling.

##### **RESULTS:**

Of the 20 044 respondents, 25.2 % (n = 5060) reported LBP and 13.5 % (n = 2696) reported LBP as their primary pain. Among those with LBP as the primary pain, HRQoL decreased with increase in disability and number of pain sites. In multivariate analyses, disability [adjusted odds ratio (aOR), 2.93-4.58], number of pain sites (aOR, 1.42-6.12), pain intensity  $\geq 7$  (aOR, 1.88), and age  $\geq 60$  years (aOR, 1.55) were associated with low HRQoL.

##### **CONCLUSIONS:**

Approximately 13.5 % of patients reported LBP as their primary pain. Disability with absence from social activity and  $\geq 7$  pain sites were strongly associated with low HRQoL.

PMID: 23572318

## Pain/Pain scale PQAS

Clin J Pain. 2013 May;29(5):400-10. doi: 10.1097/AJP.0b013e318260857d.

### **Cognitive testing and revision of the pain quality assessment scale.**

Jensen MP, Lin CP, Kupper AE, Galer BS, Gammaitoni AR.

#### **Source**

\*Department of Rehabilitation Medicine, University of Washington, Seattle, WA †Nuvo Research Inc., Pain Division, West Chester, PA.

#### **Abstract**

##### **OBJECTIVE:**

: To revise the Pain Quality Assessment Scale (PQAS) using feedback from patients to further increase its validity.

##### **METHODS:**

: This project involved 3 cognitive interviewing studies. In Study 1, a group of patients with chronic pain (N=20) were asked a series of questions regarding the PQAS's understandability, and invited to make suggestions regarding how the measure could be improved. In Study 2, a second group of patients (N=21) responded to questions about a modified version of the PQAS. The PQAS was further modified on the basis of the findings of Study 2, and in Study 3 the participants were asked to indicate whether the changes made improved the understandability of the PQAS further.

##### **RESULTS:**

: The participants in Studies 1 and 2 identified portions of the PQAS instructions and some of the PQAS items that could be modified to increase their understandability. Modifications resulted in a revised PQAS that was deemed by patients with chronic pain to be more understandable than the original PQAS by the majority of participants.

##### **DISCUSSION:**

: Cognitive testing can be used to improve the understandability of pain measures. The results of cognitive testing with the PQAS indicated that much of the content of the original instructions and items were understandable as written, but that minor changes could be made to make them even clearer to patients with chronic pain. The changes made resulted in a revised PQAS that is more understandable and may therefore be even more useful than with the original PQAS.

PMID: 23247001

## Central sensitization/scalp pain

Clin J Pain. 2013 May;29(5):417-24. doi: 10.1097/AJP.0b013e31825e4437.

### **Indications for peripheral and central sensitization in patients with chronic scalp pain (trichodynia).**

Defrin R, Lurie R.

#### **Source**

\*Department Physical Therapy, Sackler Faculty of Medicine, Tel-Aviv University, Tel-Aviv  
†Pediatric Dermatology Unit, Schneider Children's Medical Center, Petah Tiqva, Israel.

#### **Abstract**

##### **OBJECTIVES:**

: The underlying mechanism of trichodynia (scalp/hair pain, is unknown). The aim of this study was to characterize chronic trichodynia and to conduct, for the first time, sensory testing in patients with trichodynia to learn about possible underlying mechanisms.

##### **METHODS:**

: Participants were 16 trichodynia patients and 19 healthy controls. Participants underwent testing of touch and pressure-pain threshold as well as allodynia in painful and pain-free scalp sites and in the hands (intact remote region). A trichogram (hair test) was conducted on painful and pain-free scalp sites to evaluate hair cycle abnormalities. The chronic pain was characterized as well.

##### **RESULTS:**

: Painful sites were characterized by decreased thresholds for light touch ( $P<0.01$ ) and pressure pain ( $P<0.01$ ) and high rates of static allodynia (94%) compared with adjacent pain-free sites and controls. A significant negative correlation was found between chronic pain intensity and scalp thresholds. Spontaneous and evoked pain existed only in scalp sites with hair cycle abnormalities. In addition, pressure-pain threshold in the hands was significantly lower in trichodynia patients compared with controls.

##### **DISCUSSION:**

: The cranial hyperalgesia and allodynia, the generalized hyperalgesia, and the correlation between hyperalgesia and chronic pain suggest that trichodynia is related with both peripheral and central sensitization, respectively. The coexistence of hair cycle abnormalities and chronic pain might suggest a common denominator for both phenomena, possibly mediated by proinflammatory agents. Clinical implications are discussed.

PMID: 23246999

## Pain/Placebo

### Hypnotic susceptibility modulates brain activity related to experimental placebo analgesia

Pain, 04/12/2013 **Clinical Article**

• [Alexa Huber](#) , [Fausta Lui](#), [Carlo Adolfo Porro](#)

#### Summary

The cognitive trait of hypnotic susceptibility correlates with interindividual differences in functional magnetic resonance imaging brain patterns of activity in conditioned placebo analgesia.

#### Abstract

Identifying personality traits and neural signatures that predict placebo responsiveness is important, both on theoretical and practical grounds. In the present functional magnetic resonance imaging (fMRI) study, we performed multiple-regression interaction analysis to investigate whether hypnotic susceptibility (HS), a cognitive trait referring to the responsiveness to suggestions, explains interindividual differences in the neural mechanisms related to conditioned placebo analgesia in healthy volunteers. HS was not related to the overall strength of placebo analgesia. However, we found several HS-related differences in the patterns of fMRI activity and seed-based functional connectivity that accompanied placebo analgesia. Specifically, in subjects with higher HS, the placebo response was related to increased anticipatory activity in a right dorsolateral prefrontal cortex focus, and to reduced functional connectivity of that focus with brain regions related to emotional and evaluative pain processing (anterior mid-cingulate cortex/medial prefrontal cortex); an opposite pattern of fMRI activity and functional connectivity was found in subjects with lower HS. During pain perception, activity in the regions reflecting attention/arousal (bilateral anterior thalamus/left caudate) and self-related processing (left precuneus and bilateral posterior temporal foci) was *negatively* related to the strength of the analgesic placebo response in subjects with higher HS, but not in subjects with lower HS. These findings highlight HS influences on brain circuits related to the placebo analgesic effects. More generally, they demonstrate that different neural mechanisms can be involved in placebo responsiveness, depending on individual cognitive traits.

## Chronic pain/Active pacing

Clin J Pain. 2013 May;29(5):461-8. doi: 10.1097/AJP.0b013e3182608561.

### **Activity pacing in chronic pain: concepts, evidence, and future directions.**

Nielson WR, Jensen MP, Karsdorp PA, Vlaeyen JW.

#### **Source**

\*St Joseph's Health Care London, Lawson Research Institute, London, ON, Canada †Department of Physical Medicine and Rehabilitation, University of Washington, Seattle, WA ‡Department Clinical Psychological Science, Research Group Behavioural Medicine, Maastricht University, Maastricht, The Netherlands §Department of Psychology, Research Group Health Psychology, University of Leuven, Leuven, Belgium.

#### **Abstract**

##### **BACKGROUND:**

: Activity pacing (AP) is a concept that is central to many chronic pain theories and treatments, yet there remains confusion regarding its definition and effects.

##### **OBJECTIVE:**

: To review the current knowledge concerning AP and integrate this knowledge in a manner that allows for a clear definition and useful directions for future research.

##### **METHODS:**

: A narrative review of the major theoretical approaches to AP and of the empirical evidence regarding the effects of AP interventions, followed by an integrative discussion.

##### **RESULTS:**

: The concept of AP is derived from 2 main traditions: operant and energy conservation. Although there are common elements across these traditions, significant conceptual and practical differences exist, which has led to confusion. Little empirical evidence exists concerning the efficacy of AP as a treatment for chronic pain.

##### **DISCUSSION:**

: Future research on AP should be based on a clear theoretical foundation, consider the context in which the AP behavior occurs and the type of pacing problem ("underactivity" vs. "overactivity"), and should examine the impact of AP treatment on multiple clinical outcomes. We provide a provisional definition of AP and specific recommendations that we believe will move the field forward.

PMID: 23247005

## Pain/Motivation

J Pain. 2013 Mar 21. pii: S1526-5900(13)00030-8. doi: 10.1016/j.jpain.2013.01.006. [Epub ahead of print]

### **A Motivational Therapeutic Assessment Improves Pain, Mood, and Relationship Satisfaction in Couples With Chronic Pain.**

Miller LR, Cano A, Wurm LH.

#### **Source**

Wayne State University, Detroit, Michigan.

#### **Abstract**

The current study tested whether a therapeutic assessment improved pain and well-being in couples facing chronic pain.

Couples (N = 47) in which 1 spouse had chronic pain completed surveys about pain, mood, marital satisfaction, and empathy, followed by an interview and an assessment session to which they were randomly assigned: a tailored assessment of their marriage and pain coping that incorporated motivational interviewing strategies, or a control condition that included education about the gate control theory of pain. Multilevel modeling revealed that couples in the motivational assessment group experienced significant decreases in pain severity and negative mood, and increases in marital satisfaction and positive mood from baseline to postassessment, relative to the education control group. All participants experienced increases in empathy toward their partner except for spouses in the control group, who experienced declines in spousal empathy. The motivational assessment and control groups did not experience differential change in any of the variables at 1-month follow-up. Moderators of improvement were also explored, including age, race, gender, education, pain duration, spouse pain status, and marriage duration. The results provide preliminary evidence for the short-term benefits of a brief motivational assessment to improve psychosocial functioning in both patients and spouses.

**PERSPECTIVE:** This article presents preliminary evidence in support of a brief therapeutic psychosocial assessment for couples with chronic pain. Assessments such as this may potentially help patients and their spouses feel more optimistic about pain treatment and increase the likelihood of entering treatment.

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PMID: 23523023

## Pain/Emotional

*Clin J Pain.* 2013 May;29(5):425-34. doi: 10.1097/AJP.0b013e31825e454e.

### **Association of trauma, posttraumatic stress disorder, and experimental pain response in healthy young women.**

Gómez-Pérez L, López-Martínez AE.

#### **Source**

\*Anxiety and Illness Behaviours Laboratory, Department of Psychology, University of Regina, Regina, SK, Canada †Departamento de Personalidad, Evaluación y Tratamiento Psicológico, Facultad de Psicología, Universidad de Málaga, Málaga, Spain.

#### **Abstract**

##### **BACKGROUND:**

: Evidence of pain alterations in trauma-exposed individuals has been found. The presence of posttraumatic stress disorder (PTSD) may be explaining these alterations, as some of the psychological characteristics of PTSD are hypothesized to increase pain response.

##### **OBJECTIVES:**

: To examine differences in pain response and in certain psychological variables between trauma-exposed women (TEW) with PTSD, TEW without PTSD, and non-trauma-exposed women (NTEW) and to explore the role of these psychological variables in the differences in pain response between the groups.

##### **METHODS:**

: A total of 122 female students completed a cold pressor task (42 TEW with PTSD, 40 TEW without PTSD, and 40 NTEW). Anxiety sensitivity, experiential avoidance, trait and state dissociation, depressive symptoms, state anxiety, catastrophizing, and arousal were assessed.

##### **RESULTS:**

: TEW with PTSD reported significantly higher pain unpleasantness than NTEW, but not more than that of TEW without PTSD. They also presented higher trait dissociation, state anxiety, depressive symptoms, and skin conductance than the other 2 groups and higher anxiety sensitivity than TEW without PTSD. TEW without PTSD reported more pain unpleasantness than NTEW, but they recovered faster from pain. However, these differences were not explained by any psychological variable.

##### **CONCLUSIONS:**

: The results suggest that although trauma-exposed individuals are not more sensitive to painful stimulation, they evaluate pain in a more negative way. Exposure to trauma itself, but not to PTSD, may explain the differences found in pain unpleasantness.

PMID: 23183263

## Pain/adolescents

J Pain. 2013 Mar 26. pii: S1526-5900(13)00037-0. doi: 10.1016/j.jpain.2013.01.010. [Epub ahead of print]

### **Conditioned Pain Modulation in Children and Adolescents: Effects of Sex and Age.**

Tsao JC, Seidman LC, Evans S, Lung KC, Zeltzer LK, Naliboff BD.

#### **Source**

Pediatric Pain Program, Department of Pediatrics, David Geffen School of Medicine at UCLA, Los Angeles, California. Electronic address: jtsao@mednet.ucla.edu.

#### **Abstract**

Conditioned pain modulation (CPM) refers to the diminution of perceived pain intensity for a test stimulus following application of a conditioning stimulus to a remote area of the body, and is thought to reflect the descending inhibition of nociceptive signals.

Studying CPM in children may inform interventions to enhance central pain inhibition within a developmental framework. We assessed CPM in 133 healthy children (mean age = 13 years; 52.6% girls) and tested the effects of sex and age. Participants were exposed to 4 trials of a pressure test stimulus before, during, and after the application of a cold water conditioning stimulus. CPM was documented by a reduction in pressure pain ratings during cold water administration. Older children (12-17 years) exhibited greater CPM than younger children (8-11 years). No sex differences in CPM were found. Lower heart rate variability at baseline and after pain induction was associated with less CPM, controlling for child age.

The findings of greater CPM in the older age cohort suggest a developmental improvement in central pain inhibitory mechanisms. The results highlight the need to examine developmental and contributory factors in central pain inhibitory mechanisms in children to guide effective, age appropriate pain interventions.

**PERSPECTIVE:** In this healthy sample, younger children exhibited less CPM than did older adolescents, suggesting a developmental improvement in CPM. Cardiac vagal tone was associated with CPM across age. The current findings may inform the development of targeted, developmentally appropriate pain interventions for children.

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PMID: 23541066

## Exercise pain

Clin J Pain. 2013 May;29(5):443-9. doi: 10.1097/AJP.0b013e318262ddfe.

### **Prior eccentric exercise augments muscle pain and perception of effort during cycling exercise.**

Black CD, Dobson RM.

#### **Source**

\*Department of Health, Exercise Science, and Recreation Management, University of Mississippi, Oxford, MS †Department of Kinesiology, Georgia College and State University, Milledgeville, GA.

#### **Abstract**

##### **OBJECTIVES:**

: This study examined the effects of exercise-induced muscle damage (EIMD) on the physiological and perceptual responses to 30 minutes of submaximal cycling at 60% of oxygen consumption (VO<sub>2</sub> peak).

##### **METHODS:**

: Ten participants completed two 30-minute bouts of cycling, one before and one 48 hours after performance of strenuous (24 contractions with 120% of concentric 1-repetition maximum) eccentric exercise.

##### **RESULTS:**

: Eccentric exercise resulted in a significant delayed-onset muscle pain (1.6±1.6 mm to 44.8±20 mm on a 100-mm visual analog scale; P<0.001) and a 15% (P<0.001) reduction in maximal strength 48 hours after exercise. Ratings of quadriceps muscle pain (1.99±0.42 vs. 3.30±0.56; P=0.003) and perceived exertion (RPE; 13.0±0.30 vs. 13.8±0.61; P=0.02) were elevated during cycling after EIMD at identical work rates. No changes were observed in VO<sub>2</sub> (29.6±4.6 vs. 30.2±4.4 mL/kg/min; P=0.41), heart rate (154±15 vs. 155±9 beats/min; P=0.58), and ventilation (57.2±12.1 vs. 59.8±12.7 L/min; P=0.13) during exercise after EIMD. The mean change in RPE was significantly correlated (r=0.56; P<0.01) with the change in muscle pain during cycling and delayed-onset pain during resistance exercise (r=0.86; P<0.01), but did not correlate with changes in VO<sub>2</sub>, heart rate, ventilation, and maximal strength.

##### **DISCUSSION:**

: These findings indicate the elevations in RPE after EIMD are likely a consequence of the EIMD with the most likely explanation being an increase in localized pain before and during cycling exercise.

PMID: 23328320

LBP/peripheral nerve stim

Neuromodulation. 2013 Apr 11. doi: 10.1111/ner.12055. [Epub ahead of print]

**Peripheral Nerve Field Stimulation for the Management of Localized Chronic Intractable Back Pain: Results From a Randomized Controlled Study.**

McRoberts WP, Wolkowitz R, Meyer DJ, Lipov E, Joshi J, Davis B, Cairns KD, Barolat G.

**Source**

Holy Cross Orthopedic Institute, Fort Lauderdale, FL, USA.

**Abstract**

**OBJECTIVES:**

Improved device technology has caused a renewed interest in peripheral nerve field stimulation (PNfS). This study sought to obtain preliminary estimates of the safety and efficacy of PNfS in patients with localized chronic intractable pain of the back.

**MATERIALS AND METHODS:**

This Institutional Review Board-approved, prospective, randomized, controlled, crossover study consisted of two phases. During phase I, patients rotated through four stimulation groups (minimal, subthreshold, low frequency, and standard stimulation). If a 50% reduction in pain was achieved during any of the three active stimulation groups (responder), the patient proceeded to phase II, which began with implant of the permanent system and lasted 52 weeks. The primary endpoint was a reduction in pain, assessed by the visual analog scale (VAS). Analysis of variance, including the effects of patient, treatment, and study period, was used for phase I results. Phase II results were analyzed by paired t-tests.

**RESULTS:**

A total of 44 patients were enrolled at five sites. Of these patients, 32 were implanted with a trial system and 30 completed phase I. During phase I, there were significant differences in mean VAS scores between minimal stimulation and subthreshold stimulation ( $p = 0.003$ ), low frequency stimulation ( $p < 0.001$ ), and standard stimulation ( $p < 0.001$ ). Twenty-four patients were classified as responders to the therapy, and 23 patients received permanent system placement. Significant differences in VAS scores were observed between baseline and all follow-up visits during phase II ( $p < 0.001$ )

**CONCLUSIONS:** The results provide evidence to support safety and effectiveness of PNfS as an aid in the management of chronic, localized back pain.

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PMID: 23577773

**Reflex receptive fields are enlarged in patients with musculoskeletal low back and neck pain**  
□Pain, 04/15/2013 Clinical Article

Manresa JAB et al. –

A recent investigation showed that patients with endometriosis pain display enlarged reflex receptive fields (RRF), providing a new perspective in the identification of possible mechanisms behind hypersensitivity states in humans. These results evidence that musculoskeletal pain conditions are characterized by enlarged RRF, lowered NWR and pain thresholds and facilitated temporal summation, most likely caused by widespread spinal hyperexcitability. This study contributes to a better understanding of the mechanisms underlying these pain conditions, and supports the use of the RRF and NWR as objective biomarkers for pain hypersensitivity in clinical and experimental pain research.

**Methods**

- The primary hypothesis of this study was that RRF are enlarged in musculoskeletal pain patients.
- Secondary endpoints were subjective pain thresholds and nociceptive withdrawal reflex (NWR) thresholds after single and repeated (temporal summation) electrical stimulation.
- Forty chronic neck pain patients, forty chronic low back pain patients and twenty four acute low back pain patients were tested.
- Electrical stimuli were applied to ten sites on the foot sole to quantify the RRF, defined as the area of the foot from where a reflex was evoked.
- For the secondary endpoints, electrical stimuli were applied to the cutaneous innervation area of the sural nerve.

**Results**

All patient groups presented enlarged RRF areas compared to pain-free volunteers ( $p < 0.001$ ).

Moreover, they also displayed lower NWR and pain thresholds to single and repeated electrical stimulation ( $p < 0.001$ ).

Read more: <http://www.mdlinx.com/pain-management/news-article.cfm/4566006/#ixzz2Rm3gWqRS>

## Migraine/Aura/vascular

### Migraine, headache and development of metabolic syndrome: An 11 year follow-up in the HUNT Study

- [Bendik Slagsvold Winsvold](#), [Irene Sandven](#), [Knut Hagen](#), [Mattias Linde](#),  
[Kristian Midthjell](#), [John-Anker Zwart](#)
- **Pain, 04/15/2013**

#### Abstract

Migraine with aura is associated with an increased incidence of stroke and cardiovascular disease, but the biological mechanisms are poorly understood. This study examined the incidence of metabolic syndrome and its relation to migraine with and without aura, and non-migraine headache. In the population-based HUNT cohort study 19,895 individuals were followed for the development of metabolic syndrome, with a median follow-up time of 11.3 years. Headache diagnoses were based on a validated headache questionnaire, and metabolic syndrome on a modified version of the National Cholesterol Education Program's Adult Treatment Panel (ATP) III criteria, using objective anthropometric measurements and blood biochemistry. Using the Poisson regression model migraine with aura was associated with an increased risk of developing metabolic syndrome. The effect was modified by smoking, with an adjusted incident risk ratio (IRR) among smokers of 2.10 (95% CI 1.53-2.89) and among non-smokers of 1.39 (95% CI 1.03-1.86), when compared to headache free controls. A moderate risk increase was seen for migraine without aura (IRR 1.26, 95% CI 1.12-1.42) and non-migraine headache (IRR 1.22, 95% CI 1.13-1.32), not modified by smoking.

The results suggest that traditional risk factors may be one of the mechanisms through which migraine with aura is linked to an increased risk of cardiovascular disease. A heightened vigilance towards cardiovascular risk factors in this patient group may be warranted.

## Fibromyalgia/Fine motor control

Exp Brain Res. 2013 Apr;226(1):137-43. doi: 10.1007/s00221-013-3417-4. Epub 2013 Jan 26.

### **Bilateral deficits in fine motor control ability and manual dexterity in women with fibromyalgia syndrome.**

Pérez-de-Heredia-Torres M, Martínez-Piédrola RM, Cigarán-Méndez M, Ortega-Santiago R, Fernández-de-Las-Peñas C.

#### **Source**

Department of Physical Therapy, Occupational Therapy, Rehabilitation and Physical Medicine, Universidad Rey Juan Carlos, Alcorcón, Madrid, Spain.

#### **Abstract**

The aim of the current study was to investigate fine motor control ability and manual dexterity women with fibromyalgia syndrome (FMS) without symptoms in the upper extremity compared to healthy women. Subtests of the Purdue Pegboard Test (one-hand, bilateral and assembly) and of the Jebsen-Taylor hand-function test (writing, turning cards, picking up small, light and large heavy objects, simulated feeding and stacking checkers) were evaluated bilaterally in 20 women with FMS (aged 35-55 years) without symptoms in the upper limb and 20 age- and hand dominance-matched healthy women. Differences between sides and groups were analysed with several analysis of variance (ANOVA). The ANOVA revealed significant differences between groups ( $P < 0.001$ ) and sides ( $P = 0.007$ ) for one-hand pin placement subtest: women with FMS showed bilateral worse scores than controls. Patients also exhibited significantly lower scores in bilateral pin placement and assembly subtests when compared to healthy controls ( $P < 0.001$ ). The ANOVA also revealed significant differences between groups for writing, turning over cards, picking up small objects, stacking checkers, picking up large light objects and picking up large heavy objects (all,  $P < 0.001$ ): women with FMS needed more time for these subtests than healthy women with both hands. No difference for simulated feeding was found between groups.

Our findings revealed bilateral deficits in fine motor control ability and manual dexterity in patients with FMS without symptoms in the upper extremity. These deficits are not related to the clinical features of the symptoms supporting an underlying central mechanism of altered motor control.

PMID: 23354668

## Pain/Hypertrophic breasts

### **Reduction mammoplasty improves body posture and decreases the perception of pain**

Canadian Journal of Plastic Surgery, 04/10/2013

Women with hypertrophic breasts often experience body pain and posture problems, which tend to be reduced or even eliminated after reduction mammoplasty. The present study aimed to analyze the effects of reduction mammoplasty on anthropometric variables, body posture and pain in women with breast hypertrophy. Eleven women (mean [ $\pm$  SD] age 31.3 $\pm$ 10.4 years) participated in the present study. Anthropometric variables, body posture and pain perception were evaluated pretest, and 60 (post60) and 90 (post90) days after reduction mammoplasty. Commercially available posture analysis software was used to analyze the following variables: acromial horizontal alignment (AHA), angle between acromial and anterior superior iliac spines (A-AAIS), vertical alignment of right (R) and left (L) trunk (VAT), vertical alignment of R and L body (VAB) and horizontal alignment of R and L pelvis (HAP). Descriptive statistics and ANOVA for repeated measures were used, and effect sizes (ES) were measured; the level of significance was set at  $P < 0.05$ . There were no significant differences in anthropometric variables among the assessments. Only HAP-R showed a significant decrease; however, when analyzed, ES, VAT-L and HAP-L in post60, and VAT-R, VAT-L, HAP-R, HAP-L and VAB-L in post90 showed large ES after mammoplasty ( $ES > 0.70$ ). There were significant reductions in pain at post60 and post90 in the neck, cervical spine, back, shoulder and arm ( $P < 0.05$ ). Following mammoplasty, an improvement in body posture, primarily in the alignment of shoulders, trunk and pelvis, and a decrease in pain in the upper limbs and spine, were observed.

## Headache/TBI

Cephalalgia. 2013 Apr 19. [Epub ahead of print]

### **Prediction of headache severity (density and functional impact) after traumatic brain injury: A longitudinal multicenter study.**

Walker WC, Marwitz JH, Wilk AR, Ketchum JM, Hoffman JM, Brown AW, Lucas S.

#### **Source**

Department of Physical Medicine and Rehabilitation, Virginia Commonwealth University, VA, USA.

#### **Abstract**

**BACKGROUND::** Headache (HA) following traumatic brain injury (TBI) is common, but predictors and time course are not well established, particularly after moderate to severe TBI.

**METHODS::** A prospective, longitudinal cohort study of HA severity post-TBI was conducted on 450 participants at seven participating rehabilitation centers. Generalized linear mixed-effects models (GLMMs) were used to model repeated measures (months 3, 6, and 12 post-TBI) of two outcomes: HA density (a composite of frequency, duration, and intensity) and HA disruptions to activities of daily living (ADL).

**RESULTS::** Although HA density and ADL disruptions were nominally highest during the first three months post-TBI, neither showed significant changes over time. At all time points, history of pre-injury migraine was by far the strongest predictor of both HA density and ADL disruptions (odds ratio (OR) = 8.0 and OR = 7.2, averaged across time points, respectively). Furthermore, pre-injury non-migraine HA (at three and six months post-TBI), penetrating-type TBI (at six months post-TBI), and female sex (at six and 12 months post-TBI) were each associated with an increase in the odds of a more severe HA density. Severity of TBI (post-traumatic amnesia (PTA) duration) was not associated with either outcome.

**CONCLUSION::** Individuals with HA at three months after moderate-severe TBI do not improve over the ensuing nine months with respect to HA density or ADL disruptions. Those with pre-injury HA, particularly of migraine type, are at greatest risk for HA post-TBI. Other independent risk factors are penetrating-type TBI and, to a lesser degree and post-acutely only, female sex. Individuals with these risk factors should be monitored and considered for aggressive early intervention.

PMID: 23575819

## LBP

*Physiotherapy*. 2013 Mar 19. pii: S0031-9406(12)00135-6. doi: 10.1016/j.physio.2012.09.007.  
[Epub ahead of print]

### **Preliminary evidence for the features of non-reducible discogenic low back pain: survey of an international physiotherapy expert panel with the Delphi technique.**

Chan AY, Ford JJ, McMeeken JM, Wilde VE.

#### **Source**

School of Physiotherapy, Faculty of Health Sciences, La Trobe University, Bundoora, Australia.  
Electronic address: ay2chan@students.latrobe.edu.au.

#### **Abstract**

##### **OBJECTIVES:**

The lumbar intervertebral disc is a known source of low back pain (LBP). Various clinical features of discogenic pain have been proposed, but none have been validated. Several subgroups of discogenic pain have been hypothesised, with non-reducible discogenic pain (NRDP) proposed as a relevant clinical subgroup. The objectives of this study were to obtain consensus from an expert panel on the features of discogenic low back pain, the existence of subgroups of discogenic LBP, particularly NRDP, and the associated features of NRDP.

##### **DESIGN:**

Three-round Delphi survey.

##### **PARTICIPANTS:**

Twenty-one international physiotherapists with expertise in LBP.

##### **METHODS:**

Panellists listed and ranked features that they believed to be indicative of discogenic pain and NRDP. On completion of Round 3, features with  $\geq 50\%$  agreement between panellists were deemed to have reached consensus.

##### **RESULTS:**

After three rounds, 10 features of discogenic LBP were identified. Nineteen of the panellists believed that NRDP was a subgroup of discogenic LBP, and nine features of NRDP were identified.

##### **CONCLUSION:**

This study provides preliminary validation for the features associated with discogenic LBP. It also provides evidence supporting the existence and features of NRDP as a separate clinical subgroup of discogenic LBP.

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PMID: 23517665

## LBP/Training

*Clin J Sport Med.* 2013 Mar 15. [Epub ahead of print]

### **Lumbopelvic Neuromuscular Training and Injury Rehabilitation: A Systematic Review.**

Briggs MS, Givens DL, Best TM, Chaudhari AM.

#### **Source**

\*Health and Rehabilitation Sciences PhD Program, School of Health and Rehabilitation Sciences, College of Medicine, The Ohio State University, Columbus, Ohio †Division of Physical Therapy, School of Health and Rehabilitation Sciences, College of Medicine, The Ohio State University, Columbus, Ohio ‡Sports Health and Performance Institute, OSU Sports Medicine, The Ohio State University Wexner Medical Center, Columbus, Ohio §Department of Physical Therapy, School of Pharmacy and Health Professions, Creighton University, Omaha, Nebraska ¶Department of Family Medicine and ††Orthopaedics, The Ohio State University Wexner Medical Center, Columbus, Ohio \*\*Perfect Practice, Inc, Canal Winchester, Ohio.

#### **Abstract**

**OBJECTIVE::** The aim of this systematic review was to assess the evidence for lumbopelvic neuromuscular training (LNMT) in individuals after musculoskeletal (MSK) injury.

**DATA SOURCES::** A literature search of PubMed and EMBASE databases was performed for English studies from January 1990 to March 2012. Search terms including and related to trunk, core, stability, injury, and LNMT were used.

**STUDY SELECTION::** All studies directly involving LNMT for MSK injuries were reviewed by 2 authors. These articles were assessed based on the inclusion criteria and if appropriate selected for further analysis. Expert opinion, review articles, and articles involving non-MSK injuries were excluded. Four authors then scored the selected articles for methodological quality. A total of 2312 articles were initially identified. Twenty-nine articles met the inclusion criteria for review and were divided into categories of lower extremity (LE), lumbar, and upper extremity (UE). No trials involving the UE met the inclusion criteria.

**DATA EXTRACTION::** Data including subject demographics (age, height, weight, gender, etc.), injury type, intervention type, and outcome measurements were extracted from the relevant articles. A variety of baseline and follow-up scores were extracted including pain levels, patient satisfaction, disability questionnaires, and other functional outcomes.

**DATA SYNTHESIS::** Two out of 3 LE randomized controlled trials (RCTs) and 9/26 lumbar RCTs were rated with high methodological quality based on the scoring system described by van Tulder et al. The average quality score for the LE RCTs was 6.3 (range = 4-9) and for the lumbar RCTs was 5.1 (range = 2-9). The evidence for the effectiveness of the 3 LE studies was rated as conflicting, whereas 24 lumbar studies demonstrated moderate-to-strong evidence. Unfortunately, heterogeneity of populations, interventions, and outcomes precluded a quantitative meta-analysis and specific clinical recommendations.

**CONCLUSIONS::** High-quality evidence is lacking to make specific clinical recommendations for or against the use of LNMT in the rehabilitation of individuals after MSK injury. Based on this review, future research should focus on well-defined, homogeneous populations, interventions specifically addressing neuromuscular activation of the lumbopelvic musculature, patient specific clinical outcomes, measures of motor control, biomechanics, and return to specific activities.

PMID: 23507794

LBP/

Phys Ther. 2013 Mar 15. [Epub ahead of print]

**Multifidus and Paraspinal Muscle Group Cross-Sectional Areas of Patients With Low Back Pain and Controls: A Systematic Review With a Focus on Blinding.**

Fortin M, Macedo LG.

**Source**

M. Fortin, BSc, CAT(C), Common Spinal Disorders Research Group, Faculty of Rehabilitation Medicine, University of Alberta, 3-48 Corbett Hall, Edmonton, Alberta, Canada T6G 2G4.

**Abstract**

**BACKGROUND::** Several studies have investigated differences in paraspinal muscle morphology between LBP patients and controls. However, inconsistencies in the results of some of these studies may limit generalizations.

**PURPOSE::** To systematically review studies evaluating paraspinal muscle morphology in LBP patients and controls, with a focus on the effects of blinding.

**DATA SOURCES::** An electronic search was performed using relevant databases. Study quality was evaluated using the Newcastle assessment score.

**STUDY SELECTION::** Case-control studies investigating paraspinal muscle size between LBP patients and healthy controls were included. Studies that compared paraspinal muscle size between symptomatic and asymptomatic sides of unilateral LBP patients were also included.

**DATA EXTRACTION::** Studies investigating the same outcome, at the same spinal level, for the same muscle and population were pooled using RevMan 5.1. Mean difference with 95% CI was calculated for each study.

**DATA SYNTHESIS::** Eleven studies were included. All, but one pooled result were statistically significant different between groups, suggesting that paraspinal muscles are smaller in chronic LBP patients than controls, and on the symptomatic side of chronic unilateral LBP patients. In acute unilateral LBP patients there was no significant difference between sides. A qualitative examination demonstrated a trend towards an increased effect size when outcome assessors were unblinded.

**LIMITATIONS::** Limitations of this review include the small number of studies included and their small sample size. Misclassification of blinding status may have occurred when the study did not report blinding status.

**CONCLUSION::** Evidence suggests that paraspinal muscles are significantly smaller in patients with chronic LBP than in controls. Although no definite conclusion could be taken as to the effects of blinding, future imaging studies should consider the use blinded outcome assessors.

PMID: 23504343

## LBP/Radicular/testing

*Spine J.* 2013 Mar 14. pii: S1529-9430(13)00164-2. doi: 10.1016/j.spinee.2013.02.007.

### **Neurological examination of the peripheral nervous system to diagnose lumbar spinal disc herniation with suspected radiculopathy: a systematic review and meta-analysis.**

Al Nezari NH, Schneiders AG, Hendrick PA.

#### **BACKGROUND CONTEXT:**

Disc herniation is a common low back pain (LBP) disorder, and several clinical test procedures are routinely employed in its diagnosis. The neurological examination that assesses sensory neuron and motor responses has historically played a role in the differential diagnosis of disc herniation, particularly when radiculopathy is suspected; however, the diagnostic ability of this examination has not been explicitly investigated.

#### **PURPOSE:**

To review the scientific literature to evaluate the diagnostic accuracy of the neurological examination to detect lumbar disc herniation with suspected radiculopathy.

#### **METHODS:**

Six major electronic databases were searched with no date or language restrictions for relevant articles up until March 2011. All diagnostic studies investigating neurological impairments in LBP patients because of lumbar disc herniation were assessed for possible inclusion. Retrieved studies were individually evaluated and assessed for quality using the Quality Assessment of Diagnostic Accuracy Studies tool, and where appropriate, a meta-analysis was performed.

#### **RESULTS:**

A total of 14 studies that investigated three standard neurological examination components, sensory, motor, and reflexes, met the study criteria and were included. Eight distinct meta-analyses were performed that compared the findings of the neurological examination with the reference standard results from surgery, radiology (magnetic resonance imaging, computed tomography, and myelography), and radiological findings at specific lumbar levels of disc herniation. Pooled data for sensory testing demonstrated low diagnostic sensitivity for surgically (0.40) and radiologically (0.32) confirmed disc herniation, and identification of a specific level of disc herniation (0.35), with moderate specificity achieved for all the three reference standards (0.59, 0.72, and 0.64, respectively). Motor testing for paresis demonstrated similarly low pooled diagnostic sensitivities (0.22 and 0.40) and moderate specificity values (0.79 and 0.62) for surgically and radiologically determined disc herniation, whereas motor testing for muscle atrophy resulted in a pooled sensitivity of 0.31 and the specificity was 0.76 for surgically determined disc herniation. For reflex testing, the pooled sensitivities for surgically and radiologically confirmed levels of disc herniation were 0.29 and 0.25, whereas the specificity values were 0.78 and 0.75, respectively. The pooled positive likelihood ratios for all neurological examination components ranged between 1.02 and 1.26.

#### **CONCLUSIONS:**

This systematic review and meta-analysis demonstrate that neurological testing procedures have limited overall diagnostic accuracy in detecting disc herniation with suspected radiculopathy. Pooled diagnostic accuracy values of the tests were poor, whereby all tests demonstrated low sensitivity, moderate specificity, and limited diagnostic accuracy independent of the disc herniation reference standard or the specific level of herniation. The lack of a standardized classification criterion for disc herniation, the variable psychometric properties of the testing procedures, and the complex pathoetiology of lumbar disc herniation with radiculopathy are suggested as possible reasons for these findings. Copyright © 2013 Elsevier Inc. All rights reserved. PMID: 23499340

## C spine/stress test

Phys Ther. 2013 Mar 28. [Epub ahead of print]

### **Toward Understanding Normal Craniocervical Rotation Occurring During the Rotation Stress Test for the Alar Ligaments.**

Osmotherly PG, Rivett D, Rowe LJ.

#### **Source**

P.G. Osmotherly, MMedSc(Clinical Epidemiology), BSc, GradDipPhysiotherapy, School of Health Sciences, Faculty of Health, University of Newcastle, Newcastle, New South Wales 2308, Australia.

#### **Abstract**

##### **BACKGROUND:**

The rotation stress test is recommended for assessing alar ligament integrity. Whilst authors accept that rotation will occur during testing, estimates of range occurring with a normal test response vary between 20° and 40°. None of these estimates are based upon formal examination of the test.

##### **OBJECTIVE:**

The purposes of this study were: (1) to examine the range of craniocervical rotation occurring during rotation stress testing for the alar ligaments in healthy individuals and (2) to investigate a measurement protocol for quantifying rotation.

##### **DESIGN:**

A within-participant experimental study was conducted.

##### **METHODS:**

Sixteen participants underwent MRI in neutral and end-range rotation stress test positions. Measurements made followed a standardised protocol relative to position of the axis. A line connecting the foraminae transversaria of the axis created a reference plane. Position of the occiput in the head-neutral position was calculated as the angle formed between a line joining the foraminae lacerum and the reference plane. Measurements were repeated at the end-range test position. Total rotation of the occiput was calculated as the difference in angles measured in neutral and test positions. Measurement was performed on four occasions and reliability of measurements assessed using SEM and ICC.

##### **RESULTS:**

Measurement of rotation of the occiput relative to a stabilised axis ranged between 1.7° and 21.5° (mean 10.6°, SD 5.1°). SEM was 1.14° and ICC = 0.96 (95%CI 0.90 to 0.98).

##### **LIMITATIONS:**

Sustaining the test position for imaging increased potential for loss of end-range position and image quality. Testing could only be performed in neutral, not in three planes as commonly described.

##### **CONCLUSIONS:**

Range of craniocervical rotation during rotation stress testing of intact alar ligaments should typically be 21° or less. Rotation may be quantified using the method protocol outlined.

PMID: 23538587

## C spine/Stress test/Alar

*J Rehabil Med.* 2013 Mar 28;45(4):376-84. doi: 10.2340/16501977-1120.

### **Increased neck muscle activity and impaired balance among females with whiplash-related chronic neck pain: A cross-sectional study.**

Juul-Kristensen B, Clausen B, Ris I, Jensen RV, Steffensen RF, Chreiteh SS, Jørgensen MB, Søgaard K.

#### **Source**

Research Unit for Musculoskeletal function and Physiotherapy, University of Southern Denmark, 5230 Odense M, Denmark.

#### **Abstract**

**Objective:** To investigate neck muscle activity and postural control in patients with whiplash-associated disorder compared with healthy controls.

**Design:** Cross-sectional study with convenience sampling.

**Subjects:** Ten females with whiplash-associated disorder (age 37.7 years (21-58), neck pain > 2 years and Neck Disability Index (NDI) > 10) and 10 healthy female controls (age 35.9 years (21-53), NDI < 6).

**Methods:** Surface electromyography measured muscle activity of the anterior scalene, sternocleidomastoid, neck extensors and upper trapezius muscles, expressed as mean relative activity related to maximum voluntary electromyography (%MVE). On a force plate, 3 balance tasks (Romberg stance with open and closed eyes, 1-legged stance) and a perturbation task with sudden unloading, were performed. The total area, areas from slow and fast components, and range of displacements were calculated from decomposed centre of pressure anterior-posterior and medial-lateral signals.

**Results:** During balance tasks with closed eyes and one-legged stance, the relative mean activity of all 4 muscles was significantly increased in whiplash-associated disorder compared with healthy controls. Postural sway was also significantly increased.

**Conclusion:** Increased neck muscle activity and increased postural sway during simple balance tasks indicate disturbed sensory feedback patterns in people with whiplash-associated disorder, which may have negative consequences when performing daily activities.

PMID: 23467989

Eur J Appl Physiol. 2013 Apr;113(4):997-1004. doi: 10.1007/s00421-012-2513-7. Epub 2012 Oct 10.

**Intensive unilateral neuromuscular training on non-dominant side of low back improves balanced muscle response and spinal stability.**

Kim Y, Son J, Yoon B.

**Source**

Department of Physical Therapy, College of Health Sciences, Korea University, Jeongneung 3-Dong, Sungbuk-Gu, Seoul 136-703, Republic of Korea.

**Abstract**

Effective stabilization is important to increase sports performance.

Imbalanced spinal muscle responses between the left and right sides increase the risk of spinal buckling and microtrauma at the intervertebral joints.

The purpose of this study was to confirm whether intensive unilateral neuromuscular training (IUNT) focusing on the non-dominant side of the low back improves balanced muscle responses and spinal stability. The IUNT group (n = 8) performed side bridge and quadruped exercises using their non-dominant trunk muscles for 8 weeks, while the control group (n = 8) performed their regular training. Before and after the training, motion-capture cameras measured trunk angular displacement, and electromyography recorded the activities of both multifidus muscles (L4-5) during unexpected sudden forward perturbation. After the training in the IUNT group, the difference in onset time between both sides decreased to approximately 120 % compared with that before the training. The asymmetry of muscle activities also decreased from 56 to 23 %. Moreover, the angular displacement on the sagittal plane decreased to approximately 35 % after the training.

We expect that IUNT focused on the non-dominant side of the low back will be useful to improve balanced back muscle responses and spinal stability during sudden trunk perturbation.

PMID: 23053132

## Knee/Meniscus/PT

N Engl J Med. 2013 Mar 18. [Epub ahead of print]

### **Surgery versus Physical Therapy for a Meniscal Tear and Osteoarthritis.**

Katz JN, Brophy RH, Chaisson CE, de Chaves L, Cole BJ, Dahm DL, Donnell-Fink LA, Guermazi A, Haas AK, Jones MH, Levy BA, Mandl LA, Martin SD, Marx RG, Miniaci A, Matava MJ, Palmisano J, Reinke EK, Richardson BE, Rome BN, Safran-Norton CE, Skoniecki DJ, Solomon DH, Smith MV, Spindler KP, Stuart MJ, Wright J, Wright RW, Losina E.

#### **Source**

From Brigham and Women's Hospital (J.N.K., L.C., L.A.D.-F., S.D.M., B.N.R., C.E.S.-N., D.J.S., D.H.S., J.W., E.L.) and Boston University (C.E.C., A.G., J.P.) - both in Boston; Washington University, St. Louis (R.H.B., A.K.H., M.J.M., M.V.S., R.W.W.); Rush University, Chicago (B.J.C.); Mayo Clinic, Rochester, MN (D.L.D., B.A.L., M.J.S.); Cleveland Clinic, Cleveland (M.H.J., A.M.); Hospital for Special Surgery, New York (L.A.M., R.G.M.); and Vanderbilt University, Nashville (E.K.R., B.E.R., K.P.S.).

#### **Abstract**

**Background** Whether arthroscopic partial meniscectomy for symptomatic patients with a meniscal tear and knee osteoarthritis results in better functional outcomes than nonoperative therapy is uncertain.

**Methods** We conducted a multicenter, randomized, controlled trial involving symptomatic patients 45 years of age or older with a meniscal tear and evidence of mild-to-moderate osteoarthritis on imaging. We randomly assigned 351 patients to surgery and postoperative physical therapy or to a standardized physical-therapy regimen (with the option to cross over to surgery at the discretion of the patient and surgeon). The patients were evaluated at 6 and 12 months. The primary outcome was the difference between the groups with respect to the change in the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) physical-function score (ranging from 0 to 100, with higher scores indicating more severe symptoms) 6 months after randomization.

**Results** In the intention-to-treat analysis, the mean improvement in the WOMAC score after 6 months was 20.9 points (95% confidence interval [CI], 17.9 to 23.9) in the surgical group and 18.5 (95% CI, 15.6 to 21.5) in the physical-therapy group (mean difference, 2.4 points; 95% CI, -1.8 to 6.5). At 6 months, 51 active participants in the study who were assigned to physical therapy alone (30%) had undergone surgery, and 9 patients assigned to surgery (6%) had not undergone surgery.

The results at 12 months were similar to those at 6 months. The frequency of adverse events did not differ significantly between the groups.

**Conclusions** In the intention-to-treat analysis, we did not find significant differences between the study groups in functional improvement 6 months after randomization; however, 30% of the patients who were assigned to physical therapy alone underwent surgery within 6 months. (Funded by the National Institute of Arthritis and Musculoskeletal and Skin Diseases; METEOR ClinicalTrials.gov number, NCT00597012 .).

PMID: 23506518

## Hamstring strain

J Orthop Sports Phys Ther. 2013 Mar 13. [Epub ahead of print]

### **Clinical and Morphological Changes Following 2 Rehabilitation Programs for Acute Hamstring Strain Injuries: A Randomized Clinical Trial.**

Silder A, Sherry MA, Sanfilippo J, Tuite MJ, Hetzel SJ, Heiderscheid BC.

#### **Abstract**

#### **STUDY DESIGN:**

Randomized Clinical Trial.

#### **OBJECTIVES:**

To assess differences between a progressive agility and trunk stabilization (PATS) and a progressive running and eccentric strengthening (PRES) rehabilitation program on recovery characteristics following an acute hamstring injury, as measured via physical examination and magnetic resonance imaging (MRI).

#### **BACKGROUND:**

Determining the type of rehabilitation program that most effectively promotes muscle and functional recovery is essential to minimizing re-injury risk and optimizing athlete performance.

#### **METHODS:**

Individuals who sustained a recent hamstring strain injury were randomly assigned to 1 of 2 rehabilitation programs, PATS or PRES. MRI and physical examinations were conducted before and after completion of rehabilitation.

#### **RESULTS:**

Thirty-one subjects were enrolled, 29 began rehabilitation, and 25 completed rehabilitation. There were few differences in clinical or morphological outcome measures between rehabilitation groups across time, and re-injury rates were low for both rehabilitation groups after return-to-sport (4 of 29 subjects had re-injuries). Greater cranio-caudal length of injury, as measured on MRI before the start of rehabilitation, was positively correlated with longer return-to-sport time. At the time of return-to-sport, although all subjects showed a near complete resolution of pain and return of muscle strength, no subject showed complete resolution of injury as assessed on MRI.

#### **CONCLUSIONS:**

The 2 rehabilitation programs employed in this study yielded similar results with respect to hamstring muscle recovery and function at the time of return-to-sport. Evidence of continuing muscular healing is present after completion of rehabilitation, despite physical strength and function appearing normal on clinical exam.

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

Therapy, Level 1b. J Orthop Sports Phys Ther, Epub 13 March 2013.

doi:10.2519/jospt.2013.4452.

PMID: 23485730

## Shoulder/rotator cuff/exercise

Eur J Phys Rehabil Med. 2013 Mar 13. [Epub ahead of print]

### **Exercise therapy is evidence-based treatment of shoulder impingement syndrome - Current practice or recommendation only.**

Ylinen J, Vuorenmaa M, Paloneva J, Kiviranta I, Kautiainen H, Oikari M, Häkkinen A.

#### **Source**

Department of Physical and Rehabilitation Medicine Jyväskylä Central Hospital, Jyväskylä, Finland - jari.ylinen@ksshp.fi.

#### **Abstract**

**Background:** Subacromial impingement syndrome is the most common indication for shoulder operation. However, exercise therapy for the conservative treatment is recommended in the first instance.

**Aim:** To evaluate the implementation of exercise therapy in impingement syndrome.

**Design:** Retrospective study using structured postal questionnaire and data collected from hospital archive. **Methods:** A total of 104 consecutive patients who had undergone shoulder surgery due to impingement syndrome. Patients were asked about therapy modalities that they had received before and after the operation as well as pain (VAS) and functional impairment (ASES) at one-year follow-up.

**Results:** Before surgery 49% of patients had not received advice for shoulder muscle exercises. After operation all patients had received mobility exercises, but one quarter of patients still reported that they had not received instructions about shoulder strength exercises. At the follow-up the means of the ASES index was 85 and use of NSAID had decreased by 75%. However, 15% of patients had moderate functional impairment (ASES under 60).

**Conclusion:** About half of patients reported that they had not received advice for rotator cuff exercise therapy before surgery even though with it surgery would probably have been avoided in many cases. Although symptoms in most patients had decreased after operation, several patients still suffered from pain and decreased function. Still several patients had not received advice for shoulder strengthening exercises that are important to recovery.

**Clinical Rehabilitation Impact:** The adherence to the current recommendations about exercise therapy is insufficient in clinical practice. Thus we recommend that it should be monitored in all institutions in which shoulder pain is treated.

PMID: 23480979

## Shoulder/rotator cuff/exercise

J Shoulder Elbow Surg. 2013 Mar 26. pii: S1058-2746(13)00083-9. doi: 10.1016/j.jse.2013.01.026. [Epub ahead of print]

### **Effectiveness of physical therapy in treating atraumatic full-thickness rotator cuff tears: a multicenter prospective cohort study.**

Kuhn JE, Dunn WR, Sanders R, An Q, Baumgarten KM, Bishop JY, Brophy RH, Carey JL, Holloway BG, Jones GL, Ma CB, Marx RG, McCarty EC, Poddar SK, Smith MV, Spencer EE, Vidal AF, Wolf BR, Wright RW; MOON Shoulder Group.

#### **Source**

MOON Shoulder Group, Nashville, TN, USA. Electronic address: j.kuhn@vanderbilt.edu.

#### **Abstract**

##### **PURPOSE:**

To assess the effectiveness of a specific nonoperative physical therapy program in treating atraumatic full-thickness rotator cuff tears using a multicenter prospective cohort study design.

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

Patients with atraumatic full-thickness rotator cuff tears who consented to enroll provided data via questionnaire on demographics, symptom characteristics, comorbidities, willingness to undergo surgery, and patient-related outcome assessments (Short Form 12 score, American Shoulder and Elbow Surgeons score, Western Ontario Rotator Cuff score, Single Assessment Numeric Evaluation score, and Shoulder Activity Scale). Physicians recorded physical examination and imaging data. Patients began a physical therapy program developed from a systematic review of the literature and returned for evaluation at 6 and 12 weeks. At those visits, patients could choose 1 of 3 courses: (1) cured (no formal follow-up scheduled), (2) improved (continue therapy with scheduled reassessment in 6 weeks), or (3) no better (surgery offered). Patients were contacted by telephone at 1 and 2 years to determine whether they had undergone surgery since their last visit. A Wilcoxon signed rank test with continuity correction was used to compare initial, 6-week, and 12-week outcome scores.

##### **RESULTS:**

The cohort consists of 452 patients. Patient-reported outcomes improved significantly at 6 and 12 weeks. Patients elected to undergo surgery less than 25% of the time. Patients who decided to have surgery generally did so between 6 and 12 weeks, and few had surgery between 3 and 24 months.

##### **CONCLUSION:**

Nonoperative treatment using this physical therapy protocol is effective for treating atraumatic full-thickness rotator cuff tears in approximately 75% of patients followed up for 2 years.

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PMID: 23540577

## Meniscus/PT/Ex

J Orthop Traumatol. 2013 Mar 27. [Epub ahead of print]

### **Role of nonoperative treatment in managing degenerative tears of the medial meniscus posterior root.**

Neogi DS, Kumar A, Rijal L, Yadav CS, Jaiman A, Nag HL.

#### **Source**

Department of Orthopaedics, All India Institute of Medical Sciences, Ansari Nagar, New Delhi, 110029, India.

#### **Abstract**

##### **BACKGROUND:**

Tears of the medial meniscus posterior root can lead to progressive arthritis, and its management has no consensus. The aim of our study was to evaluate the effect of supervised exercise therapy on patients with medial meniscus posterior root tears.

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

Between January 2005 and May 2007, 37 patients with this tear verified by magnetic resonance imaging (MRI) and osteoarthritis grade 1-2 by radiographic examination were treated by a short course of analgesics daily for up to 6 weeks and then as required during follow-up, as well as a 12-week supervised exercise program followed by a home exercise program. Final analysis was performed for 33 patients, average age 55.8 (range 50-62) years and average follow-up of 35 (range 26-49) months. Patients were followed up at 3, 6, and 12 months and yearly thereafter using the Lysholm Knee Scoring Scale, Tegner Activity Scale (TAS), and visual analog scale (VAS). The analysis was performed using one-way analysis of variance (ANOVA) and Pearson's correlation coefficient to determine the relationship between Lysholm score and body mass index (BMI).

##### **RESULTS:**

Patients showed an improvement in Lysholm score, TAS, and VAS, which reached maximum in 6 months and later was accompanied by a decline. However, scores at the final follow-up were significantly better than the pretherapy scores. There was also a progression in arthritis as per Kellgren and Lawrence radiographic classification from median 1 preintervention to median 2 at the final follow-up. A correlation between BMI and Lysholm scores was seen ( $r = 0.47$ ).

##### **CONCLUSION:**

Supervised physical therapy with a short course of analgesics followed by a home-based program results in symptomatic and functional improvement over a short-term follow-up; however, osteoarthritis progression continues and is related to BMI.

PMID: 23532300

## Serrates Anterior/scapula winging/exercise

*J Electromyogr Kinesiol.* 2013 Apr;23(2):462-8. doi: 10.1016/j.jelekin.2012.11.013. Epub 2013 Jan 16.

### **Effect of isometric horizontal abduction on pectoralis major and serratus anterior EMG activity during three exercises in subjects with scapular winging.**

Park KM, Cynn HS, Yi CH, Kwon OY.

#### **Source**

Department of Physical Therapy, The Graduate School, Yonsei University, 1 Yonseidae-gil, Wonju, Gangwon-do, South Korea. kyungmi87@hanmail.net

#### **Abstract**

The aim of this study was to determine the effect of isometric horizontal abduction using Thera-Band during three exercises (forward flexion, scaption, and wall push-up plus) in subjects with scapular winging by investigating the electromyographic (EMG) amplitude of the pectoralis major, serratus anterior and the pectoralis major/serratus anterior activity ratio.

Twenty-four males with scapular winging participated in this study. The subjects performed the forward flexion, scaption, and wall push-up plus with and without isometric horizontal abduction using Thera-Band. Surface EMG was used to collect the EMG data of the pectoralis major and serratus anterior during the three exercises. Two-way repeated analyses of variance with two within-subject factors (isometric horizontal abduction condition and exercise type) were used to determine the statistical significance of pectoralis major and serratus anterior EMG activity and the pectoralis major/serratus anterior EMG activity ratio. Pectoralis major EMG activity was significantly lower during forward flexion and wall push-up plus with isometric horizontal abduction, and serratus anterior EMG activity was significantly greater with isometric horizontal abduction. Additionally, the pectoralis major/serratus anterior activity ratio was significantly lower during the forward flexion and wall push-up plus with isometric horizontal abduction.

The results of this study suggest that isometric horizontal abduction using Thera-Band can be used as an effective method to facilitate the serratus anterior activity and to reduce excessive pectoralis major activity during exercises for activating serratus anterior.

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PMID: 23332682

## Manipulation/supraspinal structures

### [Supraspinal structures may be associated with hypoalgesia following thrust manipulation to the spine: a review of the literature.](#)

Sparks, Cheryl; Cleland, Joshua; Elliott, James; Strubhar, Andrew.  
Physical Therapy Reviews, April 2013

#### **Abstract:**

**Background:** Thrust manipulation to the spine has been shown to be an effective treatment for pain reduction associated with musculoskeletal disorders. However, the mechanisms of action tied to this intervention have yet to be sufficiently explained.

**Objectives:** This manuscript reviews the literature related to supraspinal mechanisms associated with pain inhibition, which may also be associated with hypoalgesia following spinal manipulation. Such information adds to the current body of evidence that has demonstrated centrally mediated hypoalgesic effects following manipulation to be influenced by both dorsal horn inhibition and patient expectation.

**Major findings:** Areas believed to be responsible for processing pain include the amygdala, anterior cingulate, thalamus, insula, cerebellum, primary and secondary somatosensory cortices, periaqueductal grey, or dorsal horn. The periaqueductal grey receives information from spinoreticular and spinomesencephalic pathways in the spinal cord, as well as descending information from the amygdala and cortex. The inhibition of sensory stimuli in the dorsal horn may result in decreased projection of ascending information to the periaqueductal grey and modulation from higher-level cortical structures. Neuroimaging research in animals has demonstrated activation of such cortical structures in response to pain with subsequent decreased activation of these areas following joint mobilization. Researchers have yet to identify supraspinal structures associated with spinal manipulation in human subjects.

**Conclusions:** Future investigation should strive to identify supraspinal structures activated in human subjects following thrust manipulation. The identification of cortical and subcortical structures associated with hypoalgesia following spinal manipulation may influence the acceptance and use of this intervention with patients when indicated

## Core Muscle/exercise

J Strength Cond Res. 2013 Mar 28. [Epub ahead of print]

### **Systematic review of core muscle activity during physical fitness exercises.**

Martuscello JM, Nuzzo JL, Ashley CD, Campbell BI, Orriola JJ, Mayer JM.

#### **Source**

1 School of Physical Education & Exercise Science, College of Education, University of South Florida, Tampa, FL, US 2 School of Physical Therapy & Rehabilitation Sciences, Morsani College of Medicine, University of South Florida, Tampa, FL, US 3 Shimberg Health Sciences Library, Morsani College of Medicine, University of South Florida, Tampa, FL, US.

#### **Abstract**

A consensus has not been reached among strength and conditioning specialists regarding what physical fitness exercises are most effective to stimulate activity of the core muscles. Thus, the purpose of this paper was to systematically review the literature on the electromyographic (EMG) activity of three core muscles (lumbar multifidus, transverse abdominis, quadratus lumborum) during physical fitness exercises in healthy adults. CINAHL, Cochrane Central Register of Controlled Trials, EMBASE, PubMed, SPORTdiscus, and Web of Science databases were searched for relevant articles using a search strategy designed by the investigators. Seventeen studies enrolling 252 participants met the review's inclusion/exclusion criteria. Physical fitness exercises were partitioned into five major types: traditional core, core stability, ball/device, free weight, and non-core free weight. Strength of evidence was assessed and summarized for comparisons among exercise types. The major findings of this review with moderate levels of evidence indicate that lumbar multifidus EMG activity is greater during free weight exercises compared with ball/device exercises, and similar during core stability and ball/device exercises. Transverse abdominis EMG activity is similar during core stability and ball/device exercises. No studies were uncovered for quadratus lumborum EMG activity during physical fitness exercises. The available evidence suggests that strength and conditioning specialists should focus on implementing multi-joint free weight exercises, rather than core-specific exercises, in order to adequately train the core muscles in their athletes and clients.

PMID: 23542879

**Natural course of acute neck and low back pain in the general population: The HUNT study**

□

**Pain, 04/08/2013 Clinical Article**

Vasseljen O et al. –

In this prospective cohort study the authors aimed to describe the natural course of acute neck and low back pain in a general population of Norway. Only one in five sought health care for their complaints. Still, the course of pain was comparable to effect sizes reported in interventional studies. This study thus contributes natural course reference data for comparisons of pain outcome in clinical trials and practice.

**Methods**

- The authors screened 9 056 subjects aged 20–67 years who participated in a general health survey for a new episode of neck or low back pain the previous month.
- The screening identified 219 subjects who formed the cohort for this study.
- Pain intensity was reported on a numeric rating scale (0–10) at 1, 2, 3, 6, and 12 months after start of the new pain episode.
- The course of pain was described for neck and low back pain, different baseline pain levels, age groups, and number of pain sites at baseline.
- Use of medication and health care was described and associations between pain intensity and seeking health were estimated.

**Results**

Pain declined rapidly within one month after a new pain episode with a reduction of 0.91 (95% CI; 0.50 to 1.32) for neck pain and 1.40 (95% CI; 0.82 to 1.99) for low back pain with little change thereafter.

However, pain remained unchanged over the follow-up year for those with equal pain in the neck and low back areas at baseline and for those reporting four or more pain sites at baseline

## Headaches/MSG

*J Headache Pain*. 2013 Jan 24;14(1):2. doi: 10.1186/1129-2377-14-2.

### **Headache and mechanical sensitization of human pericranial muscles after repeated intake of monosodium glutamate (MSG).**

Shimada A, Cairns BE, Vad N, Ulriksen K, Pedersen AM, Svensson P, Baad-Hansen L.

#### **Source**

Section of Clinical Oral Physiology, Department of Dentistry, Faculty of Health Sciences, Aarhus University, Vennelyst Boulevard 9, Aarhus C 8000, Denmark. akiko.shimada@odontologi.au.dk.

#### **Abstract**

##### **BACKGROUND:**

A single intake of monosodium glutamate (MSG) may cause headache and increased muscle sensitivity. We conducted a double-blinded, placebo-controlled, crossover study to examine the effect of repeated MSG intake on spontaneous pain, mechanical sensitivity of masticatory muscles, side effects, and blood pressure.

##### **METHODS:**

Fourteen healthy subjects participated in 5 daily sessions for one week of MSG intake (150 mg/kg) or placebo (24 mg/kg NaCl) (randomized, double-blinded). Spontaneous pain, pressure pain thresholds and tolerance levels for the masseter and temporalis muscles, side effects, and blood pressure were evaluated before and 15, 30, and 50 min after MSG intake. Whole saliva samples were taken before and 30 min after MSG intake to assess glutamate concentrations.

##### **RESULTS:**

Headache occurred in 8/14 subjects during MSG and 2/14 during placebo ( $P = 0.041$ ). Salivary glutamate concentrations on Day 5 were elevated significantly ( $P < 0.05$ ). Pressure pain thresholds in masseter muscle were reduced by MSG on Day 2 and 5 ( $P < 0.05$ ). Blood pressure was significantly elevated after MSG ( $P < 0.040$ ).

##### **CONCLUSION:**

In conclusion, MSG induced mechanical sensitization in masseter muscle and adverse effects such as headache and short-lasting blood pressure elevation for which tolerance did not develop over 5 days of MSG intake.

PMID: 23565943

## LBP/Irritable Bowel syndrome

Neurogastroenterol Motil. 2013 Apr 2. doi: 10.1111/nmo.12123. [Epub ahead of print]

### **Changes in the modulation of spinal pain processing are related to severity in irritable bowel syndrome.**

Bouhassira D, Moisset X, Jouet P, Duboc H, Coffin B, Sabate JM.

#### **Source**

U-987, INSERM, AP-HP, Hôpital Ambroise Paré, Boulogne-Billancourt, France; Versailles-Saint-Quentin University, Versailles, France.

#### **Abstract**

##### **BACKGROUND:**

In irritable bowel syndrome (IBS) patients can be divided in two groups according to inhibition or facilitation of the RIII nociceptive spinal reflex induced by rectal distension. We further investigated the differences in pain processes in these two groups and their relationship to clinical symptoms.

##### **METHODS:**

This study included 10 female IBS-C patients with facilitation (Group F) and 10 patients with inhibition (Group I) of the RIII reflex recorded on the left lower limb during slow-ramp rectal distension, and 11 healthy female volunteers. Diffuse noxious inhibitory control (DNIC)-induced inhibition was assessed by measuring the effects of noxious cold stimulation of the right hand on the RIII reflex and the concomitant sensation of pain. Functional magnetic resonance imaging (fMRI) was performed to compare the changes in brain activity induced by painful and non painful rectal distension. Irritable bowel syndrome symptom severity, mood, anxiety, and catastrophizing were also systematically assessed.

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

Unlike the patients of Group I and healthy volunteers, Group F patients displayed no inhibition of the RIII reflex or of concomitant pain sensation during immersion of the hand in ice-cold water. The reduction of the inhibition induced by heterotopic noxious stimuli was directly correlated with the severity of IBS symptoms, but not with psychological symptoms. The fMRI study showed that non-painful and painful rectal distension induced similar changes in brain activity in the two groups of patients.

##### **CONCLUSION & INFERENCES:**

Alterations of the modulation of spinal pain processing in IBS correlates with symptom severity but not with psychological factors or brain activity.

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PMID: 23551988

## Headache/GI problems

*J Pediatr.* 2013 Mar 22. pii: S0022-3476(13)00240-0. doi: 10.1016/j.jpeds.2013.02.033. [Epub ahead of print]

### **Prevalence of Pain-Predominant Functional Gastrointestinal Disorders and Somatic Symptoms in Patients with Anxiety or Depressive Disorders.**

Yacob D, Di Lorenzo C, Bridge JA, Rosenstein PF, Onorato M, Bravender T, Campo JV.

#### **Source**

Division of Pediatric Gastroenterology, Nationwide Children's Hospital and The Ohio State University, Columbus, OH. Electronic address: des.yacob@nationwidechildrens.org.

#### **Abstract**

##### **OBJECTIVE:**

To determine whether children with symptoms of internalizing psychiatric disorders have a greater prevalence of pain-predominant functional gastrointestinal disorders (FGIDs) and migraine-like headaches.

##### **STUDY DESIGN:**

Children and adolescents aged 6-18 years were recruited from a behavioral health center (n = 31) and a primary care center (n = 36). Subjects completed Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-based symptom inventory questionnaires to screen for internalizing psychiatric disorders, the Questionnaire on Pediatric Gastrointestinal Symptoms, and a somatic distress assessment interview.

##### **RESULTS:**

Thirty-three subjects (19 of 31 from the behavioral health center and 14 of 36 from the primary care center) screened positive for symptoms of anxiety or depressive disorders. The remainder screened negative and served as controls. Pain-predominant FGIDs were more common in the group with symptoms of anxiety or depression compared with controls (prevalence, 51.5% vs 8.8%;  $P = .0002$ ). Migraine headaches occurred in 57.6% of the subjects with internalizing psychiatric disorders vs 23.5% of the control group ( $P = .006$ ). The prevalence of functional constipation did not differ significantly between the 2 groups. The data remained essentially unchanged when analyzed within each center of recruitment.

##### **CONCLUSION:**

Youths with anxiety or depressive symptoms are more likely to suffer from pain-predominant FGIDs and migraine-like headaches, but not from functional constipation. The lack of an association between functional constipation and internalizing psychiatric symptoms suggests that FGIDs associated with pain may bear a specific relationship to emotional disorders.

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PMID: 23522860

## Pubic symphysis/adductor

Br J Sports Med. 2013 Apr 5. [Epub ahead of print]

### **Radiological findings in symphyseal and adductor-related groin pain in athletes: a critical review of the literature.**

Branci S, Thorborg K, Nielsen MB, Hölmich P.

#### **Source**

Department of Orthopaedic Surgery, Arthroscopic Center Amager, Copenhagen University Hospital, Hvidovre, Denmark.

#### **Abstract**

Long-standing symphyseal and adductor-related groin pain is a common problem for many athletes, and requires a multidisciplinary approach. Radiological evaluation of symptomatic individuals is a cornerstone in the diagnostic workup, and should be based on precise and reliable diagnostic terms and imaging techniques. The authors performed a review of the existing original evidence-based radiological literature involving radiography, ultrasonography and MRI in athletes with long-standing symphyseal and adductor-related groin pain. Our search yielded 17 original articles, of which 12 were dedicated to MRI, four to radiography and one to ultrasonography. Four main radiological findings seem to consistently appear: degenerative changes at the pubic symphyseal joint, pathology at the adductor muscle insertions, pubic bone marrow oedema and the secondary cleft sign. However, the existing diagnostic terminology is confusing, and the interpretation of radiological findings would benefit from imaging studies using a more systematic approach.

PMID: 23403531

## Compartment syndrome/fasciotomies

J Orthop Surg Res. 2013 Apr 5;8(1):6. [Epub ahead of print]

### **Changes in leg pain after bilateral fasciotomy to treat chronic compartment syndrome: a case series study.**

Orlin JR, Oen J, Andersen JR.

#### **Abstract**

#### **BACKGROUND:**

Intracompartmental pressure (ICP) as the diagnostic gold standard in the management of chronic compartment syndrome (CCS) is debated. We present a diagnostic protocol in which the decision to operate can be based upon clinical findings alone. The aim of this study was to examine whether patients who underwent surgery for CCS based on clinical findings experienced significant long-term pain relief.

#### **METHODS:**

A standardized clinical examination, including skin sensitivity, was performed in patients with bilateral leg pain and/or cramps. Before and after a symptom-provoking step test, ICPs were measured. The primary outcome was self-reported leg pain measured on a visual analogue scale. Secondary outcomes were satisfaction with the treatment result and health-related quality of life (HRQL) measured with the SF-8 questionnaire. Postoperative data were collected after 2 years.

#### **RESULTS:**

Follow-up was completed for 37 of 40 patients. ICP was increased in 80.5% of the compartments examined before surgery, but did not correlate with the degree of leg pain. The remaining compartments were diagnosed as CCS based on clinical findings, despite ICPs below the threshold. Leg cramps occurred in 32 of 37 (86.5%) patients during physical activity and at night. Leg pain improved from a score of 8.0 +/- 1.5 to 2.3 +/- 2.1,  $P < 0.001$ . Satisfaction with the treatment result was reported by 81.1% of the patients, accompanied by normalized HRQL.

#### **CONCLUSIONS:**

The diagnostic protocol led to a fasciotomy in all compartments of both legs, which was associated with substantial and sustained relief of leg pain, improved HRQL, and patient satisfaction.

PMID: 23561303

## Scapula/Rotation/impingement

### Clinical Measurement of Scapular Upward Rotation in Response to Acute Subacromial Pain

Craig A. Wassinger, Gisela Sole, Hamish Osborne

DOI: 10.2519/jospt.2013.4276

**STUDY DESIGN:** Block-counterbalanced, repeated-measures crossover study.

**OBJECTIVES:** To assess scapular upward rotation positional adaptations to experimentally induced subacromial pain.

**BACKGROUND:** Existing subacromial pathology is often related to altered scapular kinematics during humeral elevation, such as decreased upward rotation and posterior tilting. These changes have the potential to limit subacromial space and mechanically impinge subacromial structures. Yet, it is unknown whether these changes are the cause or result of injury and what the acute effects of subacromial pain on scapular upward rotation may be.

**METHODS:** Subacromial pain was induced via hypertonic saline injection in 20 participants, aged 18 to 31 years. Scapular upward rotation was measured with a digital inclinometer at rest and at 30°, 60°, 90°, and 120° of humeral elevation during a painful condition and a pain-free condition. Repeated-measures analyses of variance were conducted for scapular upward rotation position, based on condition (pain or control) and humeral position. Post hoc testing was conducted with paired t tests as appropriate.

**RESULTS:** Scapular upward rotation during the pain condition was significantly increased (range of average increase, 3.5°-7.7°) compared to the control condition at all angles of humeral elevation tested.

**CONCLUSION:** Acute subacromial pain elicited an increase in scapular upward rotation at all angles of humeral elevation tested. This adaptation to acute experimental pain may provide protective compensation to subacromial structures during humeral elevation.

*J Orthop Sports Phys Ther* 2013;43(4):199-203. Epub 14 January 2013.

doi:10.2519/jospt.2013.4276

## Glut max contraction

### Method for Assessing Brain Changes Associated With Gluteus Maximus Activation

Beth E. Fisher, Ya-Yun Lee, Erica A. Pitsch, Brian Moore, Anna Southam, Timothy D. Faw, Christopher M. Powers

DOI: 10.2519/jospt.2013.4188

**STUDY DESIGN:** Reliability study.

**OBJECTIVES:** To determine the feasibility and reliability of using transcranial magnetic stimulation (TMS) to assess corticomotor excitability (CE) of the gluteus maximus.

**BACKGROUND:** Sport-specific skill training targeting greater utilization of the gluteus maximus has been proposed as a method to reduce the incidence of noncontact knee injuries. The use of TMS to assess changes in CE may help to determine training-induced central mechanisms associated with gluteus maximus activation.

**METHODS:** Within- and between-day reliability was measured in 10 healthy adults. The CE was measured by stimulating the gluteus maximus at 120% and 150% of motor threshold, while subjects performed a double-leg bridge. An intraclass correlation coefficient (model 2,1), standard error of measurement, and minimal detectable change were calculated to determine the within- and between-day reliability for the following TMS variables: peak-to-peak motor-evoked potential (MEP) amplitudes, cortical silent period, and MEP latency.

**RESULTS:** It is feasible to measure the CE of the gluteus maximus with TMS. The intraclass correlation coefficients for all TMS outcome measures ranged from 0.73 to 0.97. The ranges of minimal detectable change, with respect to mean values for each TMS variable, were larger for MEP amplitude (304.7-585.4  $\mu$ V) compared to those for cortical silent period duration (25.3-40.8 milliseconds) and MEP latency (1.1-2.1 milliseconds).

**CONCLUSION:** The present study demonstrated a feasible method for using TMS to measure CE of the gluteus maximus. Small minimal detectable change values for the cortical silent period and MEP latency provide a reference for future studies.

*J Orthop Sports Phys Ther 2013;43(4):214-221. Epub 13 March 2013.*

*doi:10.2519/jospt.2013.4188*

**KEY WORDS:** corticomotor excitability, reliability, transcranial magnetic stimulation

## **LBP/Stem cells**

### **Advances in biological techniques for treatment of lumbar discogenic pain**

Petersohn JD

Successful use of intradiscal autologous and mesenchymal stem cells has been demonstrated for in animal models, but human experience is limited. Clinical considerations and risks of these treatments are discussed.

- Treatment of lumbar discogenic pain is based upon restoration of mechanical function and suppression of nociception within the intervertebral disc.
- The biophysical and pathologic basis of disc injury is reviewed with discussion of treatment modalities.
- Ablative intradiscal ethanol and restorative intradiscal fibrin appear promising.
- Intradiscal platelet-rich plasma is tantalizing, but unproven.
- Biochemical modification of anabolic-catabolic balance by intradiscal administration of growth factors including BMP-7 and GDF-5 in clinical trials, as well as multiple investigational pharmacologic moieties, is discussed.

Read more: <http://www.mdlinx.com/pain-management/news-article.cfm/4586064/discogenic-pain-lumbar-pain-intradiscal-chondrocytes#ixzz2SAGBUZvz>

## **Fibromyalgia/cryotherapy**

### **Effects of 15 consecutive cryotherapy sessions on the clinical output of fibromyalgic patients**

**Clinical Rheumatology, 05/02/2013 Clinical Article**

Bettoni L et al.

Fibromyalgia is a chronic widespread pain disorder in which, the neurogenic origin of the pain, featured by allodynia and hyperalgesia, results from an imbalance in the levels of neurotransmitters and consequently of the peripheral pro- and anti-inflammatory mediators. Whole body cryotherapy is a peculiar physical therapy known to relieve pain and inflammatory symptoms characteristics of rheumatic diseases, through the regulation of the cytokine expression. The aim of this study was to qualitatively evaluate the effects of cryotherapy on the clinical output of fibromyalgic patients. The authors speculate that this improvement is due to the known direct effect of cryotherapy on the balance between pro- and anti-inflammatory mediators having a recognized role in the modulation of pain.

#### **Methods**

- A total of 100 fibromyalgic patients (age range 17–70 years) were observed; 50 subjects were addressed to cryotherapy, while the second group (n=50) did not underwent to the cryotherapeutic treatment.
- All subjects kept the prescribed pharmacological therapy during the study (analgesic and antioxidants).
- The referred health status pre- and post-observation was evaluated with the following scales: Visual Analogue Scale, Short Form-36, Global Health Status and Fatigue Severity Scale.

#### **Results**

- Fibromyalgic patients treated with cryotherapy reported a more pronounced improvement of the quality of life, in comparison with the non-cryo treated fibromyalgic subjects, as indicated by the scores of the qualitative indexes and sub-indexes, that are widely recognized tools to assess the overall health status and the effect of the treatments
- Read more: <http://www.mdlinx.com/pain-management/news-article.cfm/4602384/fibromyalgia-pain-quality-of-life-whole#ixzz2SAGbhVVe>

[shoulder/Impingement/cortisone/exercise](#)

[Rheumatology \(Oxford\)](#). 2013 Apr 28. [Epub ahead of print]

**Cost-effectiveness of exercise therapy after corticosteroid injection for moderate to severe shoulder pain due to subacromial impingement syndrome: a trial-based analysis.**

[Jowett S](#), [Crawshaw DP](#), [Helliwell PS](#), [Hensor EM](#), [Hay EM](#), [Conaghan PG](#).

**Source**

Health Economics Unit, School of Health and Population Sciences, University of Birmingham, Birmingham, Leeds Musculoskeletal & Rehabilitation Service, Leeds Community Healthcare NHS Trust, Leeds, Division of Musculoskeletal Disease, Leeds Institute of Molecular Medicine, University of Leeds, Leeds, NIHR Leeds Musculoskeletal Biomedical Research Unit, Leeds and Arthritis Research UK Primary Care Research Centre, Keele University, Keele, Staffordshire, UK.

**Abstract**

**Objective.** To perform a cost-effectiveness analysis of subacromial corticosteroid injection combined with exercise compared with exercise alone in patients with moderate to severe shoulder pain from subacromial impingement syndrome.

**Methods.** A within-trial cost-effectiveness analysis with 232 patients randomized to physiotherapy-led injection combined with exercise (n = 115) or exercise alone (n = 117). The analysis was from a health care perspective with 24-week follow-up. Resource use information was collected from all patients on interventions, medication, primary and secondary care contacts, private health care use and over-the-counter purchases. The measure of outcome was quality-adjusted life years (QALYs), calculated from EQ-5D responses at baseline and three further time points. An incremental cost-effectiveness analysis was conducted

**.Results.** Mean per patient NHS costs (£255 vs £297) and overall health care costs (£261 vs £318) were lower in the injection plus exercise arm, but this difference was not statistically significant. Total QALYs gained were very similar in the two trial arms (0.3514 vs 0.3494 QALYs), although slightly higher in the injection plus exercise arm, indicating that injection plus exercise may be the dominant treatment option. At a willingness to pay of £20,000 per additional QALY gained, there was a 61% probability that injection plus exercise was the most cost-effective option.

**Conclusion.** Injection plus exercise delivered by therapists may be a cost-effective use of resources compared with exercise alone and lead to lower health care costs and less time off work. Trial registration: International Standard Randomised Controlled Trial Number Register, <http://www.controlled-trials.com/isrctn/>, ISRCT 25817033.

PMID:23630367

## Alcohol/Headaches

[Pain Med.](#) 2013 Apr 24. doi: 10.1111/pme.12127. [Epub ahead of print]

### **Alcoholic Drinks as Triggers in Primary Headaches.**

[Panconesi A](#), [Franchini M](#), [Bartolozzi ML](#), [Mugnai S](#), [Guidi L](#).

#### **Source**

Headache Centre, Department of Neurology, San Giuseppe Hospital, Empoli, FI, Italy.

#### **Abstract**

**OBJECTIVE.:** This project aims to investigate the role of alcoholic drinks (ADs) as triggers for primary headaches.

**METHODS.:** Patients followed in the Headache Centre and presenting with migraine without aura, migraine with aura (MA), chronic migraine (CM), and tension-type headache (TH) were asked if their headache was precipitated by AD and also about their alcohol habits. Individual characteristics and drink habits were evaluated within two binary logistic models.

**RESULTS.:** About one half (49.7%) of patients were abstainers, 17.6% were habitual consumers, and 32.5% were occasional consumers. Out of 448 patients, only 22 (4.9%), all with migraine, reported AD as a trigger factor. None of 44 patients with MA and none of 47 patients with TH reported AD as a trigger factor. Among those patients with migraine who consume AD, only 8% reported that AD can precipitate their headache. Multivariate analyses showed that AD use, both occasional and habitual, is unrelated to TH. Moreover, analysis performed among migraine patients, points out that occasional and habitual drinkers have a lower risk of presenting with CM than abstainers, although statistical significance occurred only among occasional drinkers. Only 3% of migraine patients who abstain from AD reported that they do not consume alcohol because it triggers their headache.

**CONCLUSION.:** Our study shows that AD acts as headache triggers in a small percentage of migraine patients. Differing from some prior studies, our data suggest that AD do not trigger MA and TH attacks. Moreover, the percentage of abstainers in our sample is higher compared with that reported in general population surveys.

Wiley Periodicals, Inc.

PMID:23614946

## Pelvic floor pain/MRI

### Chronic Anal and Perianal Pain Resolved With MRI

American Journal of Roentgenology, 04/30/2013 Clinical Article

Dwarkasing RS et al.

The purpose of this study was to assess the diagnostic value of anorectal MRI in the care of patients with chronic anal and perianal pain but without findings of abnormalities in the clinical workup. In 39% of patients, MRI showed abnormalities that were clinically confirmed as the final diagnosis. Surgical treatment will especially benefit patients with suppurative lesions, resulting in relief of pain.

#### Methods

- Patients referred from a tertiary department of colorectal surgery to the MRI unit with clinically occult chronic anal and perianal pain were included.
- MRI of the anorectum was performed with an endoanal or pelvic phased-array coil.
- The images from all examinations were read by two radiologists.
- MRI findings were correlated with clinical follow-up data.

#### Results

- The study group (103 patients) was stratified into patients with no history of anorectal disease (n = 60) and those who had a history of surgery for anorectal disease (n = 43).
- MRI findings suggested the final diagnoses in 40 patients (39%).
- These diagnoses were 28 cases of suppurative lesions (27%), 11 cases of painful scarring of the anus (11%), and one case of metastasis to the sacrum (1%).
- Suppurative lesions were surgically proved with marked relief of pain after surgery.
- In the other patients the final diagnoses were 37 cases of levator ani syndrome (36%) and 26 cases of unspecified functional anorectal pain (25%).
- No MRI abnormalities were found in 33 of the patients with levator ani syndrome and 26 of the patients with unspecified anorectal pain.
- The two readers had very good agreement (k = 0.92).
- The patients with a history of anorectal disease had significantly more MRI findings of abnormalities (60%) than did patients without a history of anorectal disease (23%).
- The positive predictive value of MRI was 91%, and the negative predictive value was 100%.

Read more: <http://www.mdlinx.com/pain-management/news-article.cfm/4593985/anal-pain-anus-chronic-pain-mri#ixzz2SANQAQpJ>

## Alzheimer's disease/exercise

[JAMA Intern Med.](#) 2013 Apr 15:1-8. doi: 10.1001/jamainternmed.2013.359. [Epub ahead of print]

### **Effects of the Finnish Alzheimer Disease Exercise Trial (FINALEX): A Randomized Controlled Trial.**

[Pitkälä KH](#), [Pöysti MM](#), [Laakkonen ML](#), [Tilvis RS](#), [Savikko N](#), [Kautiainen H](#), [Strandberg TE](#).

#### **Abstract**

**IMPORTANCE** Few rigorous clinical trials have investigated the effectiveness of exercise on the physical functioning of patients with Alzheimer disease (AD).

**OBJECTIVES** To investigate the effects of intense and long-term exercise on the physical functioning and mobility of home-dwelling patients with AD and to explore its effects on the use and costs of health and social services. **DESIGN** A randomized controlled trial.

**SETTING AND PARTICIPANTS** A total of 210 home-dwelling patients with AD living with their spousal caregiver.

**INTERVENTIONS** The 3 trial arms included (1) group-based exercise (GE; 4-hour sessions with approximately 1-hour training) and (2) tailored home-based exercise (HE; 1-hour training), both twice a week for 1 year, and (3) a control group (CG) receiving the usual community care. **MAIN**

**OUTCOME MEASURES** The Functional Independence Measure (FIM), the Short Physical Performance Battery, and information on the use and costs of social and health care services.

**RESULTS** All groups deteriorated in functioning during the year after randomization, but deterioration was significantly faster in the CG than in the HE or GE group at 6 ( $P = .003$ ) and 12 ( $P = .015$ ) months. The FIM changes at 12 months were -7.1 (95% CI, -3.7 to -10.5), -10.3 (95% CI, -6.7 to -13.9), and -14.4 (95% CI, -10.9 to -18.0) in the HE group, GE group, and CG, respectively. The HE and GE groups had significantly fewer falls than the CG during the follow-up year. The total costs of health and social services for the HE patient-caregiver dyads (in US dollars per dyad per year) were \$25 112 (95% CI, \$17 642 to \$32 581) ( $P = .13$  for comparison with the CG), \$22 066 in the GE group (\$15 931 to \$28 199;  $P = .03$  vs CG), and \$34 121 (\$24 559 to \$43 681) in the CG.

**CONCLUSIONS AND RELEVANCE** An intensive and long-term exercise program had beneficial effects on the physical functioning of patients with AD without increasing the total costs of health and social services or causing any significant adverse effects. **TRIAL REGISTRATION** anzctr.org.au Identifier: ACTRN12608000037303.

PMID:23589097

## Neuropathic pain/Motor cortex

[Clin Neurophysiol](#). 2013 Apr;124(4):761-9. doi: 10.1016/j.clinph.2012.10.011. Epub 2012 Nov 11.

**Motor cortex stimulation modulates defective central beta rhythms in patients with neuropathic pain.**

[Reyns N](#), [Derambure P](#), [Duhamel A](#), [Bourriez JL](#), [Blond S](#), [Houdayer E](#).

**Source**

Department of Functional Neurosurgery, FRE 3291 CNRS, Université Lille Nord de France, France. nicolas.reyns@chru-lille.fr

**Abstract**

**OBJECTIVE:**

Motor cortex stimulation therapy (MCS) is increasingly used to control refractory neuropathic pain. Post-movement beta synchronization (PMBS) is defined as a sharp increase in beta-frequency electroencephalographic power following movement offset and may reflect sensorimotor cortex inhibition induced, at least in part, by cortical processing of movement-related sensory afferent inputs. PMBS pattern is then often altered in case of neuropathic pain. The main objective of the present study was to test the hypothesis that implanted MCS modulates PMBS in patients presenting with neuropathic pain.

**METHODS:**

Using a high-resolution, 128-electrode electroencephalographic system, we recorded and compared, before and during MCS, PMBS patterns during brisk, unilateral right and left index finger extension in 8 patients presenting with neuropathic pain.

**RESULTS:**

The pre-operative PMBS patterns were altered in all cases. MCS increased the spatial distribution and amplitude of PMBS in most of cases and restored maximum-intensity of PMBS contralateral to the painful body side. These modifications appeared significantly correlated with the analgesic effect of MCS.

**CONCLUSION:**

This study provides evidence of central beta rhythms neuromodulation induced by MCS.

**SIGNIFICANCE:**

The restoration by MCS of defective cortical inhibition in patients with neuropathic pain is evoked. ID:23151426

[Shoulder/AC joint/diagnostic accuracy](#)

**Shoulder pain in primary care: diagnostic accuracy of clinical examination tests for non-traumatic acromioclavicular joint pain.**

[Cadogan A](#), [McNair P](#), [Laslett M](#), [Hing W](#).

**BACKGROUND:**

Despite numerous methodological flaws in previous study designs and the lack of validation in primary care populations, clinical tests for identifying acromioclavicular joint (ACJ) pain are widely utilised without concern for such issues. The aim of this study was to estimate the diagnostic accuracy of traditional ACJ tests and to compare their accuracy with other clinical examination features for identifying a predominant ACJ pain source in a primary care cohort.

**METHODS:**

Consecutive patients with shoulder pain were recruited prospectively from primary health care clinics. Following a standardised clinical examination and diagnostic injection into the subacromial bursa, all participants received a fluoroscopically guided diagnostic block of 1% lidocaine hydrochloride (Xylocaine™) into the ACJ. Diagnostic accuracy statistics including sensitivity, specificity, predictive values, positive and negative likelihood ratios (LR+ and LR-) were calculated for traditional ACJ tests (Active Compression/O'Brien's test, cross-body adduction, localised ACJ tenderness and Hawkins-Kennedy test), and for individual and combinations of clinical examination variables that were associated with a positive anaesthetic response (PAR) ( $P \leq 0.05$ ) defined as 80% or more reduction in post-injection pain intensity during provocative clinical tests.

**RESULTS:**

Twenty two of 153 participants (14%) reported an 80% PAR. None of the traditional ACJ tests were associated with an 80% PAR ( $P < 0.05$ ) and combinations of traditional tests were not able to discriminate between a PAR and a negative anaesthetic response (AUC 0.507; 95% CI: 0.366, 0.647;  $P > 0.05$ ). Five clinical examination variables (repetitive mechanism of pain onset, no referred pain below the elbow, thickened or swollen ACJ, no symptom provocation during passive glenohumeral abduction and external rotation) were associated with an 80% PAR ( $P < 0.05$ ) and demonstrated an ability to accurately discriminate between an PAR and NAR (AUC 0.791; 95% CI 0.702, 0.880;  $P < 0.001$ ). Less than two positive clinical features resulted in 96% sensitivity (95% CI 0.78, 0.99) and a LR- 0.09 (95% CI 0.02, 0.41) and four positive clinical features resulted in 95% specificity (95% CI 0.90, 0.98) and a LR+ of 4.98 (95% CI 1.69, 13.84).

**CONCLUSIONS:**

In this cohort of primary care patients with predominantly subacute or chronic ACJ pain of non-traumatic onset, traditional ACJ tests were of limited diagnostic value. Combinations of other history and physical examination findings were able to more accurately identify injection-confirmed ACJ pain in this cohort. PMID:23634871

**Flank Pain/Tomography**

## **Adverse events are rare among adults 50 years of age and younger with flank pain when abdominal computed tomography is not clinically indicated according to the emergency physician**

Canadian Journal of Emergency Medicine, 05/03/2013 Clinical Article

Epstein N et al.

Many emergency physicians (EPs) order “confirmatory” abdominal computed tomography (CT) in young flank pain patients, despite a high clinical suspicion of renal colic and the risk of radiation exposure. The authors measured the adverse outcome rate among flank pain patients identified as not requiring abdominal CT by the EP on a data form, regardless of whether CT was eventually ordered. The secondary objective was to describe diagnoses other than renal colic identified by CT in this population. Adverse events were rare (< 1.5%) among patients < 50 years old with flank pain when CT was not required according to the clinical assessment of the EP.

### **Methods**

- The authors conducted a prospective observational study at two community EDs.
- They asked staff EPs to complete a data sheet on patients ages 18 to 50 years with a first episode of flank pain, recording 1) if the flank pain was consistent with renal colic and 2) if the EP felt abdominal CT was indicated.
- Adverse outcomes (defined a priori as urgent surgical procedures, disability, or death) were assessed by research assistants at 4 weeks using telephone follow-up and a hospital records search.

### **Results**

- They enrolled 389 patients; 353 completed follow-up (91%).
- The average age was 38.8 years, and 72.0% were male.
- Of 212 patients identified in the “CT not indicated” group, 2 had another diagnosis identified (unruptured diverticulitis and a ruptured ovarian cyst), but none had adverse outcomes (95% CI 0–1.4).

Read more: <http://www.mdlinx.com/pain-management/news-article.cfm/4603629/cone-beam-computed-tomography#ixzz2SGIXlwPK>

## **Fear of movement and avoidance behaviour toward physical activity in chronic-fatigue syndrome and fibromyalgia: state of the art and implications for clinical practice**

Clinical Rheumatology, 05/03/2013 Review Article Clinical Article

Nijs J et al.

Severe exacerbation of symptoms following physical activity is characteristic for chronic-fatigue syndrome (CFS) and fibromyalgia (FM). These exacerbations make it understandable for people with CFS and FM to develop fear of performing body movement or physical activity and consequently avoidance behaviour toward physical activity. Individually tailored cognitive behavioural therapy plus exercise training, depending on the patient's classification as avoiding or persisting, appears to be the most promising strategy for treating fear of movement and avoidance behaviour toward physical activity in patients with CFS and FM.

- The aims of this article were to review what measures are available for measuring fear of movement and avoidance behaviour, the prevalence fear of movement and avoidance behaviour toward physical activity and the therapeutic options with fear of movement and avoidance behaviour toward physical activity in patients with CFS and FM.
- The review revealed that fear of movement and avoidance behaviour toward physical activity is highly prevalent in both the CFS and FM population, and it is related to various clinical characteristics of CFS and FM, including symptom severity and self-reported quality of life and disability.
- It appears to be crucial for treatment (success) to identify CFS and FM patients displaying fear of movement and avoidance behaviour toward physical activity.

Read more: <http://www.mdlinx.com/rheumatology/news-article.cfm/4604759/chronic-fatigue-syndrome-chronic-pain-fear#ixzz2SGmIrGWR>

## Chronic pain/Anxiety

### **Association between anxiety, health-related quality of life and functional impairment in primary care patients with chronic pain**

General Hospital Psychiatry 05/03/2013 Review Article

Kroenke K et al.

Abstract

Objective

Anxiety and chronic pain are prevalent and frequently co-occur. Our purpose was to examine the association between anxiety, health-related quality of life (HRQL) and functional impairment in primary care patients with chronic musculoskeletal pain.

Methods

Data were drawn from baseline interviews of the 250 primary care patients enrolled in the Stepped Care to Optimize Pain care Effectiveness trial. Validated measures were used to determine the proportion of patients screening positive for five common anxiety disorders: generalized anxiety, panic, social anxiety, posttraumatic stress and obsessive-compulsive disorder. Bivariate analyses examined associations between the type and number of anxiety disorders for which patients screened positive and representative pain, psychological and other HRQL outcomes. Multivariable models controlling for major depression and other covariates examined the association between the number of screen-positive anxiety conditions and functional impairment in psychological [SF-12 mental component summary (MCS) score], pain [Brief Pain Inventory (BPI) interference score] and work (disability days) domains.

Results

One hundred fourteen (45%) patients screened positive for at least one anxiety disorder and, compared to the 136 screen-negative patients, had significantly worse scores across multiple pain, psychological and other HRQL domains. Substantial impairment was seen for each of the five screen-positive anxiety conditions and progressively worsened as the number of conditions increased from one ( $n=54$ ) to two ( $n=26$ ) to  $\geq 3$  ( $n=34$ ). The number of screen-positive anxiety conditions was strongly associated ( $P<.0001$ ) with worse BPI interference and MCS scores and more disability days in models adjusting for age, sex and medical comorbidity. After further adjusting for major depression, associations were attenuated but remained significant for BPI interference ( $P<.0001$ ) and MCS ( $P=.018$ ) and marginally significant for disability days ( $P=.062$ ).

Conclusion

Nearly half of primary care patients with chronic pain screen positive for one or more anxiety disorders, which in turn are adversely associated with impairment across multiple domains of HRQL. Detecting and treating anxiety may be an important component of pain management.

## Chronic LBP/Impact

### "Lives on Hold: A Qualitative Synthesis Exploring the Experience of Chronic Low-back Pain."

Surgical 'Never-Events' Are Shockingly Common; and More Wayne J. Guglielmo, MA –

MEDSCAPE Surgeons Make Big Mistakes Nearly 80 Times a Week As every doctor knows, "never-events" are the kind of medical mistakes that should simply not occur. Despite this, and despite hospital and physician risk-management efforts to prevent them, such events occur more often than people believe, according to a recent study by patient safety researchers at Johns Hopkins University School of Medicine in Baltimore, Maryland.[1] The full study appears in the April issue of the journal *Surgery*. The study estimated that "a surgeon in the United States leaves a foreign object such as a sponge or towel inside a patient's body after an operation 39 times a week, performs the wrong procedure on a patient 20 times a week, and operates on the wrong body site 20 times a week." To identify malpractice judgments and out-of-court settlements, researchers used data from the National Practitioner Data Bank, a federal repository of medical malpractice claims. On the basis of such data, the researchers estimate that 4044 never-events occur in the United States each year. Surgeons between the ages of 40 and 49 years were responsible for more than one third of the events, whereas surgeons older than 60 years were responsible for 14.4%. Approximately 6 in 10 of the surgeons involved in a never-event were named in more than 1 separate malpractice report, and more than 1 in 10 were involved in at least 1 separate surgical never-event. Medical centres have put safeguards in place to prevent such mistakes. Among other things, they have instituted mandatory "time-outs" in the operating room, during which the team is supposed to match the surgical plans with the patient on the table; they have required that surgical sites be designated with indelible ink; and they have insisted that surgical team members count such items as sponges and towels before and after surgery.

But critics think more needs to be done, including public reporting of never-events. Such reporting would not only help consumers make informed choices; it would "put hospitals under the gun to make things safer," says Marty Makary, an associate professor of surgery at Johns Hopkins and one of the study's authors.

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## LBP/Twins study

### **Nature or nurture in low back pain? Results of a systematic review of studies based on twin samples.** Eur J Pain 2013 Jan 20.

Twin studies are becoming popular to investigate risk factors for low back pain (LBP) because they consider the genetic factor and allow for more precise estimates of risks. We aimed to identify and summarize the results of studies based on twin samples investigating risk factors for LBP. The MEDLINE, CINAHL, LILACS, Web of Science and EMBASE databases were searched. Prospective and cross-sectional observational studies of LBP involving twins were included. The exposure factors could be genetics (heritability) or environmental such as smoking, alcohol consumption, body mass index and medical history. Pooling was attempted using an inverse variance weighting and fixed effects model. Twenty-seven studies were included. Estimates of heritability effects ranged from 21% to 67%.

- The genetic component was higher for more chronic and disabling LBP than acute and less disabling LBP.
- Smoking was significantly associated with LBP with a longitudinal and a cross-sectional study also identifying a dose-response relationship in people with chronic LBP.
- Obesity was associated with LBP with a cross-sectional study identifying a dose-response relationship.
- No association between alcohol consumption and LBP was identified.
- Co-morbidities such as asthma, diabetes and osteoarthritis were associated with

The contribution of genetics to LBP appears to be dependent on the severity of the condition. Twin studies could be better used to explore possible causation paths between lifestyle factors, co-morbidities and LBP.

### **How Far Into A Degenerated Disc Can Nerves And Blood Vessels Penetrate?**

Bone Joint J 2013 Vol. 95-B No. Supp 17 16

Discogenic pain is associated with ingrowth of blood vessels and nerves, but uncertainty over the extent of ingrowth is hindering development of appropriate treatments. We hypothesise that adult human annulus fibrosus is such a dense cross-linked tissue that ingrowth via the annulus is confined to a) peripheral regions, and b) fissures extending into the annulus. Methods Disc tissue was examined from 61 patients (aged 37–75 yrs) undergoing surgery for disc herniation, degeneration or scoliosis. 5 µm sections were stained with H&E to identify structures and tissue types. 30 µm frozen sections were examined using confocal microscopy, following immunostaining for CD31 (an endothelial cell marker), PGP 9.5 and Substance P (general and nociceptive nerve markers, respectively). Fluorescent tags were attached to the antibodies. „Volocity“ software was used to calculate numbers and total cross-sectional area of labelled structures, and to measure their distance from the nearest free surface (disc periphery, or annulus fissure).

Results Maximum penetration of blood vessels and nerves from the peripheral annulus was 4,800 µm and 2,200 µm respectively. Maximum distance of nerves and vessels from the nearest free surface was 236 µm and 888 µm. Substance P (but not PGP 9.5) was colocalised with blood vessels, and both number and area of Substance P-stained structures were inversely correlated with grade of disc degeneration.

Interpretation Thick sections and fluorescent markers can show reliably where labelled structures are not present.

**Results** therefore support our hypothesis: deep penetration of nerves into the human annulus occurs only if fissures are present.

## Phantom Limb Pain/diabetic/amputation

### **Phantom limb pain after amputation in diabetic patients does not differ from that after amputation in nondiabetic patients**

PAIN; 154 (5); Pages 729-732, May 2013

There is a commonly held belief that diabetic amputees experience less phantom limb pain than nondiabetic amputees because of the effects of diabetic peripheral neuropathy; however, evidence to verify this claim is scarce. In this study, a customised postal questionnaire was used to examine the effects of diabetes on the prevalence, characteristics, and intensity of phantom limb pain (PLP) and phantom sensations (PS) in a representative group of lower-limb amputees.

Participants were divided into those who had self-reported diabetes (DM group) and those who did not (ND group). Participants with diabetes were further divided into those with long-duration diabetes (>10 years) and those with short-duration diabetes. Two hundred questionnaires were sent, from which 102 responses were received. The overall prevalence of PLP was 85.6% and there was no significant difference between the DM group (82.0%) and the ND group (89.4%) ( $P = 0.391$ ). There was also no difference in the prevalence of PS: DM group (66.0%), ND group (70.2%) ( $P = 0.665$ ). The characteristics of the pain were very similar in both groups, with sharp/stabbing pain being most common. Using a 0–10 visual analogue scale, the average intensity of PLP was 3.89 ( $\pm 0.40$ ) for the DM group and 4.38 ( $\pm 0.41$ ) for the ND group, which was not a statistically significant difference ( $P = 0.402$ ). Length of time since diagnosis of diabetes showed no correlation with average PLP intensity. Our findings suggest that there is no large difference in the prevalence, characteristics, or intensity of PLP when comparing diabetic and nondiabetic amputees, though a larger adjusted comparison would be valuable.

## Opioid use

### **Medical use, medical misuse, and nonmedical use of prescription opioids: Results from a longitudinal study**

PAIN; 154 (5); Pages 708-713, May 2013

The objective of this study was to examine the prevalence and patterns associated with past-year medical use, medical misuse, and nonmedical use of prescription opioids (NMUPO) among adolescents over a 2-year time period and to examine substance abuse, sleeping problems, and physical pain symptoms associated with these patterns of medical use, medical misuse, and NMUPO. A Web-based survey was self-administered by a longitudinal sample of 2050 middle and high school students in 2009–2010 (Year 1) and again in 2010–2011 (Year 2). The study was set in 2 southeastern Michigan school districts. The longitudinal sample consisted of 50% females, 67% Whites, 28% African-Americans, and 5% from other racial/ethnic categories. Main outcome measures were past-year medical use, medical misuse, and NMUPO. Of those reporting appropriate medical use of prescription opioids in Year 1, approximately 34% continued medical use in Year 2. Of those reporting past-year NMUPO in Year 1, approximately 25% continued NMUPO in Year 2. Appropriate medical use and NMUPO for pain relief was more prevalent among girls than boys. Multiple logistic regression analyses indicated that the odds of a positive screen for substance abuse in Year 2 were greater for adolescents who reported medical misuse or NMUPO for non-pain-relief motives in Year 1 compared with those who did not use prescription opioids. The findings indicate an increased risk for substance abuse among adolescents who report medical misuse or NMUPO for non-pain-relief motives over time. The findings have important clinical implications for interventions to reduce medical misuse and NMUPO among adolescents.

**Five-factor personality traits and pain sensitivity: A twin study**

PAIN 154 (5); Pages 722-728, May 2013

Factors underlying individual differences in pain responding are incompletely understood, but are likely to include genetic influences on basal pain sensitivity in addition to demographic characteristics such as age, sex, and ethnicity, and psychological factors including personality. This study sought to explore the relationship between personality traits and experimental pain sensitivity, and to determine to what extent the covariances between these phenotypes are mediated by common genetic and environmental factors. A sample composed of 188 twins, aged 23 to 35 years, was included in the study. Heat pain intensity (HPI) and cold-pressor pain intensity (CPI) ratings were obtained using standardized pain testing procedures, and personality traits were assessed with the NEO Personality Inventory, Revised.

Associations between personality and the pain sensitivity indices were examined using zero-order correlations and generalized estimating equations. Bivariate Cholesky models were used in the biometric analyses. The most robust finding was a significant phenotypic association between CPI and the personality facets Impulsiveness (a facet of Neuroticism) and Excitement-Seeking (a facet of Extraversion), and estimates of the genetic correlation were .37 ( $P < .05$ ) and .43 ( $P < .05$ ), respectively. In contrast, associations between HPI and personality seemed weak and unstable, but a significant effect of Angry Hostility (a facet of Neuroticism) emerged in generalized estimating equations analysis. Although the genetic correlation between these phenotypes was essentially zero, a weak but significant individual-specific environmental correlation emerged ( $r_e = .21$ ,  $P < .05$ ). Taken together, these findings suggest that CPI is more consistently related to personality dispositions than HPI, both phenotypically and genetically.

Upper c spine/Pre-manipulative hold

**Diagnostic accuracy of premanipulative vertebrobasilar insufficiency tests: A systematic review**

June 2013 Manual Therapy

Nathan Hutting | Arianne P. Verhagen | Veerle Vijverman | Martin D.M. Keesenberg | Gillian Dixon | Gwendolijne G.M. Scholten-Peeters

Abstract:

Study design A systematic review of diagnostic accuracy studies.

Objective To evaluate the diagnostic accuracy of the premanipulative vertebrobasilar insufficiency (VBI) tests.

Summary of background data The aim of premanipulative vertebrobasilar testing is to evaluate the adequacy of blood supply to the brain, by compressing the vertebral artery and examining for the onset of signs and symptoms of cerebrovascular ischemia. Although clinicians consider pre-manipulative testing important before applying spinal manipulations, the diagnostic accuracy has not been systematically reviewed.

Methods A search was made in PUBMED, CINAHL and EMBASE databases from their date of inception until 2nd May 2012. Studies were included if they compared a VBI test with a reference test, and sensitivity and specificity were reported or could be calculated. The methodological quality of the studies was evaluated using QUADAS. Agreement between reviewers was calculated and expressed as a percentage and quantified by kappa statistics.

Results Of the 1677 potential citations only 4 studies were included, all of questionable quality. Sensitivity was low and ranged from 0 to 57%, specificity from 67 to 100%, positive predictive value from 0% to 100%, and negative predictive value from 26 to 96%. The positive likelihood ratio ranged from 0.22 to 83.25 and the negative likelihood ratio from 0.44 to 1.40.

Conclusion Based on this systematic review of only 4 studies it was not possible to draw firm conclusions about the diagnostic accuracy of premanipulative tests. However, data on diagnostic accuracy indicate that the premanipulative tests do not seem valid in the premanipulative screening procedure. A surplus value for premanipulative tests seems unlikely.

**Is alcohol intake associated with low back pain? A systematic review of observational studies**

June 2013

Paulo Henrique Ferreira | Marina Barros Pinheiro | Gustavo Carvalho Machado | Manuela Loureiro Ferreira

Abstract: Background Alcohol intake has been widely reported as a risk factor for low back pain (LBP), however, the literature is inconclusive about this association.

Objectives To determine, in a systematic review, the relationship between alcohol intake and LBP

Methods A search was conducted in CINAHL, LILACS, Medline, National Research Register and Web of Science to identify studies that investigated the association between alcohol intake and LBP. Quantitative results and its estimators were extracted. When possible, meta-analyses were performed using a random effects model.

Results Twenty-six studies were included in this review. Twenty-three studies were retrospective cohorts, two were case-controls, and one employed a longitudinal design. Pooled results from nine studies (two case-controls and seven retrospective cohorts) showed that alcohol consumption is slightly associated with LBP (OR: 1.3; 95% CI: 1.1–1.5). This association appears to be present in studies investigating alcohol as an abuse dependence substance in chronic LBP. Remaining individual studies tended to report no statistical significant association. No dose-response relationship was identified. Only one longitudinal study was identified and even though alcohol consumption was found to be negatively associated with a future episode of LBP (OR: 0.7; 95% CI: 0.5–0.9) this association lost significance for future incidence of LBP in people with no LBP at baseline.

Conclusions Alcohol consumption appears to be associated with complex and chronic LBP only and in people with alcohol consumption dependence. Clinicians in the musculoskeletal field could use this information to design educational strategies for this population.

## Thrust vs. non thrust/LBP

### **Early use of thrust manipulation versus non-thrust manipulation: A randomized clinical trial**

June 2013 Manual Therapy

Chad Cook | Kenneth Learman | Chris Showalter | Vincent Kabbaz | Bryan O'Halloran

Abstract:

The purpose of this study was to investigate the comparative effectiveness of early use of thrust (TM) and non-thrust manipulation (NTM) in sample of patients with mechanical low back pain (LBP).

The randomized controlled trial included patients with mechanically reproducible LBP,  $\geq$ age 18-years who were randomized into two treatment groups. The main outcome measures were the Oswestry Disability Index (ODI) and a Numeric Pain Rating Scale (NPRS), with secondary measures of Rate of Recovery, total visits and days in care, and the work subscale of the Fears Avoidance Beliefs Questionnaire work subscale (FABQ-w). A two-way mixed model MANCOVA was used to compare ODI and pain, at baseline, after visit 2, and at discharge and total visits, days in care, and rate of recovery (while controlling for patient expectations and clinical equipoise).

A total of 149 subjects completed the trial and received care over an average of 35 days. There were no significant differences between TM and NTM at the second visit follow-up or at discharge with any of the outcomes categories. Personal equipoise was significantly associated with ODI and pain.

The findings suggest that there is no difference between early use of TM or NTM, and secondarily, that personal equipoise affects study outcome. Within-groups changes were significant for both groups.

## C spine/motor control/fly test

### **Database of movement control in the cervical spine. Reference normal of 182 asymptomatic persons**

June 2013 Manual therapy

Gudny Lilja Oddsdottir | Eythor Kristjansson | Magnus Kjartan Gislason

**Abstract:** In this study, the first normative database of movement control in the cervical spine has been established. For this purpose the Fly Test was used, which is a reliable and valid clinical test capable of detecting deficient movement control of the cervical spine in patients with neck pain and its associated disorders. One hundred and eighty-two asymptomatic persons, eighty-three men and ninety-nine women, aged 16–74 years, divided into six age groups, were recruited.

The Fly Test, using a 3-space Fastrak device, recorded the accuracy of cervical spine movements when tracking three incrementally difficult movement patterns. Amplitude accuracy (AA), directional accuracy (DA), and jerk index (JI) were compared across patterns and age groups. A multivariate analysis of variance revealed a significant effect for age ( $p < 0.001$ ) but not gender ( $p > 0.05$ ). Lower accuracy for AA and DA in all three movement patterns was observed in the groups of subjects aged 55–64 and 65–74 years, and also for JI in the easy and medium patterns.

Knowledge of normative values for the Fly Test is important and useful in identifying impaired movement control and monitoring the effectiveness of treatment interventions in patients with neck pain of traumatic and non-traumatic origin.

C spine/exercise

**A randomised controlled trial comparing graded exercise treatment and usual physiotherapy for patients with non-specific neck pain (the GET UP neck pain trial)**

June 2013

Sionnadh M. McLean | Jennifer A. Klaber Moffett | Donald M. Sharp | Eric Gardiner

Abstract: Evidence supports exercise-based interventions for the management of neck pain, however there is little evidence of its superiority over usual physiotherapy. This study investigated the effectiveness of a group neck and upper limb exercise programme (GET) compared with usual physiotherapy (UP) for patients with non-specific neck pain. A total of 151 adult patients were randomised to either GET or UP. The primary measure was the Northwick Park Neck pain Questionnaire (NPQ) score at six weeks, six months and 12 months. Mixed modelling identified no difference in neck pain and function between patients receiving GET and those receiving UP at any follow-up time point. Both interventions resulted in modest significant and clinically important improvements on the NPQ score with a change score of around 9% between baseline and 12 months.

Both GET and UP are appropriate clinical interventions for patients with non-specific neck pain, however preferences for treatment and targeted strategies to address barriers to adherence may need to be considered in order to maximise the effectiveness of these approaches

## Stretching/gastroc tendon

### **Time course of changes in passive properties of the gastrocnemius muscle–tendon unit during 5 min of static stretching**

June 2013 Manual Therapy

Masatoshi Nakamura | Tome Ikezoe | Yohei Takeno | Noriaki Ichihashi

Abstract:

The minimum time required for Static stretching (SS) to change the passive properties of the muscle–tendon unit (MTU), as well as the association between these passive properties, remains unclear.

This study investigated the time course of changes in the passive properties of gastrocnemius MTU during 5 min of SS.

The subjects comprised 20 healthy males ( $22.0 \pm 1.8$  years). Passive torque as an index of MTU resistance and myotendinous junction (MTJ) displacement as an index of muscle extensibility were assessed using ultrasonography and dynamometer during 5 min of SS.

Significant differences before and every 1 min during SS were determined using Scheffé's post hoc test. Relationships between passive torque and MTJ displacement for each subject were determined using Pearson's product–moment correlation coefficient. Although gradual changes in both passive torque and MTJ displacement were demonstrated over every minute, these changes became statistically significant after 2, 3, 4, and 5 min of SS compared with the values before SS. In addition, passive torque after 5 min SS was significantly lower than that after 2 min SS. Similarly, MTJ displacement after 5 min SS was significantly higher than that after 2 min SS.

A strong correlation was observed between passive torque and MTJ displacement for each subject ( $r = -0.886$  to  $-0.991$ ). These results suggest that SS for more than 2 min effectively increases muscle extensibility, which in turn decreases MTU resistance.

## Neuro tension/median nerve/C spine

### Sonography assessment of the median nerve during cervical lateral glide and lateral flexion. Is there a difference in neurodynamics of asymptomatic people?

June 2013 Manual Therapy

Peter Brochwicz | Harry von Piekartz | Christoff Zalpour

Abstract: There is clinical evidence that cervical lateral glide (CLG) improves neurodynamics and alleviates pain in patients who suffer from neurogenic arm pain. Cervical lateral flexion (CLF) is also a treatment method and a means of testing neurodynamics. However, for both techniques nerve movement has not yet been investigated using ultrasound imaging (US).

The purpose of this study was to quantify median nerve movement in the arm during CLG and CLF. For this study 27 healthy participants were recruited. Longitudinal movement of the median nerve was measured using US during CLG and CLF with the shoulder in 30° abduction in the middle and distal forearm (Fad). Data could be obtained from 11 participants (6 women and 5 men, average age 25.6 years,  $\pm 2.25$ ) at the middle forearm (Fam) and from 9 participants (5 women and 4 men, average age 27.2 years,  $\pm 2.75$ ) at the Fad. When applying CLF, the median nerve moved 2.3 mm (SEM  $\pm 0.1$  mm) at the Fam. At the same measuring point the median nerve moved 3.3 mm (SEM  $\pm 0.3$  mm,  $p = 0.005$ ) by applying CLG. At the Fad the difference between CLF and CLF amounted to 0.6 mm (CLF: 1.9 mm (SEM  $\pm 0.2$  mm, CLG: 2.5 mm (SEM  $\pm 0.2$  mm,  $p \leq 0.05$ ).

The movements during CLG are larger than during CLF. This difference is statistically significant. However, the statistical relevance cannot be extrapolated to a clinical relevance.

## Core muscle activation/SLR

### **Effects of the pelvic rotatory control method on abdominal muscle activity and the pelvic rotation during active straight leg raising**

June 2013 Manual Therapy

Kyung-hee Park | Sung-min Ha | Su-jung Kim | Kyue-nam Park | Oh-yun Kwon | Jea-seop Oh

**Abstract:** The aim of this study was to examine the effects of the pelvic rotatory control method on abdominal muscle activity and the amount of pelvic rotation while maintaining active straight leg raising (ASLR) at the level of the target bar.

In this study, 27 healthy female volunteers were instructed to perform ASLR, ASLR with a pelvic compression belt, and ASLR with the pelvic rotatory control method.

Surface electromyography (EMG) data were collected from the bilateral rectus abdominis (RA), external oblique abdominis (EO), and internal oblique abdominis (IO) muscles, and angles of pelvic rotation were measured using a 3-dimensional motion-analysis system. EMG activity of all abdominal muscles was greater and pelvic rotation was less in the pelvic rotatory control method compared with both the conventional ASLR method and the ASLR with pelvic compression belt method ( $p < 0.05$ ).

The findings suggest that ASLR with the pelvic rotatory control method is effective in activating the abdominal muscles and minimizing unwanted lumbopelvic rotation during ASLR exercise.

## C spine/rotation

### **Left/right neck rotation judgments are affected by age, gender, handedness and image rotation**

June 2013 Manual Therapy

Sarah B. Wallwork | David S. Butler | Ian Fulton | Halton Stewart | Igusti Darmawan | G. Lorimer Moseley

**Abstract:** Understanding motor imagery of the hands and feet has led to promising new treatments for neurological and chronic pain disorders. We aimed to extend this line of research to the neck with a view to developing the definitive platform study upon which clinical and experimental studies can be based.

In a cross-sectional experiment with a convenience sample, volunteers were shown 40 photographs of a model with their head turned to the left or right. Images were presented in random order and orientation. Participants judged the direction of neck rotation. They also completed a left/right hand judgment task. 1361 pain-free participants volunteered. Mean  $\pm$  standard deviation response time (RT) for making left/right judgments of neck rotation was  $1.621 \pm 0.501$  s. Median accuracy was 92.5%. RT was related to age, gender, and handedness ( $p < 0.001$ ).

That is, RT increased with age, was greater in females than in males and was greater in left-handers than in right-handers. Accuracy reduced with age ( $p < 0.001$ ), but was unaffected by gender or handedness. Judgments were more accurate when images showed a neck rotated to the right than when they showed a neck rotated to the left ( $p < 0.001$ ). The magnitude of image rotation affected both response time and accuracy ( $p < 0.001$ ). In general, the performance parameters established for left/right limb judgments also apply for left/right neck rotation judgments.

The current work establishes the definitive normative values against which clinical and experimental groups can be compared and reveals unpredicted effects of the direction neck rotation and the orientation of the image.

Trunk response/single leg stance/females

**Symmetry of trunk and femoro-pelvic movement responses to single leg loading tests in asymptomatic females**

June 2013 Manual Therapy

Stephen Edmondston | Yiru Leo | Barbara Trant | Randi Vatna | Michelle Kendell | Anne Smith

Abstract: Single leg loading tests are used clinically to examine balance and loading strategies in individuals with lower limb pain. Interpretation of these tests is through pain responses and comparisons with the asymptomatic leg.

The purpose of this study was to examine normal differences in trunk and pelvic movement between legs during the single leg stand, single leg squat, hip hitch and hip drop tests, and to compare observational and quantitative assessments of trunk movement during the single leg squat test.

Thirty-one asymptomatic females (age =  $21.7 \pm 3.1$  years) performed each test in a random sequence and quantitative analysis of coronal plane trunk lean (magnitude and direction), and femoro-pelvic angle was conducted using photographic image analysis. Within- and between-side minimal significant differences (MD) for femoro-pelvic angle were defined for each test. All tests had excellent within-side reliability (intra-class correlation coefficients (ICC) = 0.87–0.97, standard error of measurement (SEM) = 0.6–1.2°). The between-side MD for femoro-pelvic angle was 6.3, 6.5, 9.7, and 6.7° for the single leg stand, single leg squat, hip hitch and hip drop tests respectively. The magnitude of trunk lean was small, increased with test complexity and was not consistent in relation to the stance leg. Excellent agreement (87–93%) for the direction of trunk movement between observers, and between observational and quantitative analysis (80–96%) was established for the single leg squat test.

The patterns of trunk motion, and thresholds for significant difference in femoro-pelvic angle established in this study, will assist the interpretation of single leg loading tests in individuals with lower limb pain disorders.

## C spine postural assessment

### **Validity of surface markers placement on the cervical spine for craniocervical posture assessment**

June 2013 Manual Therapy  
I.C. Gadotti | D. Magee

Abstract:

The objective of this study was to evaluate the ability of a physical therapist to place surface markers on the skin over spinous process of C2, C4, C6, and C7 by evaluating the markers positioning using radiographs.

A total of 39 healthy female subjects participated. From 39 subjects, 22 had 2 radiographs taken and 17 had 1 radiograph taken. This study presents the results from the 22 subjects and from all 39 subjects together. The markers used were visible on the radiographs. The surface markers placement was tested by using percentage agreement. The criteria used were based on the direction of palpation. Only the markers placed that presented the center of the markers tip aligned to the tip of the spinous process was considered an acceptable placement. Only one level of agreement was considered. A misplaced marker was measured by its relation with the vertebra above or below. From the 22 subjects, the total percentage of agreement was 87.5%. Of the 12.5% error, 1.7% (3) occurred attempting to find C2; 4.5% (8) for C4; 3.4% (6) for C6; and 2.8% (5) for C7. From the total of 39 subjects, the total percentage of agreement was 87.8%. Of the 12.2% error 1.3% (2) occurred attempting to find C2; 2.6% (4) for C4; 3.2% (5) for C6; and 5.2% (8) for C7.

Based on the results from this study, clinicians and researchers should take into account possible errors on surface markers placement on the cervical spine when measuring craniocervical posture using photographs.

## C spine/respiratory weakness

### **Respiratory weakness in patients with chronic neck pain**

June 2013 Manual Therapy

Zacharias Dimitriadis | Eleni Kapreli | Nikolaos Strimpakos | Jacqueline Oldham

Abstract: Respiratory muscle strength is one parameter that is currently proposed to be affected in patients with chronic neck pain.

This study was aimed at examining whether patients with chronic neck pain have reduced respiratory strength and with which neck pain problems their respiratory strength is associated.

In this controlled cross-sectional study, 45 patients with chronic neck pain and 45 healthy well-matched controls were recruited. Respiratory muscle strength was assessed through maximal mouth pressures. The subjects were additionally assessed for their pain intensity and disability, neck muscle strength, endurance of deep neck flexors, neck range of movement, forward head posture and psychological states. Paired t-tests showed that patients with chronic neck pain have reduced Maximal Inspiratory (MIP) ( $r = 0.35$ ) and Maximal Expiratory Pressures (MEP) ( $r = 0.39$ ) ( $P < 0.05$ ).

Neck muscle strength ( $r > 0.5$ ), kinesiophobia ( $r < -0.3$ ) and catastrophizing ( $r < -0.3$ ) were significantly associated with maximal mouth pressures ( $P < 0.05$ ), whereas MEP was additionally negatively correlated with neck pain and disability ( $r < -0.3$ ,  $P < 0.05$ ).

Neck muscle strength was the only predictor that remained as significant into the prediction models of MIP and MEP. It can be concluded that patients with chronic neck pain present weakness of their respiratory muscles. This weakness seems to be a result of the impaired global and local muscle system of neck pain patients, and psychological states also appear to have an additional contribution. Clinicians are advised to consider the respiratory system of patients with chronic neck pain during their usual assessment and appropriately address their treatment.

## C spine/characteristics of new episode

### **Characteristics of a new episode of neck pain**

June 2013 Manual Therapy

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Abstract:

We report on the demographic and clinical characteristics of patients seeking manual therapy care for a new episode of non-specific neck pain and report on characteristics associated with higher levels of pain and disability in these patients. Demographic and clinical data were collected from patients who enrolled in a clinical trial of manipulation for neck pain. A profile of these patients was formulated using descriptive statistics. Multivariate linear regression models were used to describe the relationship between patient characteristics and severity of pain and disability. Patients with a new episode of non-specific neck pain reported pain intensity of  $6.1 \pm 2.0$  (mean  $\pm$  SD) on a 0–10 numerical scale and disability scores of  $15.7 \pm 7.4$  (Neck Disability Index/50).

Sixty-three percent had a prior history of neck pain. Concomitant symptoms were highly prevalent including upper limb pain (80%), headache (65%), upper back pain (64%), lower back pain (39%), dizziness (31%) and nausea (23%). There was a strong association between pain intensity and disability ( $p < 0.01$ ). More severe pain was also associated with not having concomitant back pain ( $p = 0.01$ ). More severe disability was also associated with poor general health ( $p < 0.01$ ), nausea ( $p < 0.01$ ), smoking, ( $p = 0.02$ ) low SF-12 mental health score ( $p = 0.02$ ), and shorter duration of symptoms ( $p = 0.03$ ). Patients with a new episode of neck pain, and deemed suitable for treatment with neck manipulation reported moderately high intensity pain and disability with widespread and frequent concomitant symptoms.

## Complex knees/patella

### **Management of a difficult knee problem**

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Jenny McConnell

Abstract:

Chronic disabling patellofemoral (PF) pain and instability can have significant effects on patient function and lifestyle. Although the management of PF pain has improved greatly, there is still a category of patient who tends to have recalcitrant symptoms, which are difficult to manage. The patient often bounces from practitioner to practitioner, physiotherapist as well as surgeon, for some relief of symptoms. However, often the underlying source of the pain is not well understood, so treatment can aggravate the symptoms.

The following case report demonstrates the effectiveness of physiotherapy in managing a complex clinical case of a 40 year old patient with bilateral PF symptoms of severe right knee pain and a subluxing left patella, as well as left hip pain. Some background is given as to the source of the right knee pain with magnetic resonance imaging (MRI) supporting the diagnosis and treatment progression.

The initial MRI demonstrated marked redundancy of the patellar tendon, resulting in patella baja (infera). Two years and ten treatments later, the patient, who originally could barely walk, was playing tennis for the first time in 25 years. Her MRI showed a complete resolution of the patella baja (infera), indirectly implying an improvement in quadriceps tone, as well as, resolution of the subchondral bone marrow oedema at the lateral patellar facet. Physiotherapists should not give up on patients with chronic musculoskeletal conditions as much can be done for them. These patients need clinicians to persevere, because certainly, for both patient and therapist, the rewards are great.

## Ankle dorsi flexion measurement

### **The intra and inter-rater reliability of a modified weight-bearing lunge measure of ankle dorsiflexion**

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Simon O'Shea | Kate Grafton

Abstract:

This study assessed the intra and inter-rater reliability of a modified weight-bearing lunge measure of ankle dorsiflexion range of movement. Thirteen healthy subjects were recruited. Each subject performed 3 repetitions of the lunging method with one rater and 3 more repetitions with a second rater within 30 min. The process was repeated within 3 h. Intra-rater reliability results indicated excellent correlation of measurements (intraclass correlation coefficients (ICCs) of 0.98–0.99). Standard error of measurement (SEM), 95% limits of agreement (LOA) and coefficient of repeatability (CR) calculations indicated suitably low ranges of measurement variance (SEM = 0.4 cm, LOA =  $\pm 1.28$  to  $\pm 1.47$  cm and CR = 1.21–1.35 cm). Inter-rater reliability was also deemed excellent (ICC = 0.99, SEM = 0.3 cm, LOA =  $\pm 0.83$  to  $\pm 1.47$  cm, CR = 1.44 cm).

The modified lunge technique therefore demonstrates excellent intra and inter-rater reliability.

## C spine/T spine

### **Normal kinematics of the neck: The interplay between the cervical and thoracic spines**

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Sharon M.H. Tsang | Grace P.Y. Szeto | Raymond Y.W. Lee

**Abstract:** The movement coordination between the cervical and thoracic spine was examined in 34 asymptomatic participants (24 female and 10 male). Three-dimensional electromagnetic motion sensors were attached to the skin overlying the head, T1, T6, and T12 spinous processes to measure the angular displacement of the cervical, upper thoracic, and lower thoracic spine during active neck movements. These displacement measurements were found to have excellent reliability, with intraclass correlation coefficient ranging from 0.899 to 0.993. The angular displacement–time curves of the cervical and upper thoracic spine were also highly repeatable, with coefficient of multiple determinations ranging from 0.900 to 0.967. Both the cervical and thoracic spines were found to contribute to active neck motion, the greatest contribution being from the cervical region in all movement directions. The inter-regional movement coordination between the cervical spine and upper thoracic spine in all three planes of movement was found to be high, as determined by cross-correlation analysis of the movements of the regions.

The current results suggest that the motion of the thoracic spine, in particular the upper thoracic spine, contributes to neck mobility, and that the upper thoracic spine should be included during clinical examination of neck dysfunction.

## High heel shoes/impact on lumbar spine and hip

### **The influence of high and low heeled shoes on EMG timing characteristics of the lumbar and hip extensor complex during trunk forward flexion and return task**

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Anna Mika | Brian C. Clark | Łukasz Oleksy

#### Abstract:

**Background** Recent studies suggest that wearing high-heel shoes increases the risk of developing certain musculoskeletal pain conditions. In this study we sought to examine whether heel height alters lumbar and hip extensor muscle timing characteristics during a standardized trunk flexion task.

**Methods** Thirty-one young, healthy women (22–27 years;  $168.6 \pm 5.1$  cm;  $57.1 \pm 11.8$  kg) participated in this study. Lumbar erector spinae (ES), gluteus Maximus (GM), and biceps femoris (BF) electromyographic (EMG) signals were recorded during a trunk flexion task where subjects were instructed to flex their trunk in the sagittal plane and then return to a neutral posture. The task was repeated under three footwear conditions: while wearing no footwear, while wearing shoes with 4-cm heels, and while wearing shoes with 10-cm heels. EMG onset and offset times, as well as EMG duration, were calculated for each muscle and compared across conditions.

**Results** We observed a significantly earlier onset of the ES EMG activity ( $1.36 \pm 0.61$  vs.  $1.56 \pm 0.67$  s), and significantly delayed onset of the GM EMG activity ( $1.72 \pm 0.66$  vs.  $1.28 \pm 0.58$  s) during the flexion phase of movement in the 10-cm heeled compared to the no footwear condition. The GM muscle also exhibited an earlier offset time in the 10-cm heel condition compared to the no footwear condition during the flexion movement ( $2.57 \pm 0.67$  vs.  $3.30 \pm 0.61$  s) as well as during the return from flexion movement phase ( $10.87 \pm 0.58$  vs.  $11.69 \pm 0.65$  s). These alterations in timing characteristic resulted in an overall decrease in the EMG duration for the GM muscle during the flexion movement.

**Conclusion** The results of this study suggest that high-heels alter trunk and hip extensor muscle coordination patterns. These findings, when considered in combination with other recent findings on the biomechanical effects of wearing high-heels, raise concern about whether wearing high heels results in abnormal spine loading patterns and increases the risk for developing musculoskeletal injuries.

## Sitting/Slump

### **What is slumped sitting? A kinematic and electromyographical evaluation**

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Brian C. Nairn | Stewart R. Chisholm | Janessa D.M. Drake

#### Abstract:

Slumped sitting is a commonly used reference posture when comparing effects of upright sitting in both clinical and non-clinical populations alike. The exact nature of slumped sitting has not been clearly defined, including regional differences within the posture, and how the passive nature of slumped sitting compares to an active-flexion posture.

Kinematic and electromyographical (EMG) data were collected from 12 males during three repeats of slumped sitting and seated maximum forward flexion. Spine angles were defined in four regions (three thoracic and lumbar) as well as for the pelvis, and EMG was collected from eight muscles bilaterally. Kinematic data were expressed as a range of motion (in degrees), and as a percent of full forward flexion while seated (%SIT-FF) and standing (%STAND-FF). EMG data were normalized to a percent maximum contraction (%MVC).

Results showed that slumped sitting is characterized by 10° posterior pelvis rotation, near end-range flexion of the mid- (90%SIT-FF) and lower- (81%SIT-FF) thoracic regions, and mid-range flexion of the upper-thoracic (51%SIT-FF) and lumbar (43%SIT-FF) regions. Comparison of slumped by %STAND-FF showed the upper- and mid-thoracic regions to have high variability and large values (over 100%STAND-FF). Muscle activation showed a significant 3%MVC reduction in the lower-thoracic erector spinae muscle when moving from upright to slumped sitting.

These data highlight the postural differences occurring within different spine regions, and interpretations that could be drawn, depending on which normalization (sit or stand) method is used.

## Foot/intrinsic training

### **Effect of plantar intrinsic muscle training on medial longitudinal arch morphology and dynamic function**

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Edward P. Mulligan | Patrick G. Cook

#### Abstract:

A specific training program emphasizing the neuromuscular recruitment of the plantar intrinsic foot muscles, colloquially referred to as “short foot” exercise (SFE) training, has been suggested as a means to dynamically support the medial longitudinal arch (MLA) during functional tasks.

A single-group repeated measures pre- and post-intervention study design was utilized to determine if a 4-week intrinsic foot muscle training program would impact the amount of navicular drop (ND), increase the arch height index (AHI), improve performance during a unilateral functional reaching maneuver, or the qualitative assessment of the ability to hold the arch position in single limb stance position in an asymptomatic cohort. 21 asymptomatic subjects (42 feet) completed the 4-week SFE training program.

Subject ND decreased by a mean of 1.8 mm at 4 weeks and 2.2 mm at 8 weeks ( $p < 0.05$ ). AHI increased from 28 to 29% ( $p < 0.05$ ). Intrinsic foot muscle performance during a static unilateral balancing activity improved from a grade of fair to good ( $p < 0.001$ ) and subjects experienced a significant improvement during a functional balance and reach task in all directions with the exception of an anterior reach ( $p < 0.05$ ).

This study offers preliminary evidence to suggest that SFE training may have value in statically and dynamically supporting the MLA. Further research regarding the value of this exercise intervention in foot posture type or pathology specific patient populations is warranted.

## **Manual therapy/Hip**

### **Immediate effects of hip mobilization on pain and baropodometric variables – A case report**

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Giovanni Esteves Ferreira | Carolina Cabral de Mello Viero | Matheus Noronha Silveira | Caroline Cabral Robinson | Marcelo Faria Silva

Abstract:

Manual therapy is an important tool for the treatment of musculoskeletal disorders of mechanical origin.

Since the hip is an important structure for weight bearing as well as static and dynamic balance, it is suggested that hip impairments may affect weight distribution. Both static and dynamic balance are dependent on adequate joint mobility which in the presence of any kind of alteration can lead to modifications of plantar pressure distribution patterns which, in turn, can be detected by computerized baropodometry. The aim of this study was to verify clinical and baropodometric immediate effects of a single session of hip mobilization in a patient with chronic anterior hip pain. A physically active 21-year old patient underwent a pre-intervention assessment which included pain rating, active and passive range of movement, passive accessory movement as well as static and dynamic barodometry. The intervention consisted of an anteroposterior grade III + mobilization of the right hip, which was conducted with patient in left side-lying with the right hip flexed at approximately 45°. After the intervention, the patient's pain was reduced and there was an improvement in the active movement related to the pain generation.

Baropodometric assessment showed plantar peak pressures shift on both feet, from forefoot to rear foot, and there was also reduction in anteroposterior center of pressure displacement on static recording.

Chronic nonspecific low-back pain (CLBP) is a prevalent, costly condition that is remarkably resistant to intervention. Substantial evidence suggests that a mismatch exists between the biomedical beliefs held by clinicians and patients and the biopsychosocial nature of CLBP experience. The aim of this metasynthesis of qualitative studies was to provide clinicians with a richer understanding of their patients' CLBP experience to highlight the importance of moving away from biomedical paradigms in the clinical management of CLBP. Methods: Qualitative studies exploring the CLBP experience from the perspective of the individual were included. Twenty-five articles representing 18 studies involving 713 participants were subjected to the 3-stage analytic process of extraction/coding, grouping, and abstraction. Results: Three main themes emerged: the social construction of CLBP; the psychosocial impact of the nature of CLBP; and coping with CLBP. Discussion: The authors conceptualize the experience of CLBP as biographical suspension in which 3 aspects of suspension are described: suspended "wellness," sense and directions for future research are discussed.