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## 2. LBP

### Educational level and LBP

#### **Does educational attainment increase the risk of low back pain when genetics is considered? A population-based study of Spanish twins**

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**Background Context** There is limited research investigating educational attainment as a risk factor for low back pain (LBP), with the influence of gender commonly being neglected. Furthermore, genetics and early shared environment explain a substantial proportion of LBP cases and need to be controlled for when investigating risk factors for LBP.

**Purpose** To investigate whether educational attainment affects the prevalence and risk of LBP differently in men and women while controlling for the influence of genetics and early shared environment.

**Study Design** This is a cross-sectional and prospective twin case-control study.

**Patient Sample** Adult monozygotic (MZ) and dizygotic (DZ) twins from the Murcia Twin Registry, with available data on educational attainment, formed the base sample for this study. The prevalence analysis considered twins with available data on LBP in 2013 (n=1,580). The longitudinal analysis considered twins free of LBP at baseline (2009–2011), with available data on LBP at follow-up (2013) (n=1,077).

**Outcome Measures** Data on the lifetime prevalence of activity limiting LBP (outcome) and educational attainment (risk factor) were self-reported.

**Methods** The prevalence analysis investigated the cross-sectional association between educational attainment and LBP, whereas the longitudinal analysis investigated whether educational attainment increased the risk of developing LBP. Both analyses were performed in the following sequence. First, a total sample analysis was performed on all twins (considering them as individuals), adjusting for confounding variables selected by the data. Second, to control for the influence of genetics and early shared environment, a within-pair case-control analysis (stratified by zygosity) was performed on complete twin pairs discordant for LBP (ie, one twin had LBP, whereas the co-twin did not). All analyses were stratified for gender where possible, with an interaction term determining whether gender was a significant moderator of the association between educational attainment and LBP.

**Results** Women with either general secondary or university education were less likely to experience (prevalence analysis) or to develop LBP (longitudinal analysis). Educational attainment did not affect the risk of LBP in men. When controlling for the effects of genetics and early shared environment, the relationship between educational status and LBP in women was no longer statistically significant.

**Conclusions** Educational attainment affects LBP differently in men and women, with higher levels of education only decreasing the risk of developing LBP in women. After adjusting for genetics and early shared environment, the relationship between educational attainment and LBP in women disappears. This suggests that genetics and early shared environment are confounding the relationship between educational attainment and LBP in women.

## 5. SURGERY

### PT helps

Eur Spine J. 2016 Nov;25(11):3550-3559. Epub 2016 Feb 25.

#### **A descriptive study of the utilization of physical therapy for postoperative rehabilitation in patients undergoing surgery for lumbar radiculopathy.**

Louw A1,2, Puentedura EJ3,4, Diener I2.

#### **PURPOSE:**

To determine the referral patterns, utilization and indications for postoperative physical therapy (PT) for lumbar radiculopathy. At least 50 % of patients following lumbar surgery (LS) for radiculopathy are referred for PT to address postoperative pain and disability. Very little is known regarding factors following LS that predict referral to PT, patient perceptions, satisfaction of postoperative PT and predictors of success for PT following LS for radiculopathy.

#### **METHODS:**

Sixty-five patients who underwent LS for radiculopathy completed outcome measures on pain and disability prior to, and 1, 3, 6 and 12 months after LS. They also completed a questionnaire regarding postoperative PT at the 12-month follow-up.

#### **RESULTS:**

The majority of patients (59.32 %) attended PT after LS for an average of 14 visits and rated PT favorably. Forty-five percent of the patients who did not attend PT after LS were of the opinion that they would have benefitted from PT after LS, and 62.5 % of these patients reported the surgeon not discussing postoperative PT after LS. Patients with longer duration of symptoms prior to surgery, with greater leg pain scores 1 month after surgery, and who did not feel as well prepared for surgery at the 1 year follow-up were more likely to receive PT, but this did not result in significantly better outcomes on any measure at any follow-up period and did not predict attendance in PT after LS.

#### **CONCLUSION:**

There is a need to determine if a subgroup of patients following LS exists who will respond favorably to postoperative PT

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Obesity and obesity

#### **Children born by Cesarean section may have a greater risk of obesity**

American Heart Association News, 11/16/2016

Children delivered by Cesarean section may have an increased risk for obesity compared to children born vaginally, according to research presented at the American Heart Association's Scientific Sessions 2016.

Compared to vaginally-delivered children, Cesarean-delivered children had 40 percent greater odds of becoming overweight or obese in childhood. This association was even greater if their mother was overweight or obese, suggesting that among obese mothers vaginal delivery may help reduce the intergenerational association of obesity.

This finding held even after accounting for the mother's age at the time of delivery, race, education, pre-pregnancy body mass index, pregnancy weight gain, air pollution exposure, and the child's birth weight.

The researchers noted that having an overweight mother is often associated with overweight or obese children, regardless of how the child is born, but the effect was stronger among women who delivered via Cesarean section.

"We think that the reason for the difference may be due to the beneficial microbes found in the birth canal that newborns are exposed to during a vaginal birth," said lead study author Noel Mueller, PhD, MPH, an assistant professor of epidemiology at Johns Hopkins University. "We suspect that these microbes may benefit a child's health, including enhancing metabolism and training the immune system."

"We need more studies to determine whether exposing Cesarean-delivered newborns to vaginal microbes at birth can reduce their future risk of metabolic disorders such as obesity."

Researchers analyzed data on 1,441 full-term deliveries from the Boston Birth Cohort. Among the study group, 57 percent of the women who gave birth by Cesarean were obese, and 53 percent of those who delivered vaginally were obese. Children ranged from ages two to eight at the time of outcome measurement.

### Menopause and loss of sexual function

#### **New study pinpoints timing for decline in sexual function over the menopause transition**

The North American Menopause Society News, 11/16/2016

**S**WAN data shows that black women have a lower drop in sexual function, whereas the drop in Japanese women is twice that of white women.

Although most medical professionals (and their patients) agree that sexual function declines with age, there remains debate about the contribution of menopause to sexual activity and functioning. A new study using data from the Study of Women's Health (SWAN), however, provides a more detailed timetable of sexual decline over the menopause transition.

The study was published online in the journal *Menopause*.

Sexual function data was gathered from nearly 1,400 women who were in either the natural menopause or hysterectomy groups of the SWAN study. No decline in sexual function was documented until 20 months before the final menstrual period. From this time until one year after the final period, sexual function scores decreased by 0.35 annually and continued to decline more than one year afterward but at a slower rate. The decline was smaller in black women and larger in Japanese than in white women. Women who had a hysterectomy before the final menstrual period did not show a decline in sexual function before surgery but did experience a decline afterward. In total, sexual decline persisted for five years after the final menstrual cycle.

Although menopause is often accompanied by such related symptoms as vaginal dryness, depression, and anxiety, these factors did not explain the effect of menopause or surgery on sexual function. The problem of declining sexual function is a serious one, because more than 75% of the middle-aged women in the study reported that sex was moderately to extremely important.

“This study highlights the need for healthcare providers to have open conversations with their patients about their sexual issues, because there are many options for women to help maintain or improve their sexual lives as they transition to and beyond menopause,” says Dr. JoAnn Pinkerton, NAMS executive director. “Low-dose vaginal estrogen, for example, which has minimal risks for most women, is an effective and safe treatment for painful intercourse as is a non-estrogen therapy called ospemifene.”

**Chronic pelvic pain and musculoskeletal problems**

Manipulative Physiol Ther. 2016 Oct 21. pii: S0161-4754(16)30213-5. doi: 10.1016/j.jmpt.2016.09.003.

**Musculoskeletal Dysfunctions in Patients With Chronic Pelvic Pain: A Preliminary Descriptive Survey.**

Mieritz RM<sup>1</sup>, Thorhaug K<sup>2</sup>, Forman A<sup>3</sup>, Mieritz HB<sup>4</sup>, Hartvigsen J<sup>5</sup>, Christensen HW<sup>6</sup>.  
Author information

Abstract

**OBJECTIVE:**

The purpose of this study was to determine the prevalence of musculoskeletal dysfunctions based on a standardized clinical examination of patients with chronic pelvic pain (CPP) who were referred to a specialized tertiary care center for laparoscopic examination. In addition, we stratified levels of self-reported pelvic pain, self-rated health, education, and work status based on musculoskeletal dysfunction status.

**METHODS:**

This study used a cross-sectional design to determine the prevalence of musculoskeletal dysfunctions in women with CPP who were referred to a tertiary care center specializing in care of women with CPP. The women completed a questionnaire and underwent a blinded systematic objective clinical examination of the musculoskeletal system by a doctor of chiropractic who then categorized the patients as having or not having musculoskeletal dysfunction.

**RESULTS:**

Ninety-four patients returned the questionnaire, completed the clinical examination, and fulfilled the inclusion criteria. More than half of the referred patients with CPP (48 out of 94) had musculoskeletal dysfunctions in the lumbar/pelvic region. No statistically significant differences were found between the groups with respect to self-rated health, education, work status, and pain level. Pain location was significantly different after Bonferroni correction in 1 out of the 36 aspects.

**CONCLUSIONS:**

In this sample of CPP patients, 51% were categorized as having a musculoskeletal dysfunction. Overall, CPP patients were similar with respect to certain characteristics, such as age, body mass index, and pain level, regardless of their classification; however, patients with musculoskeletal dysfunction tended to report more pain in the front and back of the lower limbs.

**Menopause and pain**

J Pain. 2016 Nov 8. pii: S1526-5900(16)30282-6. doi: 10.1016/j.jpain.2016.10.012.

**Pain Severity in Relation to the Final Menstrual Period in a Prospective Multiethnic Observational Cohort: Results from the Study of Women's Health Across the Nation (SWAN).**

Lee YC<sup>1</sup>, Karlamangla AS<sup>2</sup>, Yu Z<sup>3</sup>, Liu CC<sup>3</sup>, Finkelstein JS<sup>4</sup>, Greendale GA<sup>2</sup>, Harlow SD<sup>5</sup>, Solomon DH<sup>3</sup>.

Author information

**Abstract**

The development of pain is common in midlife, resulting in increased healthcare utilization and costs. The aim of this study was to determine the longitudinal trajectory of overall bodily pain among women during the transition between the reproductive years and menopause. We conducted analyses on a community-based, longitudinal cohort of women enrolled in the Study of Women's Health Across the Nation. One thousand four hundred and ninety-five women met inclusion criteria, including: 1) defined date of the final menstrual period (FMP) and 2) complete data on SF-36 bodily pain. The primary exposure was time to/from FMP. The primary outcome was the rate of change in SF-36 bodily pain, measured on a scale of 0-100 with 100 being the most severe pain. We performed within-person trajectory analyses using piecewise regression following nonparametric modeling of functional forms. Mean bodily pain score at the time of the FMP was 29. Mean bodily pain increased at a rate of 0.26 per year during the transmenopause (the interval spanning 4.5 years prior to the FMP through 0.5 years after FMP), and decreased at a rate of 0.23 per year after that. Depression and sleep problems were associated with greater increases in pain during the late reproductive years, whereas abdominal cramps at baseline predicted greater decreases in pain during the late reproductive years.

***PERSPECTIVES:***

This article demonstrates that bodily pain increases during the transmenopause and then diminishes during postmenopause. These differences may reflect differences in underlying mechanisms of pain in the two periods. Although mean changes were small and unlikely to be clinically meaningful, the magnitude of change varied across subgroups of women.

## 8. VISCERA

### Chronic pain and heart disease

Clin J Pain. 2016 Dec;32(12):1062-1068.

#### **The Association Between Chronic Pain and Cardiac Disease: A Cross-sectional Population Study.**

Fayaz A<sup>1</sup>, Watt HC, Langford RM, Donaldson LJ.

Author information

Abstract

#### **OBJECTIVES:**

Chronic pain may increase the risk of cardiac disease, but the extent to which confounding variables account for this association has yet to be satisfactorily established. This study aims to examine the possibility of an independent association between these 2 variables.

#### **METHODS:**

We applied logistic regression analysis to data from 8596 adults surveyed in a population study of the health of the population of England. The association between cardiac disease (angina and/or myocardial infarction) and chronic pain (pain lasting >3 months) was explored, taking account of 10 potentially confounding variables including the regular use of nonsteroidal anti-inflammatory drugs.

#### **RESULTS:**

Participants reporting chronic pain (n=3023) were more likely to experience cardiac disease than those without pain: odds ratio (OR), 1.55; 95% confidence interval (CI), 1.15-2.07. Subsets of participants fulfilling various criteria for high-intensity chronic pain demonstrated stronger associations with cardiac disease suggesting a "dose-response" element to the relationship: chronic widespread pain (OR, 3.3; 95% CI, 1.42-7.68); higher-disability chronic pain (OR, 2.35; 95% CI, 1.71-3.23); and higher average chronic pain score (OR, 1.95; 95% CI, 1.40-2.71). Adjustment for regular prescription of nonsteroidal anti-inflammatory drugs did not reduce the association of chronic pain with cardiac disease.

#### **DISCUSSION:**

Patients reporting chronic pain, in particular those most severely affected, may be at significantly increased risk of cardiac disease. Future studies should focus on determining whether reducing the impact of chronic pain can improve cardiac health.

**Recurrent Laryngeal nerve**

Surg Endosc. 2016 Nov 8.

**Impact of routine recurrent laryngeal nerve monitoring in prone esophagectomy with mediastinal lymph node dissection.**

Hikage M<sup>1</sup>, Kamei T<sup>2</sup>, Nakano T<sup>2</sup>, Abe S<sup>2</sup>, Katsura K<sup>2</sup>, Taniyama Y<sup>2</sup>, Sakurai T<sup>2</sup>, Teshima J<sup>2</sup>, Ito S<sup>2</sup>, Niizuma N<sup>2</sup>, Okamoto H<sup>2</sup>, Fukutomi T<sup>2</sup>, Yamada M<sup>2</sup>, Maruyama S<sup>2</sup>, Ohuchi N<sup>3</sup>.

Author information

Abstract

**BACKGROUND:**

The problem of recurrent laryngeal nerve (RLN) paralysis (RLNP) after radical esophagectomy remains unresolved. Several studies have confirmed that intraoperative nerve monitoring (IONM) of the RLN during thyroid surgery substantially decreases the incidence of RLN damage. This study tried to determine the feasibility and effectiveness of IONM of the RLN during thoracoscopic esophagectomy in the prone position for esophageal cancer.

**METHODS:**

All 108 patients who underwent prone esophagectomy at Tohoku University Hospital between July 2012 and March 2015 were included in this study. We divided patients into two groups: a control group (No-Monitoring group, surgery without IONM; n = 54) and a study group (Monitoring group, surgery with IONM; n = 54). In Monitoring group, neural stimulation was performed for both RLNs before and after dissection in the thoracic procedure, then for RLNs and vagus nerves (VNs) in the cervical procedure. The feasibility of IONM in Monitoring group and early surgical outcomes were retrospectively compared with those in No-Monitoring group.

**RESULTS:**

IONM could be performed for 47 cases (87.0%) in Monitoring group. Reasons for discontinuation were use of muscle relaxants (3 patients), change in thoracotomy procedure (2 patients), past rib bone fracture (1 patient), and allergic shock by transfusion (1 patient). Right RLNPs were identified postoperatively in 4 patients, and left RLNPs in 23 patients. IONM sensitivities were 92.7 and 88.0% for the right and left VNs, respectively. Incidences of postoperative RLNP, aspiration, and primary pneumonia did not differ significantly between groups.

**CONCLUSIONS:**

This study confirmed the feasibility and safety of IONM of the RLN for thoracoscopic esophagectomy in the prone position. No significant differences in postoperative outcomes were seen between esophagectomy with and without IONM.

**KEYWORDS:**

Esophageal cancer; Intraoperative nerve stimulation; Mediastinal lymph node dissection; Postoperative complication; Recurrent laryngeal nerve palsy; Thoracoscopic esophagectomy in prone position

**Cerebellum and IBS**

Cerebellum. 2016 Oct 28.

**Altered Cerebellar Activity in Visceral Pain-Related Fear Conditioning in Irritable Bowel Syndrome.**

Claassen J<sup>1</sup>, Labrenz F<sup>2</sup>, Ernst TM<sup>1</sup>, Icenhour A<sup>2</sup>, Langhorst J<sup>3</sup>, Forsting M<sup>4</sup>, Timmann D<sup>1</sup>, Elsenbruch S<sup>5</sup>.  
Author information

**Abstract**

There is evidence to support a role of the cerebellum in emotional learning processes, which are demonstrably altered in patients with chronic pain. We tested if cerebellar activation is altered during visceral pain-related fear conditioning and extinction in irritable bowel syndrome (IBS). Cerebellar blood oxygenation level-dependent (BOLD) data from N = 17 IBS patients and N = 21 healthy controls, collected as part of a previous fMRI study, was reanalyzed utilizing an advanced normalizing method of the cerebellum. The differential fear conditioning paradigm consisted of acquisition, extinction, and reinstatement phases. During acquisition, two visual conditioned stimuli (CS) were presented either paired (CS+) or unpaired (CS-) with painful rectal distension as unconditioned stimulus (US). In the extinction phase, the CS+ and CS- were presented without US. For reinstatement, unpaired US presentations were followed by unpaired CS+ and CS- presentations. Group differences in cerebellar activation were analyzed for the contrasts CS+ > CS- and CS- > CS+. During acquisition, IBS patients revealed significantly enhanced cerebellar BOLD responses to pain-predictive (CS+) and safety (CS-) cues compared to controls ( $p < 0.05$ , family-wise error corrected). Increased activation was found in three main clusters, including the vermis (maximum in vermal lobule VI), intermediate cerebellum (maximum in lobule VIII), and the posterolateral cerebellar hemisphere (maximum in lobule VI). Areas overlapped for the contrasts CS+ > CS- and CS- > CS+. Group differences were most prominent in the contrast CS- > CS+. During extinction and reinstatement, no significant group differences were found. During visceral pain-related fear conditioning, IBS patients showed increased activations in circumscribed areas of the medial, intermediate, and lateral cerebellum. These areas are involved in autonomic, somatosensory, and cognitive functions and likely contribute to the different aspects of pain-related fear. The cerebellum contributes to altered pain-related fear learning in IBS.

**Physical activity and gastric CA**

Clin J Sport Med. 2016 Nov;26(6):445-464.

**Physical Activity and Gastric Cancer Risk: A Systematic Review and Meta-Analysis.**

Psaltopoulou T<sup>1</sup>, Ntanasis-Stathopoulos I, Tzanninis IG, Kantzanou M, Georgiadou D, Sergentanis TN.  
Author information

Abstract

**OBJECTIVE:**

Physical activity represents a well-established way to prolong the life span; yet, it remains an unfulfilled goal for a great part of the population. In parallel, the burden of gastric cancer is considerable throughout the globe. In that context, the present meta-analysis aims to shed light on the association between physical activity and gastric cancer risk.

**DATA SOURCES:**

Eligible observational studies were sought in PubMed up to June 01, 2015. In addition, a snowball procedure was conducted and contact with authors was implemented. Separate analyses were performed by type of physical activity (total; occupational; recreational), study design, published/provided data, anatomical site, and study location, along with stratification by gender.

**MAIN RESULTS:**

Ten cohort studies (7551 incident cases in a total cohort size of 1 541 208 subjects) and 12 case-control studies (5803 cases and 73 629 controls) were eligible. "Any" type of physical activity was associated with lower risk of gastric cancer [pooled relative risk (RR) = 0.81; 95% CI: 0.73 to 0.89], which was reproducible in men (pooled RR = 0.87; 95% CI: 0.77-0.99). The protective effect was significant in the subgroup analyses of published data, noncardia cancer (pooled RR = 0.62; 95% CI: 0.52-0.75), and studies stemming from Asia (pooled RR = 0.82; 95% CI: 0.74-0.90).

**CONCLUSIONS:**

This meta-analysis suggests a protective effect of physical activity regarding gastric cancer risk, especially in Asian populations.

## 10 A. CERVICAL SPINE

### Stress and neck pain

J Psychosom Res. 2016 Nov;90:70-81. doi: 10.1016/j.jpsychores.2016.09.006. Epub 2016 Sep 9.

#### **Is there a relationship between psychological stress or anxiety and chronic nonspecific neck-arm pain in adults? A systematic review and meta-analysis.**

Ortego G<sup>1</sup>, Villafañe JH<sup>2</sup>, Doménech-García V<sup>3</sup>, Berjano P<sup>2</sup>, Bertozzi L<sup>4</sup>, Herrero P<sup>3</sup>.

Author information

Abstract

#### **PURPOSE:**

To systematically review and analyze the research evidence linking stress or anxiety to chronic nonspecific neck-arm pain (NSNAP) in adults.

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

Data were obtained from Pubmed, Scopus, PsycInfo, Web of Science, Physiotherapy Evidence Database (PEDro) and The Cochrane library database from their inception to July 2015. Two authors independently conducted the searches, extracted data, and completed methodological quality assessments. The methodological quality of the cohort and case-control studies was evaluated using the Newcastle-Ottawa scale, whilst the quality of the Randomized Controlled Trial (RCT) was evaluated using the PEDro scale.

#### **RESULTS:**

Twenty-eight studies involving 39,166 participants met the inclusion criteria. Four studies, including 5 pair-wise comparisons, were included in the meta-analysis: Three were cohort studies and 1 was a cross-sectional study. The meta-analysis outcome demonstrated a relationship between chronic NSNAP and psychological stress. The estimate odds ratio for all studies combined was 2.33 (95% CI, 1.04-5.18; p=0.039). A high heterogeneity of the findings appeared (Q=28.94, I<sup>2</sup>=86% p=0.00).

#### **CONCLUSION:**

This study shows that there is a strong relationship between stress and chronic NSNAP. Despite this finding, we cannot support that stress is a risk factor for chronic NSNAP due to the low quality of the results according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE). It was not possible to make a quantitative analysis comparing the relationship between anxiety and chronic NSNAP. However, according to the qualitative analysis there is a strong relationship between anxiety and chronic NSNAP

**12 B. CERVICAL SURGERIES****Pre surgical alignment**

Spine (Phila Pa 1976). 2016 Nov 1;41(21):E1265-E1270.

**Effect of Preoperative Sagittal Balance on Cervical Laminoplasty Outcomes.**

Oshima Y<sup>1</sup>, Takeshita K, Taniguchi Y, Matsubayashi Y, Doi T, Ohya J, Soma K, Kato S, Oka H, Chikuda H, Tanaka S.

Author information

Abstract

**STUDY DESIGN:**

Retrospective case series.

**OBJECTIVE:**

To clarify how preoperative global sagittal imbalance influences outcomes in patients with cervical compression myelopathy undergoing cervical laminoplasty.

**SUMMARY OF BACKGROUND DATA:**

The influence of sagittal balance on outcomes of cervical laminoplasty remains uncertain.

**METHODS:**

The authors retrospectively reviewed data of 106 patients who underwent double-door cervical laminoplasty between 2004 and 2011 and investigated the influence of the C7 sagittal vertical axis (SVA) on outcome scores. Primary outcomes used were Japanese Orthopedic Association (JOA) scores, Numerical Rating Scale for neck or arm pain, the Short Form 36 Health Survey (physical and mental component summary scores), and the Neck Disability Index (NDI).

**RESULTS:**

Ninety-two patients with complete data were eligible for inclusion. The preoperative C7 SVA was  $\leq 5$  cm in 64 patients (69.6%) and  $> 5$  cm in 28 (30.4%). We compared each parameter by the magnitude of spinal sagittal balance (preoperative C7 SVA  $> 5$  cm vs. C7 SVA  $\leq 5$  cm) after adjusting for age via the least square mean analysis because the average age was significantly higher in patients with C7 SVA  $> 5$  cm. As for the radiographic parameters, both C2-7 SVA and C7 SVA were larger in patients when the C7 SVA was  $> 5$  cm. Numerical Rating Scale for postoperative arm pain, postoperative JOA scores, and both pre- and postoperative physical component summary and NDI were worse in patients with C7 SVA  $> 5$  cm; however, the JOA score recovery rate and changes in physical component summary and NDI were not significantly different.

**CONCLUSION:**

Postoperative functional outcome scores were significantly lower in patients with C7 SVA  $> 5$  cm, although the improvement after cervical laminoplasty was not greatly affected. The involvement of global sagittal balance and cervical regional alignment should be considered in evaluating surgical outcomes for patients undergoing cervical laminoplasty.

**LEVEL OF EVIDENCE:**

4.

### 13. CRANIUM/TMJ

#### TMD reactions

J Headache Pain. 2016 Dec;17(1):103. Epub 2016 Nov 3.

#### **Chronic Temporomandibular Disorders: disability, pain intensity and fear of movement.**

Gil-Martínez A<sup>1,2</sup>, Grande-Alonso M<sup>3</sup>, López-de-Uralde-Villanueva I<sup>4,3</sup>, López-López A<sup>5,6</sup>, Fernández-Carnero J<sup>4,3,5,7</sup>, La Touche R<sup>4,3</sup>.

Author information

Abstract

#### **BACKGROUND:**

The objective was to compare and correlate disability, pain intensity, the impact of headache on daily life and the fear of movement between subgroups of patients with chronic temporomandibular disorder (TMD).

#### **METHODS:**

A cross-sectional study was conducted in patients diagnosed with chronic painful TMD. Patients were divided into: 1) joint pain (JP); 2) muscle pain (MP); and 3) mixed pain. The following measures were included: Craniomandibular pain and disability (Craniofacial pain and disability inventory), neck disability (Neck Disability Index), pain intensity (Visual Analogue Scale), impact of headache (Headache Impact Test 6) and kinesiophobia (Tampa Scale of Kinesiophobia-11).

#### **RESULTS:**

A total of 154 patients were recruited. The mixed pain group showed significant differences compared with the JP group or MP group in neck disability ( $p < 0.001$ ,  $d = 1.99$ ; and  $p < 0.001$ ,  $d = 1.17$ ), craniomandibular pain and disability ( $p < 0.001$ ,  $d = 1.34$ ; and  $p < 0.001$ ,  $d = 0.9$ , respectively), and impact of headache ( $p < 0.001$ ,  $d = 1.91$ ; and  $p < 0.001$ ,  $d = 0.91$ , respectively). In addition, significant differences were observed between JP group and MP group for impact of headache ( $p < 0.001$ ,  $d = 1.08$ ). Neck disability was a significant covariate (37 % of variance) of craniomandibular pain and disability for the MP group ( $\beta = 0.62$ ;  $p < 0.001$ ). In the mixed chronic pain group, neck disability ( $\beta = 0.40$ ;  $p < 0.001$ ) and kinesiophobia ( $\beta = 0.30$ ;  $p = 0.03$ ) were significant covariate (33 % of variance) of craniomandibular pain and disability.

#### **CONCLUSION:**

Mixed chronic pain patients show greater craniomandibular and neck disability than patients diagnosed with chronic JP or MP. Neck disability predicted the variance of craniofacial pain and disability for patients with MP. Neck disability and kinesiophobia predicted the variance of craniofacial pain and disability for those with chronic mixed pain.

**Sleep apnea and liver damage**

Clin Gastroenterol Hepatol. 2016 Nov;14(11):1657-1661. doi: 10.1016/j.cgh.2016.04.037. Epub 2016 May 5.

**Association Between Severity of Obstructive Sleep Apnea and Blood Markers of Liver Injury.**

Trzepizur W<sup>1</sup>, Boursier J<sup>2</sup>, Mansour Y<sup>3</sup>, Le Vaillant M<sup>4</sup>, Chollet S<sup>5</sup>, Pigeanne T<sup>6</sup>, Bizieux-Thaminy A<sup>7</sup>, Humeau MP<sup>8</sup>, Alizon C<sup>9</sup>, Goupil F<sup>10</sup>, Meslier N<sup>11</sup>, Priou P<sup>11</sup>, Calès P<sup>2</sup>, Gagnadoux F<sup>11</sup>; Institut de Recherche en Santé Respiratoire des Pays de la Loire Sleep Cohort Group.

Collaborators (14)

Author information

**Abstract**

Obstructive sleep apnea (OSA) may contribute to the development of nonalcoholic fatty liver disease. We performed a multisite cross-sectional study to evaluate the association between the severity of OSA and blood markers of liver steatosis (using the hepatic steatosis index), cytolysis (based on alanine aminotransferase activity), and significant liver fibrosis (based on the FibroMeter [Echosens] nonalcoholic fatty liver disease score) in 1285 patients with suspected OSA in France. After adjusting for confounders including central obesity, the risk of liver steatosis increased with the severity of OSA (P for trend < .0001) and sleep-related hypoxemia (P for trend < .0003 for mean oxygen saturation). Decreasing mean oxygen saturation during sleep also was associated independently with a higher risk of liver cytolysis (P for trend < .0048). Severe OSA conferred an approximate 2.5-fold increase in risk for significant liver fibrosis compared with patients without OSA, but the association between OSA severity and liver fibrosis was not maintained after adjusting for confounders.

### TMJ and other problems

#### Original Article

Association between temporomandibular disorders and pain in other regions of the body

#### Authors

**Leticia Ladeira Bonato, alquiria Quinelato, Patrícia Cataldo de Felipe Cordeiro, Eduardo Branco de Sousa, Ricardo Tesch, Priscila Ladeira Casado**

#### Abstract

The pain from temporomandibular disorder (TMD) is often associated on physical symptoms of other chronic pain disorders and comorbidities, such as generalized muscle and joint pain. However, this association is not widely studied.

#### Objective

To evaluate the prevalence of comorbid pain in joints, specifically in the the knees, hips, ankles, shoulders, wrists and elbows, in individuals with and without TMD.

#### Materials and method

We evaluated 337 patients from a public hospital in the city of Rio de Janeiro, Brazil. The Research Diagnostic Criteria for TMD questionnaire was used for the diagnosis of TMD. To assess the presence of other joint pain, the patients were asked to answer questions considering: the presence of pain in the knee, hip, ankle, shoulder, wrist and elbow joints and time duration of pain.

#### Results

Individuals with TMD are 5.5 times more likely to present with other joint pain compared with those without the disorder. TMD muscle disorders were the most associated with a higher number of pain at the other locations. There was a significant association between the presence of pain at the other locations, muscle ( $p < 0.001$ ) and joint disorders ( $p = < 0.001$ ); as well as age advance, in TMD participants, showed to be a covariate factor for pain at the other locations.

#### Conclusion

Individuals with TMD showed a high prevalence of pain in other joints of the body when compared to individuals without the disorder, and knee pain was the most prevalent pain complaint

## Oral health

nt J Cancer. 2016 Oct 25. doi: 10.1002/ijc.30484.

**Poor oral health is associated with an increased risk of esophageal squamous cell carcinoma - a population-based case-control study in China.**

Chen X<sup>1,2,3</sup>, Yuan Z<sup>2,3</sup>, Lu M<sup>4,5</sup>, Zhang Y<sup>2</sup>, Jin L<sup>2,3</sup>, Ye W<sup>1,3</sup>.  
Author information

**Abstract**

To further examine the association between oral hygiene and esophageal squamous cell carcinoma (ESCC) risk and the effect modification of other exposures, we conducted a population-based case-control study between 2010 and 2012 in Taixing, China, a high-risk area for ESCC. Cases were primarily recruited from endoscopy units at local hospitals, supplemented by linkage to the local Cancer Registry. Control subjects were frequency matched to cases by sex and age (5-year groups) and were randomly selected from the Taixing Population Registry. For the current analysis, data from 616 histopathologically confirmed cases and 770 controls with complete information on oral hygiene were analyzed. Unconditional logistic regression models, including oral hygiene indicators and potential behavioral confounders, were used to derive odds ratios (ORs) and 95% confidence intervals (CIs). Tooth loss was only marginally significantly associated with ESCC risk (yes vs no, OR=1.29, 95% CI 0.94-1.74). However, the excess risk increased with increasing numbers of lost teeth (more than 6 teeth lost vs none, OR=1.48, 95% CI 1.04-2.11). Tooth brushing once or less per day, compared with tooth brushing twice or more per day, was associated with a 1.81-fold increased risk of ESCC. In the stratification analyses, the increased risks associated with these indicators of oral health were more pronounced in older subjects (age  $\geq$  70 years), women, non-smokers, and non-drinkers. Further studies are warranted to verify these findings and to explore the underlying mechanisms, e.g., changed oral microbiota, associated with poor oral hygiene. This article is protected by copyright. All rights reserved.

### 14. HEADACHES

#### Increase risk of stroke in females

#### **Migraine linked to increased stroke risk in women**

American Heart Association News, 11/17/2016

**W**omen who have migraines may have an increased risk of stroke, according to a preliminary study presented at the American Heart Association's Scientific Sessions 2016.

Researchers studied 917 women who were being evaluated for heart disease and found those that had a history of migraines (224 or nearly 25 percent) were at higher risk of a future cardiovascular event – notably stroke.

They also found:

- Compared to those who did not report a history of migraines, women with a history of the headaches had an 83 percent higher risk of a cardiovascular event, including stroke or heart attack, during an average six-year follow-up.
- Women with history of migraine were 2.33 times more likely to suffer a stroke during the study than women who didn't report migraines

**19. GLENOHUMERAL/SHOULDER****Central sensitization**

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

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

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

Author information

Abstract

**BACKGROUND:**

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

**METHODS:**

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

**RESULTS:**

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

**CONCLUSION:**

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

**32 A. KNEE/ACL****Reinjury**

Orthop J Sports Med. 2016 Oct 27;4(10):2325967116669708. eCollection 2016.

**No Association Between Return to Play After Injury and Increased Rate of Anterior Cruciate Ligament Injury in Men's Professional Soccer.**

Lundblad M<sup>1</sup>, Waldén M<sup>2</sup>, Hägglund M<sup>3</sup>, Ekstrand J<sup>2</sup>, Thomeé C<sup>4</sup>, Karlsson J<sup>1</sup>.  
Author information

## Abstract

**BACKGROUND:**

Studies have shown that previous injury, not necessarily anatomically related, is an important injury risk factor. However, it is not known whether a player runs an increased risk of anterior cruciate ligament (ACL) injury after returning to play from other injury types.

**PURPOSE:**

To analyze whether professional soccer players are more susceptible to ACL injury after returning to play from any previous injury.

**STUDY DESIGN:**

Case-control study; Level of evidence, 3.

**METHODS:**

A total of 101 elite male soccer players suffering a first-time complete ACL injury between 2001 and 2014 were included and matched according to team, age, and playing position with control players who did not have a current injury (1:1 match). For each injured player, the 90-day period prior to the ACL injury was analyzed for injuries and compared with that of control players by using odds ratios (ORs) and 95% CIs.

**RESULTS:**

The odds of a player with an ACL injury sustaining a previous injury in the 90-day period did not differ significantly from that of controls (OR, 1.20; 95% CI, 0.66-2.17;  $P = .65$ ). Testing the frequency of absence periods due to injury between the groups revealed that the odds of a player with an ACL injury having a previous period of absence due to injury did not differ compared with controls (OR, 1.14; 95% CI, 0.64-2.01;  $P = .77$ ).

**CONCLUSION:**

Players with ACL injury did not have a greater occurrence of absence due to injury in the 3 months preceding their ACL injury compared with matched controls. This indicates that previous injury of any type does not increase the risk of suffering an ACL injury.

**Rehabilitation**

Br J Sports Med. 2016 Aug 18. pii: bjsports-2015-095898. doi: 10.1136/bjsports-2015-095898.

**Evidence-based clinical practice update: practice guidelines for anterior cruciate ligament rehabilitation based on a systematic review and multidisciplinary consensus.**

van Melick N<sup>1</sup>, van Cingel RE<sup>2</sup>, Brooijmans F<sup>3</sup>, Neeter C<sup>4</sup>, van Tienen T<sup>5</sup>, Hullegie W<sup>6</sup>, Nijhuis-van der Sanden MW<sup>7</sup>.

Author information

Abstract

**AIM:**

The Royal Dutch Society for Physical Therapy (KNGF) instructed a multidisciplinary group of Dutch anterior cruciate ligament (ACL) experts to develop an evidence statement for rehabilitation after ACL reconstruction.

**DESIGN:**

Clinical practice guideline underpinned by systematic review and expert consensus.

**DATA SOURCES:**

A multidisciplinary working group and steering group systematically reviewed the literature and wrote the guideline. MEDLINE and the Cochrane Library were searched for meta-analyses, systematic reviews, randomised controlled trials and prospective cohort studies published between January 1990 and June 2015.

**ELIGIBILITY CRITERIA FOR SELECTING STUDIES:**

Included literature must have addressed 1 of 9 predetermined clinical topics: (1) preoperative predictors for postoperative outcome, (2) effectiveness of physical therapy, (3) open and closed kinetic chain quadriceps exercises, (4) strength and neuromuscular training, (5) electrostimulation and electromyographic feedback, (6) cryotherapy, (7) measurements of functional performance, (8) return to play and (9) risk for reinjury.

**SUMMARY:**

Ninety studies were included as the basis for the evidence statement. Rehabilitation after ACL injury should include a prehabilitation phase and 3 criterion-based postoperative phases: (1) impairment-based, (2) sport-specific training and (3) return to play. A battery of strength and hop tests, quality of movement and psychological tests should be used to guide progression from one rehabilitation stage to the next. Postoperative rehabilitation should continue for 9-12 months. To assess readiness to return to play and the risk for reinjury, a test battery, including strength tests, hop tests and measurement of movement quality, should be used.

### 33. MENISCUS

#### Posterior horn and OA

Osteoarthritis Cartilage. 2016 Nov 9. pii: S1063-4584(16)30370-3. doi: 10.1016/j.joca.2016.10.025.

#### **Cross-sectional and Longitudinal Study of the Impact of Posterior Meniscus Horn Lesions on Adjacent Cartilage Composition, Patient-Reported Outcomes and Gait Biomechanics in Subjects without Radiographic Osteoarthritis.**

Russell C<sup>1</sup>, Pedroia V<sup>2</sup>, Souza RB<sup>3</sup>, Majumdar S<sup>4</sup>.

Author information

Abstract

#### **OBJECTIVE:**

The aim of this study was to assess cross-sectional and longitudinal effects of meniscal lesions on adjacent cartilage T<sub>1ρ</sub> and T<sub>2</sub> relaxation times, patient-reported outcomes and gait biomechanics.

#### **DESIGN:**

30 patients with no cartilage morphological defects reported by WORMS MRI grading and no radiographic osteoarthritis (KL≤1) were selected, 15 with posterior meniscus horn lesions and 15 matched controls without meniscal lesions. All were imaged on a 3T MR scanner for three consecutive years, except those who dropped from the study. Sagittal and frontal plane kinematic gait data were acquired at baseline. The Knee Injury and Osteoarthritis Outcome Score (KOOS) survey was taken each time. All images were automatically segmented and registered to an atlas for voxel-by-voxel cross-sectional and longitudinal analyses.

#### **RESULTS:**

Relaxation time comparisons between groups showed elevated T<sub>1ρ</sub> of the lateral tibia and elevated T<sub>2</sub> of the medial and lateral tibia at one and two years in the lesion group. Longitudinal comparisons within each group revealed greater relaxation time elevations over one and two years in the group with lesions. KOOS Quality of Life was significantly different between the groups at all time points (p<0.05), as were other KOOS subcategories. No significant differences in the frontal or sagittal biomechanics were observed between the groups at baseline.

#### **CONCLUSIONS:**

Individuals with healthy cartilage and posterior meniscal horn lesions have increased relaxation times when compared to matched controls, increased relaxation time changes over two years, and consistently report a lower KOOS Quality of Life, yet show no difference in gait biomechanics.

**34. PATELLA****PFP and insoles**

Knee. 2016 Nov 4. pii: S0968-0160(16)30158-2. doi: 10.1016/j.knee.2016.09.016.

**Immediate effects of foot orthoses on pain during functional tasks in people with patellofemoral osteoarthritis: A cross-over, proof-of-concept study.**

Collins NJ<sup>1</sup>, Hinman RS<sup>2</sup>, Menz HB<sup>3</sup>, Crossley KM<sup>4</sup>.  
Author information

## Abstract

**BACKGROUND:**

The purpose of the study was to determine whether prefabricated foot orthoses immediately reduce pain during functional tasks in people with patellofemoral osteoarthritis, compared to flat insoles and shoes alone.

**METHODS:**

Eighteen people with predominant lateral patellofemoral osteoarthritis (nine women; mean [SD] age 59 [10]years; body mass index 27.9 [3.2]kg/m<sup>2</sup>) performed functional tasks wearing running sandals, and then wearing foot orthoses and flat insoles (random order). Participants rated knee pain during each task (11-point numerical rating scales), ease of performance and knee stability (five-point Likert scales), and comfort (100mm visual analogue scales).

**RESULTS:**

Compared to shoes alone, foot orthoses ( $p=0.002$ ; median difference 1.5 [IQR 3]) and flat insoles ( $p<0.001$ ; 2 [3]) significantly reduced pain during step-downs; foot orthoses reduced pain during walking ( $p=0.008$ ; 1 [1.25]); and flat insoles reduced pain during stair ambulation ( $p=0.001$ ; 1 [1.75]). No significant differences between foot orthoses and flat insoles were observed for pain severity, ease of performance or knee stability. Foot orthoses were less comfortable than flat insoles and shoes alone ( $p<0.05$ ).

**CONCLUSIONS:**

In people with patellofemoral osteoarthritis, immediate pain-relieving effects of prefabricated, contoured foot orthoses are equivalent to flat insoles. Further studies should investigate whether similar outcomes occur with longer-term wear or different orthosis designs.

### 35. KNEE/TOTAL

#### Downsides of

#### **The negatives of knee replacement surgery: complications and the dissatisfied patient**

Henry Dushan Edward Atkinson

#### **Abstract**

Total knee replacement (TKR) surgery is a very effective treatment option for patients with disabling and severe end-stage knee pain. It is usually life-changing surgery and most patients report improvements in outcome measures scoring pain, function and quality of life. However, around 14%–53% of TKR patients have some level of persisting knee pain, 7%–50% of TKR patients report poor knee function, and mean published dissatisfaction rates range between 15% and 30%.

This article reviews the negatives of knee replacement surgery, covering the risks of potential complications and the factors that should routinely be discussed in detail with patients as part of the informed consent process.

**Keywords:** clinical outcomes, complications, dissatisfaction, primary total knee replacement, risks, satisfaction

**Sensitization**

Eur J Pain. 2016 Nov;20(10):1612-1621. doi: 10.1002/ejp.878. Epub 2016 Mar 31.

**The effects of total knee replacement and non-surgical treatment on pain sensitization and clinical pain.**

Skou ST<sup>1,2,3,4</sup>, Roos EM<sup>5</sup>, Simonsen O<sup>6,7,8</sup>, Laursen MB<sup>6,7,8</sup>, Rathleff MS<sup>7</sup>, Arendt-Nielsen L<sup>7</sup>, Rasmussen S<sup>6,7,8</sup>.

Author information

Abstract

**BACKGROUND:**

The objective was to compare the effect of total knee replacement (TKR) followed by a 3-month non-surgical treatment with the non-surgical treatment alone in reducing pain sensitization and other pain-related measures in patients with knee osteoarthritis.

**METHODS:**

One hundred patients were randomized to (1) TKR followed by a non-surgical treatment of neuromuscular exercise, education, diet, insoles and pain medication or (2) the non-surgical treatment alone. Outcomes assessed at baseline and after 3 months were as follows: (1) pain sensitization assessed as pressure-pain thresholds (PPTs) at the knee (localized sensitization) and the lower leg (spreading sensitization), (2) peak pain intensity during the previous 24 h, (3) pain intensity after 30 min of walking, (4) pain location and pattern, (5) spreading of pain on a region-divided body chart and (6) the usage of pain medication.

**RESULTS:**

There was a statistical significant mean difference (95% CI) in change in PPTs from baseline to 3 months between groups in the crude analysis of 71 kPa (21-121) and of 75 kPa (33-117) when adjusting for baseline PPT, age, gender and body mass index, favouring the group having TKR. There were no significant between-group differences in change in the pain-related measures from baseline to 3 months ( $p = 0.15-0.27$ ). Both groups improved in most of the pain-related measures ( $p < 0.05$ ).

**CONCLUSIONS:**

At 3 months, TKR followed by non-surgical treatment is more effective in reducing localized and spreading pain sensitization than non-surgical treatment alone. Both treatments are equally efficacious in reducing the pain-related measures of this study. **WHAT DOES THIS STUDY ADD?:** Knee replacement followed by non-surgical treatment is more effective in reducing pain sensitization, but not other pain-related measures, as compared to non-surgical treatment alone at 3 months.

**37. OSTEOARTHRITIS/KNEE****Leg press**

Knee. 2016 Nov 4. pii: S0968-0160(16)30141-7. doi: 10.1016/j.knee.2016.08.010.

**The contribution of leg press and knee extension strength and power to physical function in people with knee osteoarthritis: A cross-sectional study.**

Tevald MA<sup>1</sup>, Murray AM<sup>2</sup>, Luc B<sup>3</sup>, Lai K<sup>4</sup>, Sohn D<sup>5</sup>, Pietrosimone B<sup>6</sup>.  
Author information

**Abstract**

The purposes of this study were to 1) determine the additional contributions of leg press and knee extensor power, over and above that of strength, to the performance of physical function tasks in people with knee osteoarthritis, and 2) compare the ability of bilateral leg press to unilateral knee extensor strength and power to predict functional task performance.

***METHODS:***

A cross-sectional, exploratory study of 40 individuals with tibiofemoral knee osteoarthritis resulting in moderate impairments in physical function was conducted. Physical function (Get-up and Go, timed stair climb and descent, and five time chair rise) and muscle performance (leg press and knee extension strength and power) were assessed.

***RESULTS:***

After controlling for covariates and strength, leg press, but not knee extensor, power explained additional variance in physical function (11% and 21%). Conversely, adding strength to regression models including covariates and power did not consistently improve the prediction of physical function. Additionally, leg press power consistently explained more variance in physical function (44 to 57%) than involved (24 to 34%) or uninvolved (28 to 48%) knee extension power.

***CONCLUSIONS:***

Leg press power may be a more functionally relevant measure of muscle performance than knee extension strength in this population. Future studies should investigate the effectiveness of interventions specifically designed to improve leg press power in people with knee osteoarthritis.

**41 A. ACHILLES TENDON AND CALF****Surgery vs. non-surgery****Is surgical intervention more effective than non-surgical treatment for acute Achilles tendon rupture? A systematic review of overlapping meta-analyses**

Yaohong Wu<sup>1</sup> Linghan Lin<sup>1</sup> Hao Li<sup>1</sup> Yachao Zhao Longgang Liu Zhiwei Jia  
Deli Wang Qing He Dike Ruan

**Highlights**

- Rehabilitation protocol may influence relative effects of surgical and non-surgical treatments for acute Achilles tendon rupture.
- Centers offering functional rehabilitation may prefer non-surgical intervention.
- Surgical treatment may be preferred at centers that do not have functional rehabilitation.

**Abstract****Objective**

There is discordance in the results from meta-analyses on surgical versus non-surgical treatment for acute Achilles tendon rupture. We systematically reviewed the overlapping meta-analyses on this topic to provide information that will be helpful to decision makers when selecting treatments based on the current best available evidence.

**Methods**

We comprehensively searched multiple databases for systematic reviews that compared surgical and non-surgical treatments for acute Achilles tendon rupture. We only included meta-analyses that comprised randomized controlled trials (RCTs). The methodological quality and extracted data were assessed. The meta-analysis that offered the best evidence was ascertained with the Jadad decision algorithm.

**Results**

Nine meta-analyses were included in our study and all of them included RCTs with Level-II evidence. Assessment of Multiple Systematic Reviews (AMSTAR) scores ranged from 5 to 10 (median 7). The Jadad decision algorithm was used to select a high-quality meta-analysis with more RCTs. The results from this study showed that when functional rehabilitation was used, non-surgical intervention was similar to surgical treatment regarding the incidence of range of motion, rerupture, calf circumference and functional outcomes, and the incidence of other complications was reduced. Non-surgical intervention significantly increased the rerupture rate if functional rehabilitation was not considered.

**Conclusions**

The findings of meta-analyses regarding surgical versus non-surgical treatment for acute Achilles tendon rupture are inconsistent. According to this systematic review of overlapping meta-analyses, the current best available evidence suggests that centers offering functional rehabilitation may prefer non-surgical intervention. Surgical treatment may be preferred at centers that do not have functional rehabilitation.

**45 B. MANUAL THERAPY CERVICAL****Dissection and manipulation**

Chiropr Man Therap. 2016 Nov 5;24:43. eCollection 2016.

**Does case misclassification threaten the validity of studies investigating the relationship between neck manipulation and vertebral artery dissection stroke? No.**

Murphy DR<sup>1</sup>, Schneider MJ<sup>2</sup>, Perle SM<sup>3</sup>, Bise CG<sup>4</sup>, Timko M<sup>5</sup>, Haas M<sup>6</sup>.

**BACKGROUND:**

The purported relationship between cervical manipulative therapy (CMT) and stroke related to vertebral artery dissection (VAD) has been debated for several decades. A large number of publications, from case reports to case-control studies, have investigated this relationship. A recent article suggested that case misclassification in the case-control studies on this topic resulted in biased odds ratios in those studies.

**DISCUSSION:**

Given its rarity, the best epidemiologic research design for investigating the relationship between CMT and VAD is the case-control study. The addition of a case-crossover aspect further strengthens the scientific rigor of such studies by reducing bias. The most recent studies investigating the relationship between CMT and VAD indicate that the relationship is not causal. In fact, a comparable relationship between vertebral artery-related stroke and visits to a primary care physician has been observed. The statistical association between visits to chiropractors and VAD can best be explained as resulting from a patient with early manifestation of VAD (neck pain with or without headache) seeking the services of a chiropractor for relief of this pain. Sometime after the visit the patient experiences VAD-related stroke that would have occurred regardless of the care received. This explanation has been challenged by a recent article putting forth the argument that case misclassification is likely to have biased the odds ratios of the case-control studies that have investigated the association between CMT and vertebral artery related stroke. The challenge particularly focused on one of the case-control studies, which had concluded that the association between CMT and vertebral artery related stroke was not causal. It was suggested by the authors of the recent article that misclassification led to an underestimation of risk. We argue that the information presented in that article does not support the authors' claim for a variety of reasons, including the fact that the assumptions upon which their analysis is based lack substantiation and the fact that any possible misclassification would not have changed the conclusion of the study in question.

**CONCLUSION:**

Current evidence does not support the notion that misclassification threatens the validity of recent case-control studies investigating the relationship between CMT and VAD. Hence, the recent re-analysis cannot refute the conclusion from previous studies that CMT is not a cause of VAD.

CPR not effective at this time

## Clinical prediction rules for prognosis and treatment prescription in neck pain: A systematic review

Joan Kelly Carrie Ritchie Michele Sterling

DOI: <http://dx.doi.org/10.1016/j.math.2016.10.066>

### Highlights

- 15 prognostic and 11 prescriptive clinical prediction rules (CPRs) were identified.
- Most CPRs are at the initial stage of development.
- Four prognostic CPRs have undergone initial validation.
- Further validation and impact analyses of all neck pain CPRs are recommended.

### Abstract

Clinical prediction rules (CPRs) developed to identify sub-groups of people with neck pain for different prognoses (i.e. prognostic) or response to treatments (i.e. prescriptive) have been recommended as a research priority to improve health outcomes for these conditions. A systematic review was undertaken to identify prognostic and prescriptive CPRs relevant to the conservative management of adults with neck pain and to appraise stage of development, quality and readiness for clinical application. Six databases were systematically searched from inception until 4th July 2016. Two independent reviewers assessed eligibility, risk of bias (PEDro and QUIPS), methodological quality and stage of development. 9840 records were retrieved and screened for eligibility. Thirty-two studies reporting on 26 CPRs were included in this review. Methodological quality of included studies varied considerably. Most prognostic CPR development studies employed appropriate designs. However, many prescriptive CPR studies (n = 12/13) used single group designs and/or analysed controlled trials using methods that were inadequate for identifying treatment effect moderators. Most prognostic (n = 11/15) and all prescriptive (n = 11) CPRs have not progressed beyond the derivation stage of development. Four prognostic CPRs relating to acute whiplash (n = 3) or non-traumatic neck pain (n = 1) have undergone preliminary validation. No CPRs have undergone impact analysis. Most prognostic and prescriptive CPRs for neck pain are at the initial stage of development and therefore routine clinical use is not yet supported. Further validation and impact analyses of all CPRs are required before confident conclusions can be made regarding clinical utility.

**45 D. MANUAL THERAPY EXTREMITIES****MWM for shoulder impingement**

J Manipulative Physiol Ther. 2016 Nov 6. pii: S0161-4754(16)30008-2. doi: 10.1016/j.jmpt.2016.08.001.

**Immediate Effects of Mobilization With Movement vs Sham Technique on Range of Motion, Strength, and Function in Patients With Shoulder Impingement Syndrome: Randomized Clinical Trial.**

Guimarães JF<sup>1</sup>, Salvini TF<sup>1</sup>, Siqueira AL Jr<sup>1</sup>, Ribeiro IL<sup>1</sup>, Camargo PR<sup>1</sup>, Albuquerque-Sendín F<sup>2</sup>.  
Author information

Abstract

**OBJECTIVE:**

The purpose of this study was to compare the immediate effects of mobilization with movement (MWM) with sham technique on range of motion (ROM), muscle strength, and function in patients with shoulder impingement syndrome.

**METHODS:**

A randomized clinical study was performed. Participants (mean age  $\pm$  standard deviation, 31  $\pm$  8 years; 56% women) were divided into 2 groups: group 1 (n = 14), which received the MWM technique in the first 4 sessions and the sham technique in the last 4 sessions; and group 2 (n = 13), which was treated with the opposite order of treatment conditions described for group 1. Shoulder ROM, isometric peak force assessed with a handheld dynamometer, and function as determined through the Disabilities of the Arm, Shoulder and Hand and Shoulder Pain and Disability Index (SPADI) questionnaires were collected at preintervention, interchange, and postintervention moments.

**RESULTS:**

Two-way analysis of variance revealed no significant group-by-time interaction for any outcome but did reveal a main time effect for shoulder external rotation (P = .04) and abduction (P = .01) ROM, Disabilities of the Arm, Shoulder and Hand (P < .01), SPADI Pain (P < .01), SPADI Function (P < .01), and SPADI Total (P < .01). Only abduction movement and SPADI Pain overcame the clinical relevance threshold. The isometric peak force tests revealed no effects.

**CONCLUSION:**

The MWM technique was no more effective than a sham intervention in improving shoulder ROM during external rotation and abduction, pain, and function in patients with shoulder impingement syndrome.

**46 A. UPPER LIMB NEUROMOBILIZATION****Scalene's width****Reference Values for the Scalene Interval Width During Varying Degrees of Glenohumeral Abduction Using Ultrasonography**

Ross Mattox, DC Patrick J. Battaglia, DC Aaron B. Welk, DC Yumi Maeda, DDS, PhD  
Daniel W. Haun, DC Norman W. Kettner, DC

**Objective**

The aim of this study was to establish reference values for the width of the interval between the anterior and middle scalene muscles using ultrasonography during varying degrees of glenohumeral joint (GH) abduction. Reliability and body mass index (BMI) data were also assessed.

**Methods**

Interscalene triangles of asymptomatic participants were scanned bilaterally in the transverse plane. Images were obtained at 0°, 90°, and 150° of GH abduction with the participant seated. Width measurements were taken between the anterior and middle scalene muscle borders by bisecting the C6 nerve root as it passed superficial to the posterior tubercle of the C7 transverse process. Intra- and interexaminer reliability and BMI correlation were studied. Statistical significance was defined as  $P \leq .05$ .

**Results**

Images of 42 scalene intervals were included from 21 participants (11 female). Mean participant age was  $25.3 \pm 3.9$  years; mean BMI was  $25.4 \pm 2.7$  kg/m<sup>2</sup>. Scalene interval measurements at 0°, 90°, and 150° of GH abduction were  $4.5 \pm 0.5$  mm,  $4.6 \pm 0.5$  mm, and  $4.4 \pm 0.7$  mm, respectively, without a significant difference ( $P = .07$ ). Intraexaminer reliability was excellent (0°: intraclass correlation coefficient [ICC] = 0.82; 90°: ICC = 0.89; 150°: ICC = 0.90). Interexaminer reliability was good to excellent (0°: ICC = 0.59; 90°: ICC = 0.85; 150°: ICC = 0.89). Body mass index was positively correlated only at 0° of GH abduction.

**Conclusions**

This study establishes previously unreported reference ultrasonography values for the width of the scalene interval. Intraexaminer reliability was excellent at all glenohumeral positions, and interexaminer reliability was determined to be good to excellent. Body mass index was positively correlated only at 0° of GH abduction.

**Neuromobilization superior**

Clin J Pain. 2016 Nov;32(11):991-1004.

**Does Evidence Support the Use of Neural Tissue Management to Reduce Pain and Disability in Nerve-related Chronic Musculoskeletal Pain?: A Systematic Review With Meta-Analysis.**

Su Y<sup>1</sup>, Lim EC.

**OBJECTIVES:**

In nerve-related chronic musculoskeletal (MS) disorders, neural tissue management is used to relieve pain by balancing the relative movement of neural tissues and their surrounding tissues. To date, there has not been any review evaluating the magnitude of this treatment effect in nerve-related chronic MS pain. The aim of this review was to compare pain and disability in individuals with nerve-related chronic MS pain who were treated with neural tissue management with those who received minimal or other treatment approaches.

**METHODS:**

Searches of 8 major electronic databases were conducted, and data on pain and disability scores were extracted. Meta-analyses (where possible) with either a fixed-effect(s) or random-effect(s) model, standardized mean differences (SMDs), and tests of heterogeneity were performed.

**RESULTS:**

Twenty clinically controlled trials were identified and included in the meta-analyses. When compared with minimal intervention, neural mobilization provided superior pain relief (pooled SMD=-0.77; 95% confidence interval [CI], -1.11 to -0.42; P<0.0001), and reduction in disability (pooled SMD=-1.06; 95% CI, -1.97 to -0.14; P=0.02), after post hoc sensitivity analyses. No significant differences were found when comparing neural mobilization with other treatment approaches for pain (pooled SMD=-0.67; 95% CI, -2.03 to 0.69; P=0.33), after post hoc sensitivity analysis, and disability (pooled SMD=-0.03; 95% CI, -0.54 to 0.59; P=0.93).

**DISCUSSION:**

Neural tissue management is superior to minimal intervention for pain relief and reduction of disability in nerve-related chronic MS pain. Existing evidence does not establish superiority of neural mobilization over other forms of intervention in reducing pain and disability in individuals with nerve-related chronic MS pain.

With Cervical traction

September 2016 Volume 21, Pages 19–28

### **Effectiveness of neural mobilization with intermittent cervical traction in the management of cervical radiculopathy: A randomized controlled trial**

Christos Savva Giannis Giakas Michalis Efstathiou Christos Karagiannis  
Ioannis Mamais

#### **Abstract**

##### **Background**

The effectiveness of both neural mobilization and intermittent cervical traction (ICT) has been previously explored in some studies of generally low methodological quality. However, the effect of simultaneous application of these techniques in people with cervical radiculopathy (CR) has not been previously investigated.

##### **Aim**

To investigate the effect of neural mobilization with simultaneously applied ICT on pain, disability, function, grip strength and cervical range of motion in patients with CR.

##### **Design**

Randomized, controlled, assessor-blinded, clinical trial.

##### **Methods**

Participants (n = 42) diagnosed with unilateral CR were randomly allocated to intervention (neural mobilization combined with ICT, n = 21) or control (n = 21) groups. Participants in the intervention group were asked to attend for 12 treatment sessions to receive 6 sets of 60s grade II–IV ICT with simultaneously applied ‘slider’ neural mobilizations with median nerve bias. Participants randomized to the control group did not receive any type of treatment and were asked to avoid prescription or over-the-counter analgesia or anti-inflammatory medication. The Neck Disability Index (NDI), the Patient-Specific Functional Scale (PSFS), the Numeric Pain Rating Scale (NPRS), and measures of grip strength (GS) and cervical spine active range of motion (CSAROM) were administered at baseline and at 4-weeks.

##### **Results**

The intervention group demonstrated significant improvements in NDI scores (mean difference = -16.95; 95% CI = -22.47 to -11.43, ES = 0.42), PSFS scores (mean difference = 2.88; 95% CI = 2.33 to 3.43, ES = 0.66), NPRS scores (mean difference = -3.74; 95% CI = -4.92 to -2.96, ES = 0.37), GS (mean difference = 1.87 kg; 95% CI = 0.51 to 3.23; ES = 0.07), and CSAROM (except for lateral flexion), compared to the control group where significant changes were not detected.

##### **Conclusion**

Neural mobilization with simultaneous ICT can improve, pain, function, disability, grip strength and cervical range of motion in people with CR. Further clinical trials comparing neural mobilization with cervical traction to other standard interventions are justified.

**48 A. STM****Tensegrity model.**

September 2016 Volume 21, Pages 5–18

**Tensegrity and manual therapy practice: a qualitative study**

David J. Hohenschurz-Schmidt Jorge E. Esteves Oliver P. Thomson

**Background**

Tensegrity has been proposed as a unifying mechanism between structures at cellular, connective tissue and whole body level. Originating in the fields of sculpture and architecture, tensegrity has recently received increasing attention from practitioners and researchers of manual therapy. Notwithstanding this, evidence regarding the role of the tensegrity principle to manual therapy practice is lacking.

**Objective**

This qualitative study explored the conception of tensegrity amongst manual therapy practitioners and how knowledge of the physical principle of tensegrity may influence manual therapy practitioners' clinical decision-making.

**Methods**

Eight semi-structured interviews were conducted with participants from manual therapy, fascia research and/or manual therapy education fields, and analysed using grounded theory methods.

**Results**

Data from this study indicates that tensegrity may inform clinical decision-making in manual therapy. A theory has been constructed that may help to explain aspects of manual therapy practitioners' approaches to tensegrity. Four such approaches to tensegrity were identified and elaborated on.

**Conclusion**

This study suggests that apart from being of importance as a scientific model in the fields of architecture, engineering and biology, tensegrity may also be useful to the practice of manual therapy. Here, tensegrity may serve as a theoretical underpinning of previously conceived clinical models and subjective clinical experience, and may also inform decision-making processes by providing a biomechanical model of the human body.

### Friction massage to popliteal fossa

*J Phys Ther Sci.* 2016 Oct;28(10):2713-2716. Epub 2016 Oct 28.

#### **Effects of friction massage of the popliteal fossa on dynamic changes in muscle oxygenation and ankle flexibility.**

Iwamoto K<sup>1</sup>, Mizukami M<sup>1</sup>, Asakawa Y<sup>1</sup>, Yoshio M<sup>2</sup>, Ogaki R<sup>3</sup>, Takemura M<sup>4</sup>.

[Purpose] This study aimed to examine whether or not friction massage of the popliteal fossa would be effective for achieving dynamic changes in muscle oxygenation and ankle flexibility.

[Subjects and Methods] Twelve healthy male university students participated. Before and after friction massage, dynamic changes in muscle oxygenation and ankle flexibility were measured by near-infrared spectroscopy to evaluate its efficacy. [

Results] Oxygenated hemoglobin was significantly higher after as compared to before massage. The range of ankle dorsiflexion tended to increase after massage.

[Conclusion] These results suggest that friction massage of the popliteal fossa stimulates venous return in the lower leg.

**48 B. TRIGGER POINTS NEEDLING/ACUPUNCTURE****Foot and ankle**

J Manipulative Physiol Ther. 2016 Nov 2. pii: S0161-4754(16)30204-4. doi: 10.1016/j.jmpt.2016.09.002.

**Interrater Reliability in the Clinical Evaluation of Myofascial Trigger Points in Three Ankle Muscles.**

Sanz DR<sup>1</sup>, Lobo CC<sup>2</sup>, López DL<sup>3</sup>, Morales CR<sup>1</sup>, Marín CS<sup>1</sup>, Corbalán IS<sup>4</sup>.  
Author information

Abstract

**OBJECTIVE:**

The purpose of this study was to evaluate interrater reliability in the diagnosis of myofascial trigger points (MTrPs) in the tibialis anterior, peroneus brevis, and extensor digitorum longus muscles.

**METHODS:**

A reliability research study was performed. Three physical therapists with clinical experience in myofascial pain functioned as raters and randomly and bilaterally evaluated the ankles of 40 subjects in the Madrid public health care system. The absence or presence of MTrPs, nodules in taut bands, patterns of referred pain, local twitch response (LTR), and jump-sign were evaluated.

**RESULTS:**

We calculated the pairwise interrater agreement and  $\kappa$ -value concordance of the presence or absence of trigger points (55%-85%;  $\kappa = 0.12$ -0.60), palpable nodules in taut bands (63%-90%;  $\kappa = 0.24$ -0.60), referred pain (63%-85%;  $\kappa = 0.20$ -0.54), and jump sign (62%-89%;  $\kappa = 0.15$ -0.72) in the 3 studied muscles. The LTR could only be evaluated in the tibialis anterior (43%-70%;  $\kappa = 0.05$ -0.21), and evaluation was not possible for the other muscles.

**CONCLUSIONS:**

Three blinded raters were able to reach acceptable pairwise interrater agreement (percentage of agreement value  $\geq 70\%$ ) for the presence or absence of MTrPs and LTR in the tibialis anterior, as well as for nodules in taut bands, referred pain, and the jump sign for the extensor digitorum longus. The peroneus brevis showed a wide percentage of agreement value, ranging from 31% to 82%. The results of this study showed that expert raters can agree, with slight-to-moderate concordance, with regard to the clinical testing of muscle trigger points by direct palpation of the 3 muscles studied: the tibialis anterior, the extensor digitorum longus, and the peroneus brevis. Interrater reliability seems to be muscle dependent, especially with regard to the depth of the muscle.

**51. CFS/BET****Drew in maneuver**

J Phys Ther Sci. 2016 Oct;28(10):2812-2815. Epub 2016 Oct 28.

**The effect of abdominal drawing-in exercise and myofascial release on pain, flexibility, and balance of elderly females.**

Yu SH<sup>1</sup>, Sim YH<sup>2</sup>, Kim MH<sup>3</sup>, Bang JH<sup>4</sup>, Son KH<sup>5</sup>, Kim JW<sup>5</sup>, Kim HJ<sup>5</sup>.

[Purpose] This study is designed to compare the effects of abdominal drawing-in exercise and myofascial release on pain, flexibility, and balance of elderly females.

[Subjects and Methods] Forty elderly females aged 65 or older who had complained of low back pain for three months or longer were selected as the subjects. They were randomly and equally assigned to either an abdominal drawing-in group or a myofascial release group. The subjects conducted exercise three times per week, 40 minutes each time, for eight weeks. As evaluation tools, visual analogue scale for pain, remodified schober test for flexibility, and upright posture with eye opening on hard platform, upright posture with eye closing on hard platform, upright posture with eye opening on soft platform, upright posture with eye closing on soft platform using tetrax for balance were used.

[Results] The abdominal drawing-in exercise group saw significant difference in pain and balance after the exercise compared to before the exercise. The myofascial release group saw significant difference in pain and flexibility after exercise compared to before the exercise.

[Conclusion] The above study showed that abdominal drawing-in exercise affected elderly females regarding pain and balance and myofascial release influenced their pain and flexibility.

**52. EXERCISE****Pilates and LBP**

J Phys Ther Sci. 2016 Oct;28(10):2961-2969. Epub 2016 Oct 28.

**Effects of pilates on patients with chronic non-specific low back pain: a systematic review.**

Lin HT<sup>1</sup>, Hung WC<sup>2</sup>, Hung JL<sup>3</sup>, Wu PS<sup>1</sup>, Liaw LJ<sup>3</sup>, Chang JH<sup>4</sup>.

Author information

**Abstract**

[Purpose] To evaluate the effects of Pilates on patients with chronic low back pain through a systematic review of high-quality articles on randomized controlled trials. [Subjects and Methods] Keywords and synonyms for "Pilates" and "Chronic low back pain" were used in database searches. The databases included PubMed, Physiotherapy Evidence Database (PEDro), Medline, and the Cochrane Library. Articles involving randomized controlled trials with higher than 5 points on the PEDro scale were reviewed for suitability and inclusion. The methodological quality of the included randomized controlled trials was evaluated using the PEDro scale. Relevant information was extracted by 3 reviewers. [Results] Eight randomized controlled trial articles were included. Patients with chronic low back pain showed statistically significant improvement in pain relief and functional ability compared to patients who only performed usual or routine health care. However, other forms of exercise were similar to Pilates in the improvement of pain relief and functional capacity. [Conclusion] In patients with chronic low back pain, Pilates showed significant improvement in pain relief and functional enhancement. Other exercises showed effects similar to those of Pilates, if waist or torso movement was included and the exercises were performed for 20 cumulative hours.

### 54. POSTURE

#### Sling ex improved pelvic angle

J Phys Ther Sci. 2016 Oct;28(10):2789-2792. Epub 2016 Oct 28.

#### **The change of pain and lumbosacral sagittal alignment after sling exercise therapy for patients with chronic low back pain.**

Roh HS1, Cho WJ2, Ryu WJ3, Park SJ2, An CS1.

#### **Abstract**

[Purpose] This study was conducted to quantify the effect of sling exercise therapy in the recovery of lumbosacral sagittal alignment (LSA) and in the control of low back pain.

[Subjects and Methods] A total of 102 chronic low back pain patients were divided into two groups, a physical therapy group and a sling exercise group. In both groups, programs were conducted thrice a week for twelve weeks. With respect to LSA, pelvic tilt (PT), sacral slope (SS), and pelvic incidence (PI) were measured with plain radiography. Pain was measured on a visual analogue scale (VAS).

[Results] Differences were found in visual analogue scale, delta score of visual analogue scale, pelvic tilt, delta score of pelvic tilt, and delta score of pelvic incidence between sling exercise therapy and physical therapy groups. VAS, pelvic tilt, and pelvic incidence was positively changed after sling exercise. However, only the visual analogue scale was found to be improved after physical therapy.

[Conclusion] Sling exercise therapy and physical therapy were effective in reducing pain. However, pelvic tilt and pelvic incidence were positively changed after sling exercise therapy for Lumbosacral Sagittal Alignment, but were unchanged after physical therapy. Therefore, sling exercise therapy is more effective than physical therapy for the recovery of Lumbosacral Sagittal Alignment in patients with chronic low back pain.

### Forwards head

Phys Ther Sci. 2016 Oct;28(10):2929-2932. Epub 2016 Oct 28.

### **Correlation between rounded shoulder posture, neck disability indices, and degree of forward head posture.**

Kim EK1, Kim JS2.

#### **Abstract**

[Purpose] The present study aimed to examine the correlation between rounded shoulder posture, neck disability indices and the degree of forward head posture.

[Subjects and Methods] Subjects aged 19-24 years were selected for this study, and the craniovertebral angle was used to measure the degree of forward head posture in the standing and seated positions. Vernier calipers were used to measure rounded shoulder posture in the supine position, and neck pain and functional disability were assessed using neck disability indices.

[Results] Angle and neck disability indices in both standing and sitting posture positions exhibited a significant inverse relationship. However, no significant correlation was detected between the craniovertebral angle and rounded shoulder posture for the standing and sitting posture positions.

[Conclusion] In conclusion, it was demonstrated in the present study that, depending on the degree of forward head posture, changes were detected in the neck disability indices. However, even an increase in the forward head tilt angle did not lead to rounded shoulder posture. Therefore, maintaining proper posture may prevent postural pain syndrome, functional disability, and postural deformity.

## 55. SCOLIOSIS

### Mobility in scoliosis

Scoliosis Spinal Disord. 2016 Oct 25;11:42. eCollection 2016.

#### **The effect of scoliotic deformity on spine kinematics in adolescents.**

Galvis S<sup>1</sup>, Burton D<sup>2</sup>, Barnds B<sup>2</sup>, Anderson J<sup>3</sup>, Schwend R<sup>3</sup>, Price N<sup>3</sup>, Wilson S<sup>1</sup>, Friis E<sup>1</sup>.

Author information

Abstract

#### **BACKGROUND:**

While adolescent idiopathic scoliosis (AIS) produces well characterized deformation in spinal form, the effect on spinal function, namely mobility, is not well known. Better understanding of scoliotic spinal mobility could yield better treatment targets and diagnoses. The purpose of this study was to characterize the spinal mobility differences due to AIS. It was hypothesized that the AIS group would exhibit reduced mobility compared to the typical adolescent (TA) group.

#### **METHODS:**

Eleven adolescents with right thoracic AIS, apices T6-T10, and eleven age- and gender-matched TAs moved to their maximum bent position in sagittal and coronal plane bending tasks. A Trakstar (Ascension Technologies Burlington, VT) was used to collect position data. The study was approved by the local IRB. Using MATLAB (MathWorks, Natick, MA) normalized segmental angles were calculated for upper thoracic (UT) from T1-T3, mid thoracic (MT) from T3-T6, lower thoracic (LT) from T6-T10, thoracolumbar (TL) from T10-L1, upper lumbar (UL) from L1-L3, and thoracic from T1-L1 by subtracting the standing position from the maximum bent position and dividing by number of motion units in each segment. Mann Whitney tests ( $\alpha = 0.05$ ) were used to determine mobility differences.

#### **RESULTS:**

The findings indicated that the AIS group had comparatively increased mobility in the periapical regions of the spine. The AIS group had an increase of  $1.2^\circ$  in the mid thoracic region ( $p = 0.01$ ) during flexion, an increase of  $1.0^\circ$  in the mid thoracic region ( $p = 0.01$ ),  $1.5^\circ$  in the thoracolumbar region ( $p = 0.02$ ), and  $0.7^\circ$  in thoracic region ( $p = 0.04$ ) during left anterior-lateral flexion, an increase of  $6.0^\circ$  in the upper lumbar region ( $p = 0.02$ ) during right anterior-lateral flexion, and an increase of  $2.2^\circ$  in the upper lumbar region during left lateral bending ( $p < 0.01$ ).

#### **CONCLUSIONS:**

Participants with AIS did not have reduced mobility in sagittal or coronal motion. Contrarily, the AIS group often had a greater mobility, especially in segments directly above and below the apex. This indicates the scoliotic spine is flexible and may compensate near the apex

**58. RUNNING****Plyometrics**

J Strength Cond Res. 2016 Oct 28.

**Acute Effects of Plyometric and Resistance Training on Running Economy in Trained Runners.**

Marcello RT<sup>1</sup>, Greer BK, Greer AE.  
Author information

**Abstract**

Results regarding the acute effects of plyometric and resistance training (PRT) on running economy (RE) are conflicting.

Eight male collegiate distance runners ( $21 \pm 1$  years,  $62.5 \pm 7.8$  ml/kg/min  $\dot{V}O_2$  peak) completed  $\dot{V}O_2$  peak and 1 repetition maximum (1RM) testing. Seven days later, subjects completed a 12 minute RE test at 60% and 80%  $\dot{V}O_2$  peak, followed by a PRT protocol or a rested condition of equal duration (CON). The PRT protocol consisted of 3 sets of 5 repetitions at 85% 1RM for barbell squats, Romanian deadlifts, and barbell lunges; the same volume was utilized for resisted lateral lunges, box jumps, and depth jumps. Subjects completed another RE test immediately following the treatments as well as 24 hours later. Subjects followed an identical protocol six days later with condition assignment reversed. RE was determined by both relative  $\dot{V}O_2$  (ml/kg/min) as well as energy expenditure (kcal/min). There was a significant ( $p < 0.05$ ) between-trial increase in  $\dot{V}O_2$  ( $37.1 \pm 4.2$  ml/kg/min PRT vs.  $35.5 \pm 3.9$  ml/kg/min CON) and energy expenditure ( $11.4 \pm 1.3$  kcal/min PRT vs.  $11.0 \pm 1.4$  kcal/min CON) immediately post-PRT at 60%  $\dot{V}O_2$  peak, but no significant changes were observed at 80%  $\dot{V}O_2$  peak. Respiratory exchange ratio (RER) was significantly ( $p < 0.05$ ) reduced 24 hours post-PRT ( $0.93 \pm 0.0$ ) as compared to the CON trial ( $0.96 \pm 0.0$ ) at 80%  $\dot{V}O_2$  peak.

Results indicate that high intensity PRT may acutely impair RE in aerobically trained individuals at a moderate running intensity, but that the attenuation lasts less than 24 hours in duration.

**59. PAIN****Cannabis and chronic pain**

Clin J Pain. 2016 Dec;32(12):1036-1043.

**The Effect of Medicinal Cannabis on Pain and Quality-of-Life Outcomes in Chronic Pain: A Prospective Open-label Study.**

Haroutounian S<sup>1</sup>, Ratz Y, Ginosar Y, Furmanov K, Saifi F, Meidan R, Davidson E.  
Author information

Abstract

**OBJECTIVES:**

The objective of this prospective, open-label study was to determine the long-term effect of medicinal cannabis treatment on pain and functional outcomes in participants with treatment-resistant chronic pain.

**PATIENTS AND METHODS:**

The primary outcome was the change in the pain symptom score on the S-TOPS (Treatment Outcomes in Pain Survey-Short Form) questionnaire at the 6-month follow-up in an intent-to-treat population. Secondary outcomes included the change in S-TOPS physical, social, and emotional disability scales, the pain severity, and pain interference on the Brief Pain Inventory, sleep problems, and the change in opioid consumption.

**RESULTS:**

A total of 274 participants were approved for treatment; complete baseline data were available for 206 (intent-to-treat), and complete follow-up data for 176 participants. At follow-up, the pain symptom score improved from median 83.3 (95% confidence interval [CI], 79.2-87.5) to 75.0 (95% CI, 70.8-79.2) ( $P<0.001$ ). The pain severity score (7.50 [95% CI, 6.75-7.75] to 6.25 [95% CI, 5.75-6.75]) and the pain interference score (8.14 [95% CI, 7.28-8.43] to 6.71 [95% CI, 6.14-7.14]) improved (both  $P<0.001$ ), together with most social and emotional disability scores. Opioid consumption at follow-up decreased by 44% ( $P<0.001$ ). Serious adverse effects led to treatment discontinuation in 2 participants.

**DISCUSSION:**

The treatment of chronic pain with medicinal cannabis in this open-label, prospective cohort resulted in improved pain and functional outcomes, and a significant reduction in opioid use. Results suggest long-term benefit of cannabis treatment in this group of patients, but the study's noncontrolled nature should be considered when extrapolating the results.

**60. COMPLEX REGIONAL PAIN****Phantom pain****New insights into cause of phantom limb pain may have therapeutic benefits**

Osaka University Research News, 11/18/2016

**P**hantom limb pain was previously thought to be caused by abnormal plasticity in the sensorimotor cortex of the brain, and rehabilitative therapies have focused on restoring normal motor function to relieve the pain. However, conflicting results left the question of whether and how phantom pain is caused by changes in sensorimotor activity unanswered.

In a new study, researchers based at Osaka University reported on their use of brain-machine interface (BMI) training with a robotic hand on 10 phantom limb patients to investigate the association between changes in symptomatic pain and cortical currents during phantom hand movements. The BMI decodes the cortical signals that instruct the affected hand to move. It then converts this decoded phantom hand movement into movement of the robotic neuroprosthesis. Previous research has shown that BMIs can precisely decode hand movements in real time.

Patients were asked to either open the robotic hand or grasp with it. The cortical currents activated by hand movements were measured using magnetoencephalography (MEG) signals. Results were compared with movement of the intact hand to check that motor information obtained from the sensorimotor cortex was specific. As expected, training with the prosthesis partially restored functioning of the affected hand and increased motor activity in the cortex. However, unexpectedly, participants reported a significant increase in the sensation of pain.

This approach provided a method for inducing localized changes in cortical activity and directly and reversibly studying the relationship with pain.

Indeed, when the patients were asked to move the phantom hand based on MEG signals decoded from movement of the intact hand, cortical sensorimotor activity was disrupted, reducing pain. In contrast with what was previously thought, these findings showed that pain is not reduced by reconstruction of motor function but by changes in cortical plasticity.

Five study participants found that BMI training reduced pain more than previous therapies, suggesting that this is a promising approach for treating phantom limb pain. The training also reduced pain from residual surgery in some patients, therefore may be used to treat other chronic pain conditions.

The full research report entitled “Induced sensorimotor brain plasticity controls pain in phantom limb patients” was published in the Nature Communications journal.

## Plasticity

## Research Article

**Normal sensorimotor plasticity in complex regional pain syndrome with fixed posture of the hand**

Francesca Morgante MD, PhD, Antonino Naro MD, PhD, Armen Terranova MD, PhD, Margherita Russo MD, PhD, Vincenzo Rizzo MD, PhD, Giovanni Risitano MD, Paolo Girlanda MD, Angelo Quartarone MD, PhD

## Background

Movement disorders associated with complex regional pain syndrome type I have been a subject of controversy over the last 10 years regarding their nature and pathophysiology, with an intense debate about the functional (psychogenic) nature of this disorder. The aim of this study was to test sensorimotor plasticity and cortical excitability in patients with complex regional pain syndrome type I who developed a fixed posture of the hand.

## Methods

Ten patients with complex regional pain syndrome type I in the right upper limb and a fixed posture of the hand (disease duration less than 24 months) and 10 age-matched healthy subjects were enrolled. The following parameters of corticospinal excitability were recorded from the abductor pollicis brevis muscle of both hands by transcranial magnetic stimulation: resting and active motor thresholds, short-interval intracortical inhibition and facilitation, cortical silent period, and short- and long-latency afferent inhibition. Sensorimotor plasticity was tested using the paired associative stimulation protocol.

## Results

Short-interval intracortical inhibition and long-latency afferent inhibition were reduced only in the affected right hand of patients compared with control subjects. Sensorimotor plasticity was comparable to normal subjects, with a preserved topographic specificity.

## Conclusions

Our data support the view that motor disorder in complex regional pain syndrome type I is not associated with abnormal sensorimotor plasticity, and it shares pathophysiological abnormalities with functional (psychogenic) dystonia rather than with idiopathic dystonia.

## 62 A. NUTRITION/VITAMINS

### Whole grain intake

Whole-grain intake and mortality from all causes, cardiovascular disease, and cancer: A systematic review and dose-response meta-analysis of prospective cohort studies

Advances in Nutrition: An International Review Journal, 11/18/2016

**B**enisi–Kohansal S, et al. – Researchers conducted this study to summarize the connection between whole–grain intake and risk of mortality from all causes, cardiovascular disease, and total and specific cancers. They found an inverse relationship between whole–grain intake and mortality from all causes, cardiovascular disease, and total cancers.

#### Methods

- For this study, a systematic search of the literature published earlier than March 2015 was conducted in Medline and PubMed, SCOPUS, EMBASE, and Cochrane Library to recognize relevant articles.
- After that, prospective cohort studies that analyzed the relationship of total whole-grain intake or specific whole-grain foods with risk of mortality from all causes, cardiovascular disease, and total and specific cancers were considered.
- 20 prospective cohort studies were incorporated in the systematic review: 9 studies reported total whole-grain intake and 11 others reported specific whole-grain food intake.

#### Results

- In a follow-up period of 5.5 to 26 y, there were 191,979 passings (25,595 from cardiovascular disease, 32,746 from total cancers, and 2671 from specific cancers) in 2,282,603 members.
- The data presented in this work showed a greater intake of both total whole grains and specific whole-grain foods was significantly connected with a lower risk of all-cause mortality in the meta-analysis.
- It was also observed in the findings that the pooled RR for all-cause mortality for an expansion of 3 servings total whole grains/d (90 g/d) was 0.83 (95% CI: 0.79, 0.88).
- In addition, total whole-grain intake (0.84; 95% CI: 0.76, 0.93) and specific whole-grain foods (0.82; 95% CI: 0.75, 0.90) were also connected with a decreased risk of mortality from cardiovascular disease.
- The findings demonstrated that each additional 3 servings total whole grains/d was connected with a 25% lower risk of mortality from cardiovascular disease.
- An inverse affiliation was seen between whole-grain intake and risk of mortality from total cancers (0.94; 95% CI: 0.91, 0.98).

## 63. PHARMACOLOGY

### LBP and opioids

#### **Efficacy and tolerability balance of oxycodone/naloxone and tapentadol in chronic low back pain with a neuropathic component: A blinded end point analysis of randomly selected routine data from 12-week prospective open-label observations**

Journal of Pain Research, 11/21/2016 Ueberall MA, et al.

In this study, the researchers aim to assess the benefit–risk profile (BRP) of oxycodone/naloxone (OXN) and tapentadol (TAP) in patients with chronic low back pain (cLBP) with a neuropathic component (NC) in routine clinical practice. The BRP of OXN proved to be noninferior to that of TAP in patients with cLBP–NC in daily practice but demonstrated a superior efficacy if stricter analgesic response definitions were evaluated.

#### Methods

- The researchers conducted a blinded end point analysis of randomly selected 12-week routine/open-label data of the German Pain Registry on adult patients with cLBP–NC who initiated an index treatment in compliance with the current German prescribing information between 1st January and 31st October 2015 (OXN/TAP, n=128/133).
- They defined primary end point as a composite of 3 efficacy components ( $\geq 30\%$  improvement of pain, pain-related disability, and quality of life each at the end of observation vs baseline) and 3 tolerability components (normal bowel function, absence of either central nervous system side effects, and treatment-emergent adverse event [TEAE]-related treatment discontinuation during the observation period) adopted to reflect BRP assessments under real-life conditions.

#### Results

- In this study, demographic as well as baseline and pretreatment characteristics were comparable for the randomly selected data sets of both index groups without any indicators for critical selection biases.
- Treatment with OXN resulted formally in a BRP noninferior to that of TAP and demonstrated an essentially higher primary end point response vs TAP (39.8% vs 25.6%, odds ratio: 1.93;  $P=0.014$ ), due to superior analgesic effects.
- For all 3 efficacy components in favor of OXN, between-group differences increased with stricter response definitions:  $\geq 30\%/ \geq 50\%/ \geq 70\%$  response rates for OXN vs TAP were seen for pain intensity in 85.2%/67.2%/39.1% vs 83.5%/54.1%/15.8% ( $P=$  ns/0.031/ $<0.001$ ), for pain-related disability in 78.1%/64.8%/43.8% vs 66.9%/50.4%/24.8% ( $P=0.043/0.018/0.001$ ), and for quality of life in 76.6%/68.0%/50.0% vs 63.9%/54.1%/34.6% ( $P=0.026/0.022/0.017$ ).
- In general, OXN vs TAP treatments were well tolerated.
- Proportions of patients who either maintained a normal bowel function (68.0% vs 72.2%), reported no central nervous system side effects (91.4% vs 89.5%), or completed the 12-week evaluation period without any TEAE-related treatment discontinuations (93.0% vs 92.5%) were similar for both index medications ( $P=$  ns for each comparison).

### Opioids

Curr Oncol Rep. 2016 Dec;18(12):71.

#### **Opioids and Chronic Pain: Where Is the Balance?**

Davis MP<sup>1</sup>, Mehta Z<sup>2</sup>.

Author information

#### Abstract

Chronic opioid therapy (defined as greater than 3 months on opioids) is a common practice for those with non-cancer pain, cancer survivors with treatment-related pain, and individuals with cancer undergoing disease-modifying therapy with a survival that can be for a year or more. Recent studies have found unique long-term toxicities with opioids which reduce the utility of opioid therapy in chronic pain. The risk of addiction, depression, central hypogonadism, sleep-disordered breathing, impaired wound healing, infections, cognitive impairment, falls, non-vertebral fractures, and mortality are increased in populations on long-term opioids. Factors associated with these risks are related to dose, duration of opioid therapy, type of opioid, and formula (long-acting, short-acting). This state-of-the-art review discusses the risks and benefits of chronic opioid therapy and strategies to increase utility and diminish risks to opioid therapy