

## ABSTRACTS

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## 2. LBP

### Sympathetic involvement

Clin J Pain. 2016 Mar;32(3):226-31. doi: 10.1097/AJP.0000000000000250.

#### **Sympathetic Dysfunction in Patients With Chronic Low Back Pain and Failed Back Surgery Syndrome.**

El-Badawy MA<sup>1</sup>, El Mikkawy DM.

Abstract

##### **BACKGROUND:**

Chronic low back pain (CLBP) is defined as pain that persists longer than 12 weeks and is often attributed to degenerative or traumatic conditions of the spine. Failed back surgery syndrome is a condition in which chronic pain persists after spinal surgery. Electrodiagnostic studies can be used to confirm the diagnosis of lumbosacral radiculopathy, but other diagnostic methods are often needed to assess sympathetic nervous system dysfunction.

##### **OBJECTIVES:**

The aim of this study was to investigate the affection of sympathetic skin response (SSR) in cases of chronic low back pain (LBP) and failed back surgery syndrome (FBSS) and to assess the association of SSR abnormalities with perceived functional disability and pain among these patients.

##### **METHODOLOGY:**

Twenty patients with CLBP and 10 patients with failed FBSS who fulfilled the inclusion criteria were recruited to the present study. All cases had back, leg, or back and leg pain of at least 3-month duration or following spinal surgery. The control group consists of 10 healthy participants matched in age and sex. Electrophysiologic nerve conduction studies and SSR recording were applied on the symptomatic and normal side in study cases and on both sides in the control group. Pain intensity was analyzed by the visual analogue scale (VAS) and perceived functional disability was assessed with the Oswestry disability index (ODI).

##### **CONCLUSIONS:**

It was concluded that the sympathetic nervous system is affected in CLBP and FBSS patients with abnormalities in SSR and that the dysfunction of sympathetic nervous system may contribute to the intensity and chronicity of pain in these groups of patients. Moreover, a strong association was found between SSR and functional disabilities in these patients.

PMID: 25968450

**Kinesiophobia**

J Back Musculoskelet Rehabil. 2016 Jan 14.

**Investigation of the relationship between kinesiophobia, physical activity level and quality of life in patients with chronic low back pain.**

Altuğ F<sup>1</sup>, Ünal A<sup>1</sup>, Kilavuz G<sup>1</sup>, Kavlak E<sup>1</sup>, Çitişli V<sup>2</sup>, Cavlak U<sup>1</sup>.

Abstract

**OBJECTIVE:**

The aim of our study is to examine the relationship between kinesiophobia (fear of movement), physical activity level and quality of life.

**METHODS:**

In this study, we assessed 112 patients consulting for low back pain (LBP) of  $\geq 3$  month's duration. We used Visual Analog Scale (VAS) for pain intensity, the International Physical Activity Questionnaire (IPAQ) for physical activity level, Tampa Kinesiophobia Scale for perception of kinesiophobia, Oswestry Disability Index for disability status of low back.

**RESULTS:**

The results of this study, there was no statistically significant correlation between International Physical Activity Questionnaire, duration of pain, intensity of pain at rest and Tampa Kinesiophobia Scale ( $p > 0.05$ ). It was found a statistically significant correlation between pain intensity at activity ( $p = 0.009$ ), disability level ( $p = 0.000$ ) and Tampa Kinesiophobia Scale. Tampa Kinesiophobia Scale were highly negative correlated with sub-scale of SF-36 Quality of Life Index (general health, physical function, social status, bodily pain, role limitations due to physical health) ( $p = 0.000$ ).

**CONCLUSION:**

The kinesiophobia adversely affect the quality of life limiting the physical activity status of patients with chronic low back pain.

**KEYWORDS:**

Chronic low back pain; Tampa Kinesiophobia Scale; physical activity level; quality of life

PMID: 26836836

## PT and LBP

Br J Sports Med. 2016 Feb;50(4):237-45. doi: 10.1136/bjsports-2015-095058. Epub 2015 Oct 20.

**Individualised physiotherapy as an adjunct to guideline-based advice for low back disorders in primary care: a randomised controlled trial.**

Ford JJ<sup>1</sup>, Hahne AJ<sup>1</sup>, Surkitt LD<sup>1</sup>, Chan AY<sup>1</sup>, Richards MC<sup>1</sup>, Slater SL<sup>1</sup>, Hinman RS<sup>2</sup>, Pizzari T<sup>1</sup>, Davidson M<sup>1</sup>, Taylor NF<sup>1</sup>.

Abstract

**BACKGROUND:**

Many patients with low-back disorders persisting beyond 6 weeks do not recover. This study investigates whether individualised physiotherapy plus guideline-based advice results in superior outcomes to advice alone in participants with low-back disorders.

**METHODS:**

This prospective parallel group multicentre randomised controlled trial was set in 16 primary care physiotherapy practices in Melbourne, Australia. Random assignment resulted in 156 participants receiving 10 sessions of physiotherapy that was individualised based on pathoanatomical, psychosocial and neurophysiological barriers to recovery combined with guideline-based advice, and 144 participants receiving 2 sessions of physiotherapist-delivered advice alone. Primary outcomes were activity limitation (Oswestry Disability Index) and numerical rating scales for back and leg pain at 5, 10, 26 and 52 weeks postbaseline. Analyses were by intention-to-treat using linear mixed models.

**RESULTS:**

Between-group differences showed significant effects favouring individualised physiotherapy for back and leg pain at 10 weeks (back: 1.3, 95% CI 0.8 to 1.8; leg: 1.1, 95% CI 0.5 to 1.7) and 26 weeks (back: 0.9, 95% CI 0.4 to 1.4; leg: 1.0, 95% CI 0.4 to 1.6). Oswestry favoured individualised physiotherapy at 10 weeks (4.7; 95% CI 2.0 to 7.5), 26 weeks (5.4; 95% CI 2.6 to 8.2) and 52 weeks (4.3; 95% CI 1.4 to 7.1). Responder analysis at 52 weeks showed participants receiving individualised physiotherapy were more likely to improve by a clinically important amount of 50% from baseline for Oswestry (relative risk (RR)=1.3) 1.5; 95% CI 1.2 to 1.8) and back pain (RR 1.3; 95% CI 1.2 to 1.8) than participants receiving advice alone.

**CONCLUSIONS:**

10 sessions of individualised physiotherapy was more effective than 2 sessions of advice alone in participants with low-back disorders of  $\geq 6$  weeks and  $\leq 6$  months duration. Between-group changes were sustained at 12 months for activity limitation and 6 months for back and leg pain and were likely to be clinically significant.

**CLINICAL TRIAL REGISTRATION:**

ACTRN12609000834257.

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**KEYWORDS:**

Physiotherapy; Randomised controlled trial

PMID: 26486585

**Inflammatory nature**

Arthritis Rheumatol. 2016 Feb 11. doi: 10.1002/art.39628.

**Two Phenotypes are Identified by Cluster Analysis in Early Inflammatory Back Pain Suggestive of Spondyloarthritis. Results from the Desir Cohort.**

Costantino F<sup>1,2</sup>, Aegerter P<sup>3,4</sup>, Dougados M<sup>5,6</sup>, Breban M<sup>1,2</sup>, D'Agostino MA<sup>1,2</sup>.

Abstract

**OBJECTIVE:**

To examine whether in patients with early inflammatory back pain (IBP) suggestive of spondyloarthritis (SpA), disease manifestations at baseline would combine according to distinguishable ordered phenotypes.

**METHODS:**

Baseline clinical and demographic characteristics, as well as imaging and biological data of patients included in the French multicenter DESIR cohort were analyzed by multiple correspondence analysis and cluster analysis to identify subgroups of patients, based on shared characteristics.

**RESULTS:**

Cluster analysis allowed us to classify the 679 patients of the cohort with no missing data into 2 major groups: one with a predominance of isolated axial manifestations and the other with associated peripheral symptoms. The application of the same analysis to selected subsets of the cohort such as HLA-B27 positive and negative patients, and patients fulfilling the Assessment of SpondyloArthritis international Society classification criteria for axial SpA, resulted again in an optimal division of the samples into 2 recurrent clusters of patients, similar to those observed in the whole cohort.

**CONCLUSION:**

Cluster analysis of SpA manifestations among patients with early IBP highly suggestive of SpA, allowed us to clearly identify at baseline 2 different clinical phenotypes, one with predominant axial, and the other with predominant peripheral manifestations. Ongoing follow up will allow determining whether these clusters may correspond to different severity patterns. This article is protected by copyright. All rights reserved.

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**KEYWORDS:**

ankylosing spondylitis; cluster analysis; inflammatory back pain; spondyloarthritis

PMID: 26866633

## 5. SURGERY

### PT post surgical

Arch Phys Med Rehabil. 2016 Feb;97(2):292-301. doi: 10.1016/j.apmr.2015.09.003. Epub 2015 Sep 25.

#### **Physiotherapy Commenced Within the First Four Weeks Post-Spinal Surgery Is Safe and Effective: A Systematic Review and Meta-Analysis.**

Snowdon M<sup>1</sup>, Peiris CL<sup>2</sup>.

Abstract

#### **OBJECTIVES:**

To determine whether physiotherapy commenced within the first 4 weeks post-spinal surgery is safe and effective.

#### **DATA SOURCES:**

Electronic databases CINAHL, MEDLINE, AMED, PubMed, Embase, and PEDro were searched from the earliest date possible through May 2015. An additional trial was identified through reference list scanning.

#### **STUDY SELECTION:**

Controlled trials evaluating comprehensive physiotherapy rehabilitation commenced within 4 weeks postoperatively compared with a control group receiving no physiotherapy, standard postoperative care, rest, less active physiotherapy, or sham physiotherapy after spinal surgery of a musculoskeletal etiology. Two reviewers independently applied inclusion and exclusion criteria, with disagreements discussed until consensus could be reached. Searching identified 3162 potentially relevant articles, of which 4 trials with 250 participants met the inclusion criteria.

#### **DATA EXTRACTION:**

Data were extracted using a predefined data extraction form. Methodological quality of trials was assessed independently by 2 reviewers using the Downs and Black checklist. Pooled analyses were performed using a random-effects model with inverse variance methods to calculate risk differences and 95% confidence intervals (CIs) (dichotomous outcomes), and standardized mean differences (SMDs) and 95% CIs (continuous outcomes).

#### **DATA SYNTHESIS:**

When compared with no or sham physiotherapy, early comprehensive physiotherapy did not increase the risk of adverse events (risk difference, -.01; 95% CI, -.07 to .05; I(2)=0%). In addition, there is moderate-quality evidence demonstrating a reduction in pain by a moderate and significant amount at 12 weeks (SMD=-.38; 95% CI, -.66 to -.10; I(2)=0%) and at 12+ months (SMD=-.30; 95% CI, -.59 to -.02; I(2)=0%).

#### **CONCLUSIONS:**

Early comprehensive physiotherapy commenced within the first 4 weeks post-spinal surgery does not increase the potential for an adverse event and leads to a moderate, statistically significant reduction in pain when compared with a control group.

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#### **KEYWORDS:**

Discectomy; Laminectomy; Physical therapy modalities; Rehabilitation

PMID: 2640910

## 7. PELVIC ORGANS/WOMAN'S HEALTH

## Mothers fish intake an infant obesity

JAMA Pediatr. 2016 Feb 15. doi: 10.1001/jamapediatrics.2015.4430.

**Fish Intake in Pregnancy and Child Growth: A Pooled Analysis of 15 European and US Birth Cohorts.**

Stratakis N<sup>1</sup>, Roumeliotaki T<sup>2</sup>, Oken E<sup>3</sup>, Barros H<sup>4</sup>, Basterrechea M<sup>5</sup>, Charles MA<sup>6</sup>, Eggesbø M<sup>7</sup>, Forastiere F<sup>8</sup>, Gaillard R<sup>9</sup>, Gehring U<sup>10</sup>, Govarts E<sup>11</sup>, Hanke W<sup>12</sup>, Heude B<sup>6</sup>, Iszatt N<sup>7</sup>, Jaddoe VW<sup>9</sup>, Kelleher C<sup>13</sup>, Mommers M<sup>14</sup>, Murcia M<sup>15</sup>, Oliveira A<sup>5</sup>, Pizzi C<sup>16</sup>, Polanska K<sup>14</sup>, Porta D<sup>10</sup>, Richiardi L<sup>16</sup>, Rifas-Shiman SL<sup>3</sup>, Schoeters G<sup>17</sup>, Sunyer J<sup>18</sup>, Thijs C<sup>14</sup>, Viljoen K<sup>13</sup>, Vrijheid M<sup>19</sup>, Vrijkotte TG<sup>20</sup>, Wijga AH<sup>21</sup>, Zeegers MP<sup>22</sup>, Kogevinas M<sup>23</sup>, Chatzi L<sup>2</sup>.

Abstract

**IMPORTANCE:** Maternal fish intake in pregnancy has been shown to influence fetal growth. The extent to which fish intake affects childhood growth and obesity remains unclear.

**OBJECTIVE:** To examine whether fish intake in pregnancy is associated with offspring growth and the risk of childhood overweight and obesity.

**DESIGN, SETTING, AND PARTICIPANTS:** Multicenter, population-based birth cohort study of singleton deliveries from 1996 to 2011 in Belgium, France, Greece, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Spain, and Massachusetts. A total of 26 184 pregnant women and their children were followed up at 2-year intervals until the age of 6 years.

**EXPOSURES:** Consumption of fish during pregnancy.

**MAIN OUTCOMES AND MEASURES:** We estimated offspring body mass index percentile trajectories from 3 months after birth to 6 years of age. We defined rapid infant growth as a weight gain z score greater than 0.67 from birth to 2 years and childhood overweight/obesity at 4 and 6 years as body mass index in the 85th percentile or higher for age and sex. We calculated cohort-specific effect estimates and combined them by random-effects meta-analysis.

**RESULTS:**

This multicenter, population-based birth cohort study included the 26 184 pregnant women and their children. The median fish intake during pregnancy ranged from 0.5 times/week in Belgium to 4.45 times/week in Spain. Women who ate fish more than 3 times/week during pregnancy gave birth to offspring with higher body mass index values from infancy through middle childhood compared with women with lower fish intake (3 times/week or less). High fish intake during pregnancy (>3 times/week) was associated with increased risk of rapid infant growth, with an adjusted odds ratio (aOR) of 1.22 (95% CI, 1.05-1.42) and increased risk of offspring overweight/obesity at 4 years (aOR, 1.14 [95% CI, 0.99-1.32]) and 6 years (aOR, 1.22 [95% CI, 1.01-1.47]) compared with an intake of once per week or less. Interaction analysis showed that the effect of high fish intake during pregnancy on rapid infant growth was greater among girls (aOR, 1.31 [95% CI, 1.08-1.59]) than among boys (aOR, 1.11 [95% CI, 0.92-1.34]; P = .02 for interaction).

**CONCLUSIONS AND RELEVANCE:**

High maternal fish intake during pregnancy was associated with increased risk of rapid growth in infancy and childhood obesity. Our findings are in line with the fish intake limit proposed by the US Food and Drug Administration and Environmental Protection Agency.

PMID: 26882542

## Ultrasound

J Clin Ultrasound. 2016 Feb 9. doi: 10.1002/jcu.22329.

**Diagnostic value of sonography for detecting endometrial pathologies in postmenopausal women with and without bleeding.**

Seckin B<sup>1</sup>, Cicek MN<sup>1</sup>, Dikmen AU<sup>2</sup>, Bostancı EI<sup>1</sup>, Muftuoglu KH<sup>3</sup>.

Abstract

**PURPOSE:**

To investigate the diagnostic value of endometrial thickness measurement on sonography in predicting endometrial pathologies in postmenopausal women with vaginal bleeding and in those with asymptomatic thickened endometrium.

**METHODS:**

Six hundred two postmenopausal women with vaginal bleeding or asymptomatic thickened endometrium were evaluated in this study. Two hundred seventy-four women with postmenopausal bleeding regardless of endometrial thickness (group 1: symptomatic) and 328 women with an incidental finding of thickened endometrium ( $\geq 5$  mm) without bleeding (group 2: asymptomatic) underwent endometrial biopsy for histopathologic examination. The receiver operating characteristics curves of endometrial thickness measurement for prediction of endometrial pathologies were analyzed.

**RESULTS:**

Endometrial carcinoma was detected in eight women (2.9%) in group 1 and in three (0.9%) in group 2. The best cutoff point for endometrial thickness in predicting endometrial carcinoma in group 1 was 8.2 mm, which provided 75% sensitivity (95% confidence interval [CI], 40.9-92.9%) and 74% specificity (95% CI, 68-78.5%); area under the receiver operating characteristics curve (AUC), 0.88; 95% CI, 0.76-1.00%;  $p = 0.0001$ . In group 2, the AUC was 0.76 (95% CI, 0.46-1.00;  $p = 0.114$ ); the evidence was inconclusive as to the relationship between endometrial thickness and malignancy. For the prediction of polyps, the AUCs of endometrial thickness were 0.77 for group 1 (95% CI, 0.71-0.83%;  $p = 0.0001$ ) and 0.61 for group 2 (95% CI, 0.54-0.67%;  $p = 0.002$ ).

**CONCLUSIONS:**

Sonographically determined endometrial thickness measurement shows high diagnostic performance for detection of endometrial cancer in symptomatic postmenopausal women at the optimal cutoff thickness of approximately 8 mm, although the evidence supporting the use of sonography for predicting malignancy in asymptomatic women is inconclusive. For polyp detection, this technique shows moderate diagnostic ability in symptomatic women, but its predictive value is low in asymptomatic women. © 2016 Wiley Periodicals, Inc. J Clin Ultrasound, 2016.

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**KEYWORDS:**

endometrial biopsy; endometrium; postmenopause; ultrasonography; uterus

PMID: 26857098

### Alcohol

#### Alcohol and pregnancy

CDC, 02/12/2016

An estimated 3.3 million US women between the ages of 15 and 44 years are at risk for exposing their developing baby to alcohol because they are drinking, sexually active, and not using birth control to prevent pregnancy, according to a new CDC Vital Signs report. The report also found that 3 in 4 women who want to get pregnant as soon as possible do not stop drinking alcohol. Alcohol use during pregnancy, even within the first few weeks and before a woman knows she is pregnant, can cause lasting physical, behavioral, and intellectual disabilities that can last for a child's lifetime. These disabilities are known as fetal alcohol spectrum disorders (FASDs). There is no known safe amount of alcohol – even beer or wine – that is safe for a woman to drink at any stage of pregnancy. About half of all pregnancies in the US are unplanned and, even if planned, most women will not know they are pregnant until they are 4–6 weeks into the pregnancy when they still might be drinking.

It is critical for healthcare providers to assess a woman's drinking habits during routine medical visits; advise her not to drink at all if she is pregnant, trying to get pregnant, sexually active, and not using birth control; and recommend services if she needs help to stop drinking.

**8. VISCERA****Food and IBS**

Am J Gastroenterol. 2016 Feb 9. doi: 10.1038/ajg.2016.12.

**Food: The Main Course to Wellness and Illness in Patients With Irritable Bowel Syndrome.**  
Chey WD<sup>1</sup>.

**Abstract**

Food sits at the intersection between gastrointestinal (GI) physiology and symptoms in patients with the irritable bowel syndrome (IBS). It is now clear that the majority of IBS sufferers associate eating a meal with their GI and non-GI symptoms. This is hardly surprising when one considers that food can affect a variety of physiologic factors (motility, visceral sensation, brain-gut interactions, microbiome, permeability, immune activation, and neuro-endocrine function) relevant to the pathogenesis of IBS. In recent years, clinical research has increasingly focused on diet as a treatment for IBS. There is a relative paucity of data from rigorous, randomized, controlled trials for any dietary intervention in IBS patients.

Currently, the largest body of literature has addressed the efficacy of dietary restriction of fermentable oligo, di, monosaccharides, and polyols (FODMAPs). In the future, dietary treatments for IBS will move beyond the current focus on elimination to embrace supplementation with "functional" foods.

Am J Gastroenterol advance online publication, 9 February 2016; doi:10.1038/ajg.2016.12.

PMID: 26856749

**IBS and diet**

World J Gastroenterol. 2016 Jan 21;22(3):895-905. doi: 10.3748/wjg.v22.i3.895.

**Diet and nutritional factors in inflammatory bowel diseases.**

Owczarek D<sup>1</sup>, Rodacki T<sup>1</sup>, Domagała-Rodacka R<sup>1</sup>, Cibor D<sup>1</sup>, Mach T<sup>1</sup>.

**Abstract**

Inflammatory bowel disease (IBD) development is affected by complex interactions between environmental factors, changes in intestinal flora, various predisposing genetic properties and changes in the immune system. Dietary factors seem to play an underestimated role in the etiopathogenesis and course of the disease. However, research about food and IBD is conflicting. An excessive consumption of sugar, animal fat and linoleic acid is considered a risk factor for IBD development, whereas a high fiber diet and citrus fruit consumption may play a protective role. Also, appropriate nutrition in particular periods of the disease may facilitate achieving or prolonging remissions and most of all, improve the quality of life for patients. During disease exacerbation, a low fiber diet is recommended for most patients. In the remission time, an excessive consumption of alcohol and sulfur products may have a negative effect on the disease course. Attempts are also made at employing diets composed in detail in order to supplement IBD therapy. A diet with a modified carbohydrate composition, a semi-vegetarian diet and a diet low in fermentable oligosaccharides, disaccharides, monosaccharides and polyols are under investigation.

Due to chronic inflammation as well as side effects of chronically used medications, patients with IBD are also at increased risk of nutritional factor deficiencies, including iron, calcium, vitamin D, vitamin B12, folic acid, zinc, magnesium and vitamin A. It should also be remembered that there is no single common diet suitable for all IBD patients; each of them is unique and dietary recommendations must be individually developed for each patient, depending on the course of the disease, past surgical procedures and type of pharmacotherapy.

**KEYWORDS:**

Crohn's disease; Diet; Nutrition; Supplementation; Ulcerative colitis

PMID: 26811635

**Gluten and Celiac's**

J Clin Gastroenterol. 2016 Mar;50(3):239-43. doi: 10.1097/MCG.0000000000000392.

**Frequency and Cause of Persistent Symptoms in Celiac Disease Patients on a Long-term Gluten-free Diet.**

Stasi E<sup>1</sup>, Marafini I, Caruso R, Soderino F, Angelucci E, Del Vecchio Blanco G, Paoluzi OA, Calabrese E, Sedda S, Zorzi F, Pallone F, Monteleone G.

Abstract

**GOALS:**

To estimate the frequency and cause of nonresponsive celiac disease (CD).

**BACKGROUND:**

Treatment of CD is based on life-long adherence to a gluten-free diet (GFD). Some celiac patients experience persistence of symptoms despite a GFD. This condition is defined as nonresponsive CD.

**STUDY:**

Celiac patients on a GFD for at least 12 months underwent diet compliance assessment, laboratory tests, breath tests, endoscopic, and histologic evaluations according to the symptoms/signs reported.

**RESULTS:**

Seventy of 321 (21.8%) patients had persistent or recurrent symptoms/signs. The cause of symptom persistence was evaluated in 56 of 70 patients. Thirteen of 56 (23%) patients were antiendomysial antibody positive. Among the patients with negative serology, 1 had fibromyalgia, and 3 had evidence that disproved the diagnosis of CD. The remaining 39 patients with negative serology underwent duodenal biopsy sampling, which evidenced histologic alterations in 24 patients. Among the 15 patients with normal histology 3 were lactose intolerant, 9 had irritable bowel syndrome, 2 had gastroesophageal reflux disease, and in 1 patient a cause for the persistent symptom was not identified. In patients with confirmed diagnosis of CD, exposure to dietary gluten was the main cause of persistence of symptoms/signs, and consistently after dietary modification, symptoms resolved in 63% of the patients at later time points during follow-up.

**CONCLUSION:**

Nonresponsive CD occurs in nearly one fifth of celiac patients on GFD and its occurrence suggests further investigations to optimize the management of celiac patients.

PMID: 26280705

**10 A. CERVICAL SPINE****C spine pain and respiration****Respiratory dysfunction in patients with chronic neck pain: what is the current evidence?**

Dr Zacharias Dimitriadis, MSc, PhD Eleni Kapreli, MSc, PhD Nikolaos Strimpakos, MSc, PhD Jacqueline Oldham, PhD

DOI: <http://dx.doi.org/10.1016/j.jbmt.2016.02.001>

**Summary**

Respiratory function of patients with neck pain has not been given much consideration in usual clinical practice. The problem has however been highlighted occasionally by renowned clinical scientists and recently there is a growing interest in the investigation of respiratory function in this clinical population. The aim of this review is to critically present the emerging evidence and discuss the similarities and differences observed. Although the evidence for some respiratory parameters is conflicting, it seems to be generally agreed that others such as maximal voluntary ventilation, strength of respiratory muscles, chest mechanics and partial pressure of arterial carbon dioxide are affected in patients with chronic neck pain. The effect size of the respiratory dysfunction regarding these respiratory parameters can be approximately described as moderate. These findings not only suggest a more thoughtful drug prescription, but they may lead to consideration of incorporation of respiratory assessment and treatment into routine physiotherapy practice. Indeed preliminary studies exploring the incorporation of treatment into usual practice have provided very promising results not only in relation to respiratory function, but also for other parameters of clinical interest. There remains however an imminent need for randomized controlled trials to confirm the evidence base for such an approach.

**Keywords:**

Neck pain, respiratory strength, spirometry, blood gases, ventilation

**Hyperalgesia**

Pain Physician. 2016 Feb;19(2):77-88.

**Widespread Pressure Pain Hyperalgesia in Chronic Nonspecific Neck Pain with Neuropathic Features: A Descriptive Cross-Sectional Study.**

Lopez-de-Uralde-Villanueva I<sup>1</sup>, Beltran-Alacreu H<sup>2</sup>, Fernandez-Carnero J, Kindelan-Calvo P<sup>3</sup>, La Touche R.

**BACKGROUND:** Neck pain has an elevated prevalence worldwide. Most people with neck pain are diagnosed as nonspecific neck pain patients. Poor recovery in neck disorders, as well as high levels of pain and disability, are associated with widespread sensory hypersensitivity.

Nevertheless, there is controversy regarding the presence of widespread hyperalgesia in chronic nonspecific neck pain (CNSNP); this lack of agreement could be due to the presence of different pathophysiological mechanisms in CNSNP.

**OBJECTIVES:** To determinate differences in pressure pain thresholds (PPTs) over extracervical and cervical regions, and differences in cervical range of motion (ROM) between patients with CNSNP with and without neuropathic features (NF and No-NF, respectively). In addition, this study expected to observe correlations in these 2 types of CNSNP of psychosocial factors with PPTs and with cervical ROM separately.

**STUDY DESIGN:** Descriptive, cross-sectional study.

**SETTING:** A hospital physiotherapy outpatient department.

**METHODS:** This research involved 53 patients with CNSNP that had obtained a Self-completed Leeds Assessment of Neuropathic Symptoms and Signs pain scale (S-LANSS) score = 12 (pain with NF, NF group); 54 that had obtained a S-LANSS score < 12 (pain with No-NF, No-NF group), and 53 healthy controls (control group, CG). Measures included: PPTs (suboccipital muscle, upper fibers trapezius muscle, lateral epicondyle, and anterior tibial muscle), cervical ROM (flexion, extension, rotation, and latero-flexion), pain intensity (Visual Analog Scale [VAS]), neck disability index (NDI), kinesiophobia (Tampa Scale of Kinesiophobia-11 [TSK-11]), and Pain Catastrophizing Scale (PCS).

**RESULTS:** A statistically significant effect was observed for the group factor in all assessed measures ( $P < 0.01$ ). Both CNSNP groups showed statistically significant differences compared to the CG for PPTs in the cervical region (suboccipital and upper fibers trapezius muscles), but only the NF group demonstrated statistically significant differences for PPTs in the lateral epicondyle and anterior tibial muscle when compared to the CG or No-NF group. The largest statistically significant correlation found in the NF group was between PPT in the anterior tibial muscle and TSK-11 ( $r = -0.372$ ;  $P < 0.01$ ), while in the No-NF group it was between PPT in the suboccipital muscle and NDI ( $r = -0.288$ ;  $P < 0.05$ ). Statistically significant differences were found between the 2 CNSNP groups and CG in all cervical ROMs, but not between both CNSNP groups. The largest statistically significant correlation observed in the NF group was between cervical total rotation and TSK-11 ( $r = -0.473$ ;  $P < 0.01$ ), while in the No-NF group it was between cervical total latero-flexion and PCS ( $r = -0.532$ ;  $P < 0.01$ ).

**LIMITATIONS:** Although the S-LANSS scale has been validated as a screening tool for pain with NF, currently there is no "gold standard," so these findings should be interpreted with caution.

**CONCLUSIONS:** Widespread pressure pain hyperalgesia was detected in patients with CNSNP with NF, but not in patients with CNSNP with No-NF. Patients with CNSNP presented bilateral pressure pain hyperalgesia over the cervical region and a decreased cervical ROM compared to healthy controls. However, no differences were found between the 2 CNSNP groups. These findings suggest differences in the mechanism of pain processing between patients with CNSNP with NF and No-NF.

PMID: 26815252

**12 A. WHIPLASH****Exercise impact**

Eur J Pain. 2016 Feb;20(2):307-15. doi: 10.1002/ejp.729. Epub 2015 May 29.

**Factors associated with pain and disability reduction following exercise interventions in chronic whiplash.**

Ludvigsson ML<sup>1,2</sup>, Peterson G<sup>1,3</sup>, Dederig Å<sup>4,5</sup>, Falla D<sup>6,7</sup>, Peolsson A<sup>1</sup>.

Abstract

**BACKGROUND:**

Some studies support the prescription of exercise for people with whiplash-associated disorders (WAD); however, the response is highly variable. Further research is necessary to identify factors which predict response.

**METHODS:**

This is a secondary analysis of a randomized, multicentre controlled clinical trial of 202 volunteers with chronic WAD (grades 2 and 3). They received either neck-specific exercise with, or without a behavioural approach, or prescription of physical activity for 12 weeks. Treatment response, defined as a clinical important reduction in pain or disability, was registered after 3 and 12 months, and factors associated with treatment response were explored using logistic regression.

**RESULTS:**

Participation in the neck-specific exercise group was the only significant factor associated with both neck pain and neck disability reduction both at 3 and 12 months. Patients in this group had up to 5.3 times higher odds of disability reduction and 3.9 times higher odds of pain reduction compared to those in the physical activity group. Different baseline features were identified as predictors of response depending on the time point examined and the outcome measure selected (pain vs. disability).

**CONCLUSION:**

Factors associated with treatment response after exercise interventions differ in the short and long term and differ depending on whether neck pain or disability is considered as the primary outcome. Participation in a neck-specific exercise intervention, in contrast to general physical activity, was the only factor that consistently indicated higher odds of treatment success. These results support the prescription of neck-specific exercise for individuals with chronic WAD.

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PMID: 26031995

## 12 B. CERVICAL SURGERIES

### Impact of fusion

Clin Orthop Relat Res. 2016 Feb 1.

#### **Reoperation After Cervical Disc Arthroplasty Versus Anterior Cervical Discectomy and Fusion: A Meta-analysis.**

Zhong ZM<sup>1</sup>, Zhu SY<sup>2</sup>, Zhuang JS<sup>2</sup>, Wu Q<sup>2</sup>, Chen JT<sup>2</sup>.

Abstract

#### **BACKGROUND:**

Anterior cervical discectomy and fusion is a standard surgical treatment for cervical radiculopathy and myelopathy, but reoperations sometimes are performed to treat complications of fusion such as pseudarthrosis and adjacent-segment degeneration. A cervical disc arthroplasty is designed to preserve motion and avoid the shortcomings of fusion. Available evidence suggests that a cervical disc arthroplasty can provide pain relief and functional improvements similar or superior to an anterior cervical discectomy and fusion. However, there is controversy regarding whether a cervical disc arthroplasty can reduce the frequency of reoperations.

#### **QUESTIONS/PURPOSES:**

We performed a meta-analysis of randomized controlled trials (RCTs) to compare cervical disc arthroplasty with anterior cervical discectomy and fusion regarding (1) the overall frequency of reoperation at the index and adjacent levels; (2) the frequency of reoperation at the index level; and (3) the frequency of reoperation at the adjacent levels.

#### **METHODS:**

PubMed, EMBASE, and the Cochrane Register of Controlled Trials databases were searched to identify RCTs comparing cervical disc arthroplasty with anterior cervical discectomy and fusion and reporting the frequency of reoperation. We also manually searched the reference lists of articles and reviews for possible relevant studies. Twelve RCTs with a total of 3234 randomized patients were included. Eight types of disc prostheses were used in the included studies. In the anterior cervical discectomy and fusion group, autograft was used in one study and allograft in 11 studies. Nine of 12 studies were industry sponsored. Pooled risk ratio (RR) and associated 95% CI were calculated for the frequency of reoperation using random-effects or fixed-effects models depending on the heterogeneity of the included studies. A funnel plot suggested the possible presence of publication bias in the available pool of studies; that is, the shape of the plot suggests that smaller negative or no-difference studies may have been performed but have not been published, and so were not identified and included in this meta-analysis.

#### **RESULTS:**

The overall frequency of reoperation at the index and adjacent levels was lower in the cervical disc arthroplasty group (6%; 108/1762) than in the anterior cervical discectomy and fusion group (12%; 171/1472) (RR, 0.54; 95% CI, 0.36-0.80;  $p = 0.002$ ). Subgroup analyses were performed according to secondary surgical level. Compared with anterior cervical discectomy and fusion, cervical disc arthroplasty was associated with fewer reoperations at the index level (RR, 0.50; 95% CI, 0.37-0.68;  $p < 0.001$ ) and adjacent levels (RR, 0.52; 95% CI, 0.37-0.74;  $p < 0.001$ ).

#### **CONCLUSIONS:**

Cervical disc arthroplasty is associated with fewer reoperations than anterior cervical discectomy and fusion, indicating that it is a safe and effective alternative to fusion for cervical radiculopathy and myelopathy. However, because of some limitations, these findings should be interpreted with caution. Additional studies are needed. LEVEL OF EVIDENCE: Level I, therapeutic study.

## Fusions and adjacent segment

**The Fate of Adjacent Segments after Anterior Cervical Discectomy and Fusion: The Influence of an Anterior Plate System**

Sang-Soak Ahn, MD Ho-Kyu Paik, MD Dong-Kyu Chin, MD, PhD Sang-Hyeon Kim, MD ,  
Dong-Won Kim, MD, PhD Min-Geun Ku, MD

DOI: <http://dx.doi.org/10.1016/j.wneu.2016.01.013>

**Highlights**

- 1. Only a few studies have compared the incidence of adjacent segment degeneration (ASD) between anterior cervical discectomy and fusion with cage alone (ACDF-CA) and ACDF with cage and plate (ACDF-CP). We investigated the impact of an anterior plate on the development of ASD after ACDF for single-level cervical disease using CT and MRI.
- 2. The patients were divided into two groups according to the operation method: ACDF-CA (33 patients) and ACDF-CP (35 patients) with a retrospective matched cohort design.
- 3. The anterior plate system in ACDF tends to increase adjacent segmental motion and decrease adjacent segmental disc height.
- 4. Irrespective of clinical symptoms, ACDF-CP has a higher tendency to result in ASD than ACDF-CA after 24 months post-surgery.

**Abstract****Objective**

The purpose of this study was to compare anterior cervical discectomy and fusion with cage alone (ACDF-CA) and ACDF with cage and plate (ACDF-CP) with regard to ASD diagnosed using CT and MRI with retrospective matched cohort design.

**Methods**

This study enrolled 68 patients who underwent single-level ACDF who were diagnosed with cervical degenerative disc disease and were followed up for at least two years with plain radiography, CT and MRI. The patients were divided into two groups according to the operation method: ACDF-CA (33 patients) and ACDF-CP (35 patients).

**Results**

ASD occurred in 4 of 33 patients who underwent ACDF-CA and 9 of 35 patients who underwent ACDF-CP as determined by CT and MRI. The upper segment range of motion (USROM) and lower segment range of motion (LSROM) increased in both groups postoperatively. The increase was greater in the ACDF-CP group without statistical significance. The upper segment disc height (UDH) and lower segment disc height (LDH) gradually decreased in both groups over time. The decrease was significantly greater in the ACDF-CP group at each follow-up visit. Pseudarthrosis and cage subsidence was observed more in the ACDF-CA group. The pain intensity for the neck in the ACDF-CA group was increased 12 and 24 months postoperatively.

**Conclusions**

The anterior plate system in ACDF tends to increase adjacent segmental motion and decrease adjacent segmental disc height. In addition, irrespective of clinical symptoms, ACDF-CP has a higher tendency to result in ASD than ACDF-CA after 24 months post-surgery.

### 13. CRANIUM/TMJ

#### Sleep apnea

#### **Sleep apnea takes a toll on brain function**

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UCLA Health System, 02/15/2016

**O**ne in 15 adults has moderate to severe obstructive sleep apnea, a disorder in which a person's breathing is frequently interrupted during sleep – as many as 30 times per hour. People with sleep apnea also often report problems with thinking such as poor concentration, difficulty with memory and decision-making, depression, and stress. According to new research from the UCLA School of Nursing, published online in the Journal of Sleep Research, people with sleep apnea show significant changes in the levels of two important brain chemicals, which could be a reason that many have symptoms that impact their day-to-day lives. UCLA researchers looked at levels of these neurotransmitters – glutamate and gamma-aminobutyric acid, known as GABA – in a brain region called the insula, which integrates signals from higher brain regions to regulate emotion, thinking and physical functions such as blood pressure and perspiration.

They found that people with sleep apnea had decreased levels of GABA and unusually high levels of glutamate.

## Sleep apnea

**Craniofacial and upper airway morphology in adult obstructive sleep apnea patients: a systematic review and meta-analysis of cephalometric studies**

Bala Chakravarthy Neelapu, M.Tech (Research Scholar) Dr. Om Prakash Kharbanda, BDS, MDS (Lucknow), MOrth RCS (Edinburgh), MMed (Dundee), FDS RCS (Edinburgh) Hon (Fellow Indian Board of Orthodontics Honoris Causa, CHIEF, Professor and Head)

Harish Kumar Sardana, PhD, M.E (Chief Scientist and Professor) Rajiv Balachandran, MDS (Senior Resident) Viren Sardana, M.Tech, MBBS (Scientist and Assistant Professor) Priyanka Kapoor, MDS (Associate Professor) Abhishek Gupta, M.E Research Scholar) Srikanth Vasamsetti, M.Tech (Scientist and Assistant Professor)

DOI: <http://dx.doi.org/10.1016/j.smr.2016.01.007>

**Summary**

Obstructive sleep apnea (OSA) is one of the common sleep disordered breathings in adults, characterised by frequent episodes of upper airway collapse during sleep. Craniofacial disharmony is an important risk factor for OSA. Overnight polysomnography (PSG) study is considered to be the most reliable confirmatory investigation for OSA diagnosis, whereas the precise localization of site of obstruction to the airflow cannot be detected. Identifying the cause of OSA in a particular ethnic population/individual subject helps to understand the etiological factors and effective management of OSA. The objective of the systematic review is to elucidate altered craniofacial anatomy on lateral cephalograms in adult subjects with established OSA. Significant weighted mean difference with insignificant heterogeneity were found for the following parameters: anterior lower facial height (ALFH: 2.48 mm), position of hyoid bone (Go-H: 5.45 mm, S-H: 6.89 mm, GoGn-H: 11.84°, GoGn-H: 7.22 mm, N-S-H: 2.14°), and pharyngeal airway space (PNS-Phw: -1.55 mm, pharyngeal space: -495.74 mm<sup>2</sup> and oro-pharyngeal area: -151.15 mm<sup>2</sup>). Significant weighted mean difference with significant heterogeneity were found for the following parameters: cranial base (SN: -2.25 mm, S-N-Ba: -1.45°), position and length of mandible (SNB: -1.49° and Go-Me: -5.66 mm) respectively, maxillary length (ANS-PNS: -1.76 mm), tongue area (T: 366.51 mm<sup>2</sup>), soft palate area (UV: 125.02 mm<sup>2</sup>), and upper airway length (UAL: 5.39 mm). This meta-analysis supports the relationship between craniofacial disharmony and obstructive sleep apnea. There is a strong evidence for reduced pharyngeal airway space, inferiorly placed hyoid bone and increased anterior facial heights in adult OSA patients compared to control subjects. The cephalometric analysis provides insight into anatomical basis of the etiology of OSA that can influence making a choice of appropriate therapy.

*Keywords:*

Obstructive sleep apnea (OSA), systematic review, meta-analysis, craniofacial morphology, Polysomnography

## Adolescents

Br J Oral Maxillofac Surg. 2016 Feb 2. pii: S0266-4356(16)00014-0. doi: 10.1016/j.bjoms.2016.01.012. [Epub ahead of print]

**Coronoid process and residual ankylotic mass as an autograft in the management of ankylosis of the temporomandibular joint in young adolescent patients: a retrospective clinical investigation.**

Bansal V<sup>1</sup>, Mowar A<sup>2</sup>, Dubey P<sup>2</sup>, Bhatnagar A<sup>3</sup>, Bansal A<sup>2</sup>.

Author information

Abstract

The aim of this non-randomised investigation was to assess the feasibility of using autogenous grafts (such as coronoid process and the resected ankylotic mass) in reconstruction of the condyle after gap arthroplasty for ankylosis of the temporomandibular joint (TMJ). Sixteen patients (23 joints) operated on between 2007 and 2009 were studied and postoperative measurements of maximum interincisal opening, bite force, range of movement, and infection were recorded. After a mean (SD) follow up of 55 (2.25) months mouth opening improved from 3 (3.84) mm to 33 (1.66) mm in patients treated with coronoid graft, while in patients treated with an ankylotic mass after a mean (SD) follow up of 58 (1.58) months it increased from 4 (2.64) mm to 26 (8.04) mm. Bite force six months postoperatively ranged from 18.25kg/cm<sup>2</sup> - 27.5kg/cm<sup>2</sup> after reconstruction with the coronoid process and 18.5kg/cm<sup>2</sup> - 23.25kg/cm<sup>2</sup> after reconstruction with the ankylotic mass. One patient developed reankylosis postoperatively and another developed infection, in both of which the ankylotic mass had been used. Both were managed successfully. Both the ankylotic mass and the coronoid process gave satisfactory results and seem to be options for reconstruction. However, the coronoid process graft was better than residual ankylotic mass in terms of masticatory efficiency, bite force, and range of movement.

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**KEYWORDS:**

Ankylotic bone; Bite force gauge; Coronoid process mandible; Costochondral graft; Sternoclavicular graft; Temporomandibular ankylosis; Temporomandibular reconstruction

PMID: 26851147

## Adolescents

**Will Unilateral Temporomandibular Joint Anterior Disc Displacement in Teenagers Lead to Asymmetry of Condyle and Mandible? A Longitudinal Study**

Qianyang Xie, DDS, MS (Resident) Professor Dr Chi Yang, DDS, MD Professor Dongmei He, DDS, MD Professor Xieyi Cai, DDS, MD Zhigui Ma, DDS, MS (Attending physician) Yuqing Shen, DDS, MS (Resident) Ahmed Abdelrehem, DDS,

DOI: <http://dx.doi.org/10.1016/j.jcms.2016.01.019>

**Abstract****Purpose**

To evaluate the change of morphological symmetry of the temporomandibular joints (TMJ) during natural course of unilateral juvenile anterior disc displacement (UJADD) by comparing the ipsilateral joint with the contralateral side; and to analyse its effect over mandibular asymmetry (MA).

**Patients and methods**

This study is a self-control longitudinal study. Consecutive UJADD cases with no history of TMJ infection, injuries to the jaws, or congenital, developmental and systematic disorders that may affect the craniofacial growth were collected and followed for at least 6 months. Patients' age at both first visit and revisit was recorded. Pictures of Magnetic Resonance Imaging (MRI) were selected to measure the differences between bilateral condylar height, disc length and condyle-disc distance, and comparison of the measurements before and after follow-up were made. Meanwhile, posteroanterior cephalometric radiographs (PA) were taken and deviation of menton from facial midline was measured before and after follow-up. Severity of MA were divided into 4 stages according to menton deviation: Non-MA (<2mm), Minor-MA ( $\geq$ 2mm, <4mm), Medium-MA ( $\geq$ 4mm, <6mm), and Major-MA ( $\geq$ 6mm). The constituent ratio of MA was evaluated and correlation between TMJ morphological change and asymmetry of the mandible was analysed.

**Results**

Forty four patients were included, with a mean follow-up of 12.22 months. The average age was 16.31 years old (range, 10 to 20 years) at first visit. Significant progression of disc displacement was found: condyle-disc distance increased, disc shortened and difference between bilateral condylar heights increased. Along with this, occurrence of MA increased from 86.36% to 93.18%, and average menton deviation increased from 5.58mm to 7.74 mm after follow-up. The correlation coefficient (CC) of increase of condylar height difference and development of MA was 0.681 ( $p<0.05$ ). Also, increase of menton deviation was significantly related to age of the patients ( $CC=-0.760$ ,  $p<0.05$ ).

**Conclusion**

The results show that UJADD result in asymmetric growth bilateral TMJs, especially condylar height, which was much shorter on the ipsilateral side. In the same time, MA got worse during the natural course of UJADD. It is concluded that UJADD was one of the major causative factors of MA.

**Keywords:**

Juvenile unilateral anterior disc displacement, natural course, mandibular asymmetry

**Prolotherapy**

Int J Oral Maxillofac Surg. 2016 Feb 1. pii: S0901-5027(16)00027-8. doi: 10.1016/j.ijom.2016.01.006. [Epub ahead of print]

**Is dextrose prolotherapy superior to placebo for the treatment of temporomandibular joint hypermobility? A randomized clinical trial.**

Cömert Kiliç S<sup>1</sup>, Güngörmüş M<sup>2</sup>.

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- <sup>2</sup>Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Gaziantep University, Gaziantep, Turkey.

**Abstract**

A randomized clinical trial involving adult patients with bilateral temporomandibular joint (TMJ) hypermobility referred for treatment was implemented. The sample comprised 30 consecutive patients, who were divided randomly into two groups. The TMJ hypermobility was treated with either saline (placebo group) or dextrose injections (study group). The solution was injected into five different TMJ areas in three sessions at monthly intervals. The predictor variable was the treatment technique. The outcome variables were visual analogue scale (VAS) evaluations and maximum inter-incisal opening (MIO). Outcome variables were recorded preoperatively and at 12 months postoperatively. Descriptive and bivariate statistics were computed, and significance was set at a P-value of <0.05. The follow-up sample comprised 26 subjects: 12 in the placebo group and 14 in the study group. Masticatory efficiency increased and general pain complaints and joint sounds decreased significantly in both groups. MIO decreased significantly only in the study group. Insignificant changes in the other parameters were found for both groups. After estimating differences between follow-up and baseline outcomes, the mean change in primary outcome variables showed no statistically significant difference between the two groups. These findings suggest that dextrose prolotherapy is no more effective than placebo treatment for any of the outcome variables of TMJ hypermobility assessed.

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**KEYWORDS:**

TMJ hypermobility; clinical symptoms; dextrose prolotherapy; saline injection

PMID: 26846795

**Smile**

Orthod Craniofac Res. 2016 Feb 9. doi: 10.1111/ocr.12118.

**The impact of occlusal plane cant along with gingival display on smile attractiveness.**

Kaya B<sup>1</sup>, Uyar R<sup>2</sup>.

Abstract

**OBJECTIVES:**

To evaluate the influence of occlusal plane cant in conjunction with maxillary gingival display on perception of smile attractiveness by orthodontists, dentists, and laypersons.

**SETTING AND SAMPLE POPULATION:**

Faculty of Dentistry at Baskent University. A total of 204 raters for smile attractiveness.

**MATERIALS AND METHODS:**

A frontal intra-oral photograph of aligned teeth was modified using image processing software. Six different occlusal lines representing 0° to 5° cants were obtained by tilting the photographs. Each occlusal cant was adjusted in five manners resulting in five different gingival display amounts. Attractiveness of the 30 different smiles was evaluated by 204 raters divided into three groups (n = 68 in each group).

**RESULTS:**

Both occlusal cant ( $p < 0.001$ ) and gingival display amount ( $p < 0.001$ ) had a statistically significant influence on smile attractiveness. Smile attractiveness scores with reference to amount of gingival display showed a significant difference between rater groups ( $p < 0.001$ ). Orthodontists preferred 1-mm coverage of upper central incisors by the upper lip, whereas dentists and laypersons preferred 2 mm. Significant ( $p < 0.001$ ) interaction was observed between occlusal cant and gingival display amount, which influenced smile attractiveness.

**CONCLUSION:**

Increase in both occlusal plane cant and gingival display negatively influences smile attractiveness. The influence of occlusal plane cant becomes less when gingival display increases, whereas the influence of gingival display decreases when occlusal cant increases. Dentists are more generous than orthodontists, while laypersons are the most generous regarding smile attractiveness scores.

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**KEYWORDS:**

dental; esthetics; self-concept; smiling

PMID: 26856663

**Pacifiers**

Int J Paediatr Dent. 2016 Feb 9. doi: 10.1111/ipd.12227.

**Effects of conventional and orthodontic pacifiers on the dental occlusion of children aged 24-36 months old.**

Lima AA<sup>1</sup>, Alves CM<sup>2,3</sup>, Ribeiro CC<sup>3,4</sup>, Pereira AL<sup>5,6</sup>, da Silva AA<sup>3,7</sup>, Silva LF<sup>8,9,10</sup>, Thomaz EB<sup>3,11</sup>.

Abstract

**AIM:**

To investigate the effects of conventional and orthodontic pacifiers on the prevalence of malocclusion (MO) considering frequency, duration, and intensity of the sucking habit.

**DESIGN:**

Data were collected at three time-points: birth, T1; (12-24 months old), T2; (24-36 months old), T3 and were divided into three groups: control (GC; 110), without non-nutritive sucking habits; orthodontic pacifiers (GOrth; 55); conventional pacifiers (GConv; 55). A questionnaire was applied. Clinical examination was performed at T3. The groups were compared as to the prevalence and severity of anterior open bite (AOB), accentuated overjet, anterior crossbite, posterior crossbite (PCB).

**RESULTS:**

The use of pacifiers was associated with occurrence of MO compared to GC ( $P < 0.05$ ). Frequency, intensity, and duration of pacifier use was also associated with of MO. There was significant difference in the prevalence of MO between GConv and GOrth for AOB ( $P = 0.027$ ). Only GConv exhibited higher odds of PCB compared to GC ( $P = 0.040$ ). The prevalence of MO was significantly higher in pacifiers users ( $P < 0.001$ ).

**CONCLUSION:**

The prevalence of MO was higher among children who used pacifiers. According to a general trend, the use of conventional pacifiers was associated to severe anterior open bite and overjet.

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PMID:26856705

### 14. HEADACHES

#### Light therapy

#### **Migraine: Light therapy may bring new hope**

Medical University of Vienna, 02/17/2016

Migraines often involve heightened sensitivity to light. In a project funded by the Austrian Science Fund FWF, a team of researchers from the Medical University Vienna is investigating new therapies to treat light sensitivity, which greatly disturbs those affected. “With the passage of time we have come to suspect that avoiding light may be detrimental, because it can heighten sensitivity to light – so-called photophobia – even more”, explains migraine specialist Christian Wober. This can be compared to people who are afraid of heights or of confined spaces. Avoiding such fear-provoking situations will not solve the problem. In a recently initiated study funded by the Austrian Science Fund FWF, a team of researchers from the Medical University Vienna is exploring whether there are other, more sustainable ways of dealing with light sensitivity during migraine attacks.

First investigations have shown that the opposite approach, namely desensitising the brain to light stimuli, might be a better strategy than avoiding light. In one-week training sessions patients are exposed to “flickering light” in order to accustom the brain to bright or normal light

**Prayer and HA's**

J Evid Based Complementary Altern Med. 2016 Feb 9. pii: 2156587215627551. [

**Effect of Prayer on Intensity of Migraine Headache: A Randomized Clinical Trial.**

Tajadini H<sup>1</sup>, Zangiabadi N<sup>2</sup>, Divsalar K<sup>3</sup>, Safizadeh H<sup>4</sup>, Esmaili Z<sup>5</sup>, Rafiei H<sup>6</sup>.

Abstract

**BACKGROUND AND AIM:**

Migraine is a common form of headache that affects patients quality of life negatively. In addition to pharmacologic treatment, there are a variety of nonpharmacologic treatments for migraine headache. In present study, we examined the effect of prayer on intensity of migraine pain.

**METHODS:**

In a prospective, randomized, controlled trial from October 2013 to June 2014, this study has been conducted in Kerman, Iran. We randomly assigned 92 patients in 2 groups to receive either 40 mg of propranolol twice a day for 2 month (group "A") or 40 mg of propranolol twice a day for 2 months with prayer (group "B"). At the beginning of study and 3 months after intervention, patients' pain was measured using the visual analogue scale.

**RESULTS:**

At the beginning of study and before intervention, the mean score of pain in patients in groups A and B were  $5.7 \pm 1.6$  and  $6.5 \pm 1.9$ , respectively. According to results of independent t test, mean score of pain intensity at the beginning of study were similar between patients in 2 groups ( $P > .05$ ). Three month after intervention, mean score of pain intensity decreased in patients in both groups. At this time, the mean scores of pain intensity were  $5.4 \pm 1.1$  and  $4.2 \pm 2.3$  in patients in groups A and B, respectively. This difference between groups was statistically significant ( $P < .001$ ).

**CONCLUSIONS:**

The present study revealed that prayer can be used as a nonpharmacologic pain coping strategy in addition to pharmacologic intervention for this group of patients.

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**KEYWORDS:**

alternative therapies; complementary therapies; migraine headache; pain intensity

PMID: 26865602

**15. VESTIBULAR****Hypofunction treatment**

Physiother Res Int. 2015 Jun 25. doi: 10.1002/pri.1635.

**The Effectiveness of Vestibular Rehabilitation Interventions in Treating Unilateral Peripheral Vestibular Disorders: A Systematic Review.**

Arnold SA<sup>1</sup>, Stewart AM<sup>1</sup>, Moor HM<sup>1</sup>, Karl RC<sup>1</sup>, Reneker JC<sup>1</sup>.

Abstract

**BACKGROUND AND PURPOSE:**

Various types of vestibular rehabilitation therapy are routinely used in clinical practice to treat unilateral peripheral vestibular hypofunction. The purpose of this systematic review was to compare the effectiveness of vestibular rehabilitation interventions (adaptation, substitution and habituation) in people with unilateral peripheral vestibular hypofunction, exclusionary of benign paroxysmal positional vertigo and Meniere's disease.

**METHODS:**

A search of the literature was conducted using PubMed, CINAHL and Scopus. Studies were eligible for inclusion if they were 1) a randomized controlled trial or randomized clinical trial; 2) written in English; 3) of participants with a unilateral, peripheral vestibular hypofunction; 4) of a conservative treatment approach only; and 5) with human subjects. Quality was assessed by two authors using the Physiotherapy Evidence Database scale. Effect size was calculated to determine the effect of treatment within each study group.

**RESULTS:**

Seven papers were selected for inclusion. Physiotherapy Evidence Database scores ranged from 2/10 to 7/10. Interventions within the selected studies included combinations of adaptation, habituation, substitution or substitution by itself. Calculated effect sizes, or significance values, revealed that all interventions demonstrated effectiveness. Two studies reported improvements on the dynamic gait index, and a large difference was seen between intervention groups of the two studies.

**DISCUSSION:**

Results suggest that vestibular therapy for unilateral peripheral vestibular hypofunction is effective. When considering all seven studies included in the review, it is difficult to determine the superiority of one intervention over another in treating unilateral peripheral vestibular hypofunction except when patient outcomes are captured by the dynamic gait index or dizziness handicap inventory. Many studies in this review demonstrate notable biases, suggesting that results should be used with caution. Future research should aim to use a common set of measures to capture outcomes. Copyright © 2015 John Wiley & Sons, Ltd.

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**KEYWORDS:**

dizziness/rehabilitation; exercise therapy; head movements; vestibular diseases/rehabilitation

PMID:26111348

**Exercise**

Am J Phys Med Rehabil. 2015 Sep 11

**Effects of Vestibular Rehabilitation on Balance Control in Older People with Chronic Dizziness: A Randomized Clinical Trial.**

Ricci NA<sup>1</sup>, Aratani MC, Caovilla HH, Ganança FF.

Abstract

**OBJECTIVE:**

The aim of this study was to compare the effects of vestibular rehabilitation protocols on balance control in elderly with dizziness.

**DESIGN:**

This is a randomized clinical trial with 3-mo follow-up period. The sample was composed of 82 older individuals with chronic dizziness from vestibular disorders. The control group was treated according to the Conventional Cawthorne & Cooksey protocol (n = 40), and the experimental group was submitted to a Multimodal Cawthorne & Cooksey protocol (n = 42). Measures included Dynamic Gait Index, fall history, hand grip strength, Time Up-and-Go Test, sit-to-stand test, multidirectional reach, and static balance tests.

**RESULTS:**

With the exception of history of falls, Forward Functional Reach, Unipedal Right and Left Leg Eyes Closed, and Sensorial Romberg Eyes Open, all outcomes improved after treatments. Such results persisted at follow-up period, with the exception of the Tandem Eyes Open and the Timed Up-and-Go manual. The between-group differences for Sensorial Romberg Eyes Closed (4.27 secs) and Unipedal Left Leg Eyes Open (4.08 secs) were significant after treatment, favoring the Multimodal protocol.

**CONCLUSIONS:**

Both protocols resulted in improvement on elderly's balance control, which was maintained during a short-term period. The multimodal protocol presented better performance on specific static balance tests.

PMID: 26368833

## Quality of life

Int Arch Otorhinolaryngol. 2015 Jul;19(3):238-47. doi: 10.1055/s-0035-1547523. Epub 2015 May 6.

**Effectiveness of a Vestibular Rehabilitation Protocol to Improve the Health-Related Quality of Life and Postural Balance in Patients with Vertigo.**

Tsukamoto HF<sup>1</sup>, Costa Vde S<sup>2</sup>, Silva RA Junior<sup>2</sup>, Pelosi GG<sup>3</sup>, Marchiori LL<sup>2</sup>, Vaz CR<sup>4</sup>, Fernandes KB<sup>5</sup>.

## Abstract

**Introduction** Dizziness can be characterized as a balance disorder that causes discomfort, leading to several functional limitations. Currently, vestibular rehabilitation has been highlighted as a possible treatment.

**Objective** Analyze the effects of completing a vestibular rehabilitation treatment protocol on quality of life and postural balance in patients with vestibular complaints, as well as to compare these effects between the patients taking or not taking antivertigo drugs.

**Methods** A nonrandomized controlled trial was performed with 20 patients previously diagnosed with vestibular diseases. Information regarding vertigo symptoms, quality of life as assessed through the Dizziness Handicap Inventory, visual analog scale of dizziness, and stabilometry using force platform was collected. Patients were treated for 12 weeks by a custom protocol. The sample was divided into two groups according to the use (medicated group, n = 9) or not (control group, n = 11) of antivertigo drugs.

**Results** There was improvement in quality of life ( $p < 0.001$ ) and intensity of dizziness ( $p = 0.003$ ) with the intervention. An improvement of postural balance was observed through functional tests. However, no statistically significant difference was noted in stabilometry. When both groups were compared, no statistically significant differences between the variations of the variables analyzed were found in the re-evaluation session.

**Conclusion** Quality of life and postural balance are improved with intervention. However, this improvement is not associated with pharmacologic treatment.

**KEYWORDS:** *dizziness; medicines; postural balance; quality of life; rehabilitation*

PMID: 26157499

**Bilateral hypofunction**

J Vestib Res. 2015;25(3-4):185-94. doi: 10.3233/VES-150556.

**Variables associated with outcome in patients with bilateral vestibular hypofunction: Preliminary study.**

Herdman SJ<sup>1</sup>, Hall CD<sup>2,3</sup>, Maloney B<sup>4,5</sup>, Knight S<sup>5,6</sup>, Ebert M<sup>5,7</sup>, Lowe J<sup>5,8</sup>.

Abstract

**BACKGROUND:**

Vestibular rehabilitation (VR) improves symptoms and function in some but not all patients with bilateral vestibular hypofunction (BVH).

**OBJECTIVE:**

The purpose of this retrospective study was to examine change following vestibular rehabilitation and to identify factors associated with rehabilitation outcome in patients with BVH.

**METHODS:**

Data from 69 patients with BVH were analyzed. Factors studied included patient characteristics, subjective complaints and physical function. Outcome measures included symptom intensity, balance confidence, quality of life, gait speed, fall risk, and dynamic visual acuity. Bivariate correlations were used to examine relationships of patient characteristics and baseline measures with outcome measures. One-way ANOVAs were used to compare outcomes in patients with BVH versus unilateral vestibular hypofunction (UVH).

**RESULTS:**

As a group, patients with BVH improved in all outcome measures except disability following a course of vestibular rehabilitation (VR); however, only 38-86% demonstrated a meaningful improvement, depending on the specific outcome measure examined. Several factors measured at baseline - age, DGI score, gait speed and perceived dysequilibrium - were associated with outcomes. For example, greater age was related to higher DVA scores at discharge; lower initial DGI scores were related to higher Disability scores at discharge. Compared to patients with UVH, reported previously [9], a smaller percentage of patients with BVH improve and to a lesser extent.

**CONCLUSION:**

Consideration of baseline factors may provide guidance for setting patient goals. Further research is needed determine what factors predict outcome and to develop more effective treatment strategies for those patients who do not improve.

**KEYWORDS:**

Vestibular rehabilitation; bilateral vestibular hypofunction; outcomes

PMID: 26756134

**Vest rehab**

J Community Health. 2015 Aug;40(4):802-7. doi: 10.1007/s10900-015-0003-7.

**Assessment of Vestibular Rehabilitation Therapy Training and Practice Patterns.**

Bush ML<sup>1</sup>, Dougherty W.

**Abstract**

Vestibular rehabilitation therapy (VRT) can benefit patients with a variety of balance and vestibular disorders. This expanding field requires knowledgeable and experienced therapists; however, the practice and experience of those providing this care may vary greatly. The purpose of this study was to analyze variations in training and practice patterns among practicing vestibular rehabilitation therapists. Case-controlled cohort study. Investigation of outpatient physical therapy and audiology practices that offer vestibular rehabilitation conducted by a tertiary academic referral center. Questionnaire-based investigation of level of training in vestibular disorders and therapy, practice patterns of vestibular rehabilitation, and referral sources for VRT patients. We identified 27 subjects within the state of Kentucky who practice vestibular rehabilitation and the questionnaire response rate was 63%. Responses indicated that 53% of respondents had no training in VRT during their professional degree program. Attendance of a course requiring demonstration of competence and techniques was 24% of participants. The development of VRT certification was significantly more favored by those who attended such courses compared with those who did not ( $p = 0.01$ ). 50% of therapists have direct access to patients without physician referrals.

There is a wide range of educational background and training among those practicing VRT. This variability in experience may affect care provided within some communities. Certification is not necessary for the practice of VRT but the development of certification is favored among some therapists to improve standardization of practice of this important specialty.

PMID: 25700790

## 16. CONCUSSIONS

### Types of trauma

Med Sci Sports Exerc. 2016 Feb 11. [

#### **The Effect of Head Impact Location on Day of Diagnosed Concussion in College Football.**

Liao S<sup>1</sup>, Lynall RC, Mihalik JP.

Abstract

#### **INTRODUCTION:**

Scientists and clinicians have attempted to identify and understand biomechanical factors that influence concussion likelihood. The effect of impact frequency to a given head location prior to the concussion has not been evaluated. To compare the frequency of impacts to a given head location on days of diagnosed concussion to the frequency of impacts to a given head location prior to kinematically matched non-concussive impacts.

#### **METHODS:**

Head impact data were gathered from 33 Division I National Collegiate Athletic Association football players. Twenty-four concussions were identified and matched with impacts of similar kinematic and injury criterion values (linear acceleration, rotational acceleration, Gadd Severity Index, Head Injury Criterion) that occurred during the same event type (game, practice, or scrimmage). Additionally, these same matching criteria were employed to match all players to the closest kinematic/same player group. All impacts within a session prior to the impact of interest (concussive or matched impact) were analyzed.

#### **RESULTS:**

On days of diagnosed concussion, the concussive group sustained a lower percentage of impacts to the front of the head (34.5%) and a greater frequency of impacts to the sides (19.6%) and top (18.9%) of the head ( $\chi(3)=10.23$ ,  $P=0.017$ ) as compared to the matched non-concussive group (front=42.5%, sides=16.6%, top=14.0%). No significant difference in frequency was found in impacts to the back of the head.

#### **CONCLUSION:**

It may be more difficult to mitigate concussive forces sustained in impacts to the top and sides of the head than the front of the head. These findings fall in line with previous research demonstrating reduced impact magnitudes may lessen concussion risk. Studying appropriate training paradigms to develop safer playing techniques on the field are warranted.

PMID: 26871990

## 17. SHOULDER GIRDLE

### Scapula muscles

#### Superficial and Deep Scapulothoracic Muscle EMG Activity During Different Types of Elevation Exercises in the Scapular Plane

**Authors:** Birgit Castelein, PT, MsC<sup>1</sup>, Barbara Cagnie, PT, PhD<sup>1</sup>, Thierry Parlevliet, MD<sup>2</sup>, Ann Cools, PT, PhD<sup>1</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2016 **Volume:**0 **Issue:**0 **Pages:**1–26 **DOI:**10.2519/jospt.2016.5927

**Study Design** Controlled laboratory study.

**Background** In scapular rehabilitation training, exercises that include a humeral elevation component in the scapular plane are commonly implemented. While performing humeral elevation, the scapula plays an important role as it has to create a stable basis for the glenohumeral joint. However, a comparison of both deep and superficial muscle activity of the scapula between different types of elevation exercises is lacking and would be helpful for the clinician in the choice of exercises.

**Objectives** To evaluate scapulothoracic muscle activity during different types of elevation exercises in the scapular plane.

**Methods** Fine-Wire(Levator Scapulae(LS),Pectoralis Minor(Pm) and Rhomboid Major(RM)) and surface EMG(Upper(UT),Middle(MT), Lower(LT) Trapezius and Serratus Anterior(SA)) measured scapulothoracic muscle activity in 21 healthy subjects while performing different elevation tasks in the scapular plane: scaption (elevation scapular plane), towel wall slide and elevation with external rotation (Theraband®). The exercises were performed without and with additional load. Possible differences between the exercises and the load were studied with a linear mixed model.

**Results** Performing elevation in the scapular plane with an external rotation component resulted in higher MT and LT activity in comparison with scaption and wall slide. UT was activated to its highest during scaption. Pm and SA showed the highest activity during the towel wall slide. The towel wall slide activated the retractors to a lesser degree (MT, LT, LS, RM). Adding load resulted in higher muscle activity of all muscles, with some muscles showing a different activation pattern between the elevation exercises pending on the loading.

#### Conclusion

Scaption activated UT to its highest. The addition of an extra external rotation component could be used when the goal is to activate LT and MT. The towel wall slide exercise was found to increase Pm activity. Adding load resulted in higher muscle activity. Some muscles showed a different activation pattern between the elevation exercises pending on the loading. The findings of this study give information about which elevation exercises a clinician can choose when the aim is to facilitate specific muscle scapulothoracic activity. *J Orthop Sports Phys Ther*, Epub 11 Jan 2016. doi:10.2519/jospt.2016.5927

**Level of Evidence** Diagnosis, 2b. *J Orthop Sports Phys Ther*, Epub 11 Jan 2016. doi:10.2519/jospt.2016.5927

Keyword: elevation, EMG, exercises, scapula

## 24. ELBOW

### Epicondylitis

Eur J Pain. 2016 Feb 12. doi: 10.1002/ejp.841.

#### **Altered function of intracortical networks in chronic lateral epicondylalgia.**

Burns E<sup>1</sup>, Chipchase LS<sup>1</sup>, Schabrun SM<sup>1</sup>.

Abstract

#### **BACKGROUND:**

Lateral epicondylalgia (LE) is a musculotendinous condition characterized by persistent pain, sensorimotor dysfunction and motor cortex reorganization. Although there is evidence linking cortical reorganization with clinical symptoms in LE, the mechanisms underpinning these changes are unknown. Here we investigated activity in motor cortical (M1) intracortical inhibitory and facilitatory networks in individuals with chronic LE and healthy controls.

#### **METHODS:**

Surface electromyography was recorded bilaterally from the extensor carpi radialis brevis (ECRB) muscle of 14 LE (4 men, 41.5 ± 9.9 years) and 14 control participants (4 men, 42.1 ± 11.1 years). Transcranial magnetic stimulation of M1 was used to evaluate resting and active motor threshold, corticomotor output, short- (SICI) and long-latency intracortical inhibition (LICI) and intracortical facilitation (ICF) of both hemispheres.

#### **RESULTS:**

In individuals with LE, SICI ( $p = 0.005$ ), ICF ( $p = 0.026$ ) and LICI ( $p = 0.046$ ) were less in the M1 contralateral to the affected ECRB muscle compared with healthy controls. Motor cortical threshold (rest:  $p = 0.57$ , active:  $p = 0.97$ ) and corticomotor output ( $p = 0.15$ ) were similar between groups. No differences were observed between individuals with LE and healthy controls for the M1 contralateral to the unaffected ECRB muscle.

#### **CONCLUSIONS:**

These data provide evidence of less intracortical inhibition mediated by both GABA<sub>A</sub> and GABA<sub>B</sub> receptors, and less intracortical facilitation in the M1 contralateral to the affected ECRB in individuals with LE compared with healthy controls. Similar changes were not present in the M1 contralateral to the unaffected ECRB. These changes may provide the substrate for M1 reorganization in chronic LE and could provide a target for future therapy.

#### **WHAT DOES THIS STUDY ADD:**

Lateral epicondylalgia (LE) is a common musculoskeletal condition characterized by elbow pain and sensorimotor dysfunction. The excitability and organization of the motor cortical representation of the wrist extensor muscles is altered in LE, but the mechanisms that underpin these changes are unknown. Evidence of less intracortical inhibition mediated by both GABA<sub>A</sub> and GABA<sub>B</sub> receptors, and less intracortical facilitation mediated by NMDA receptors, in the M1 contralateral to the affected extensor carpi radialis brevis muscle in chronic LE compared with healthy controls. Altered activity in intracortical networks may contribute to altered motor cortex organization in LE and could provide a potential target for future treatments.

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PMID: 26871462

**25. WRIST AND HAND****Scapholunate kinematics**

Skeletal Radiol. 2016 Apr;45(4):437-46. doi: 10.1007/s00256-015-2308-0. Epub 2015 Dec 14.

**Scapholunate kinematics of asymptomatic wrists in comparison with symptomatic contralateral wrists using four-dimensional CT examinations: initial clinical experience.**

Demehri S<sup>1</sup>, Hafezi-Nejad N<sup>2</sup>, Morelli JN<sup>2</sup>, Thakur U<sup>2</sup>, Lifchez SD<sup>3</sup>, Means KR<sup>4</sup>, Eng J<sup>2</sup>, Shores JT<sup>3</sup>.

Abstract

**OBJECTIVES:**

Using four-dimensional CT scan (4DCT), we aimed at showing the kinematics of scapholunate (SL) interval in asymptomatic wrists in comparison with symptomatic contralateral wrists with inconclusive radiographic findings.

**METHODS:**

This is an IRB approved, HIPPA compliant, retrospective study. Patients suspected of SL interosseous ligament (SLIL) injuries were referred for further evaluation of chronic wrist pain (>3 months). Twelve wrists (11 subjects) with chronic symptoms and inconclusive plain radiographs and 10 asymptomatic wrists (in 10 different subjects) were scanned using 4DCT. The minimum SL interval was measured during three wrist motions: relaxed-to-clenched fist, flexion-to-extension, and radial-to-ulnar-deviation. Changes were recorded using double-oblique multiplanar reformation technique.

**RESULTS:**

We extracted the normal limits of the SL interval as measured by dynamic CT scanning during active motion in asymptomatic wrists. In asymptomatic wrists, the average SL interval was observed to be smaller than 1 mm during all motions. In symptomatic wrists, during exams performed with clenched fist (SL interval (mean  $\pm$  SD) = 2.53  $\pm$  1.19 mm), extension (2.54  $\pm$  1.48 mm) or ulnar deviation (2.06  $\pm$  1.12 mm), the average SL interval was more than 2 mm. In contrast to symptomatic wrists, no significant change in SL interval measurements was detected during wrist motions in asymptomatic wrists. There was a mild to moderate correlation between SL interval change and presence/absence of symptoms (point-biserial correlation coefficients: 0.29-0.55).

**CONCLUSION:**

In patients with wrist pain suspicious for SLIL injury and inconclusive radiographs, SL interval increase can be detected with 4DCT in the symptomatic wrist compared to the asymptomatic wrist.

**KEYWORDS:**

Chronic wrist pain; Four-dimensional computed tomography; Kinematics; Scapholunate interosseous ligament injury

PMID: 26659662

**31. KNEE****Injuries**

Am J Sports Med. 2016 Feb;44(2):318-23. doi: 10.1177/0363546515613076. Epub 2015 Nov 30.

**Is Knee Separation During a Drop Jump Associated With Lower Extremity Injury in Adolescent Female Soccer Players?**

O'Kane JW<sup>1</sup>, Tencer A<sup>2</sup>, Neradilek M<sup>3</sup>, Polissar N<sup>3</sup>, Sabado L<sup>2</sup>, Schiff MA<sup>4</sup>.

Abstract

**BACKGROUND:**

Knee injuries are common in older adolescent and adult female soccer players, and abnormal valgus knee appearance characterized by low normalized knee separation (NKS) is a proposed injury risk factor. What constitutes normal NKS in younger adolescents and whether low NKS is an injury risk factor are unknown.

**PURPOSE:**

To determine the normal range of NKS using a drop-jump test in female perimenarchal youth soccer players and whether low NKS contributes to lower extremity injuries or knee injuries.

**STUDY DESIGN:**

Cohort study; Level of evidence, 2.

**METHODS:**

From 2008 to 2012, a total of 351 female elite youth soccer players (age range, 11-14 years) were followed for 1 season, with complete follow-up on 92.3% of players. Baseline drop-jump testing was performed preseason. Lower extremity injuries during the season were identified using a validated, Internet-based injury surveillance system with weekly email reporting. Normalized knee separation at prelanding, landing, and takeoff was categorized 2 ways: as  $\leq 10$ th percentile (most extreme valgus appearance) compared with  $> 10$ th percentile and as a continuous measure of 1 SD. Poisson regression modeling with adjustment for clustering by team estimated the relative risk (RR) and 95% confidence interval (CI) of the association between the NKS and the risk of lower extremity and knee injury, stratified by menarche.

**RESULTS:**

Of the study participants, 134 players experienced 173 lower extremity injuries, with 43 (24.9%) knee injuries. For postmenarchal players (n = 210), those with NKS  $\leq 10$ th percentile were at 92% increased risk of lower extremity injury (RR, 1.92; 95% CI, 1.17-3.15) and a 3.62-fold increased risk of knee injury (RR, 3.62; 95% CI, 1.18-11.09) compared with NKS  $> 10$ th percentile at prelanding and landing, respectively. Among postmenarchal players, there was an 80% increased risk of knee injury (RR, 1.80; 95% CI, 1.01-3.23) with a decrease of 1 SD in landing NKS and a 66% increased risk of knee injury (RR, 1.66; 95% CI, 1.04-2.64) with a decrease of 1 SD in takeoff NKS. Among premenarchal players (n = 141), there was no statistically significant association between the NKS at prelanding, landing, and takeoff and the risk of lower extremity or knee injury.

**CONCLUSION:**

Low NKS was associated with increased risk of lower extremity and knee injury only among postmenarchal players.

**KEYWORDS:** *female; knee injury; knee separation distance; lower extremity injury; pediatric; soccer*

PMID:26620296

**32 A. KNEE/ACL****Longevity of**

Am J Sports Med. 2016 Feb;44(2):384-92. doi: 10.1177/0363546515623032. Epub 2016 Jan 12.

**Fifteen-Year Survival of Endoscopic Anterior Cruciate Ligament Reconstruction in Patients Aged 18 Years and Younger.**

Morgan MD<sup>1</sup>, Salmon LJ<sup>2</sup>, Waller A<sup>3</sup>, Roe JP<sup>3</sup>, Pinczewski LA<sup>4</sup>.

**Abstract**

**BACKGROUND:** The current body of literature surrounding anterior cruciate ligament (ACL) survival and the variables contributing to further ACL injuries after primary ACL reconstruction in children and adolescents is limited, with no long-term evidence examining the incidence and contributing factors of further ACL injuries in this younger patient population.

**PURPOSE:** To determine the long-term survival of the ACL graft and the contralateral ACL (CACL) after primary reconstruction in patients aged  $\leq 18$  years and to identify the factors that increase the odds of subsequent ACL injuries.

**STUDY DESIGN:** Case series; Level of evidence, 4.

**METHODS:** Patients having undergone primary ACL reconstruction at age  $\leq 18$  years between 1993 and 1998 who were included in a prospective database by a single surgeon were considered for this study. Single-incision endoscopic ACL reconstruction was performed with either an autologous bone-patellar tendon-bone graft or a hamstring tendon graft. At a minimum of 15 years after ACL reconstruction, patients completed a subjective survey involving the International Knee Documentation Committee (IKDC) questionnaire in addition to questions regarding current symptoms, further ACL injuries, family history of ACL injury, and current level of activity.

**RESULTS:** A total of 288 adolescents (age range, 13-18 years) met the inclusion criteria, of whom 242 (84%) were reviewed at a mean of 16 years and 6 months after ACL reconstruction. Of these patients, 75 (31%) sustained a further ACL injury: 27 (11.2%) suffered an ACL graft rupture, 33 suffered a CACL injury (13.6%), and 15 sustained both an ACL graft rupture and a CACL injury (6.2%) over 15 years. Survival of the ACL graft was 95%, 92%, 88%, 85%, and 83% at 1, 2, 5, 10, and 15 years, respectively, and survival of the CACL was 99%, 98%, 90%, 83%, and 81%, respectively. Survival of the ACL graft was less favorable in those with a family history of ACL injury than in those without a family history (69% vs 90%, respectively; hazard ratio [HR], 3.6;  $P = .001$ ). Survival of the CACL was less favorable in male patients than in female patients (75% vs 88%, respectively; HR, 2.1;  $P = .03$ ) and in those who returned to competitive team ball sports than in those who did not (78% vs 89%, respectively; HR, 2.3;  $P = .05$ ).

**CONCLUSION:** After ACL reconstruction in patients aged  $\leq 18$  years, a further ACL injury occurred in 1 in 3 patients over 15 years. The 15-year survival rate of the ACL graft was 83%, and the 15-year survival rate of the CACL was 81%. The ACL graft and CACL were most vulnerable within the first 5 years after index surgery. A family history of ACL rupture significantly increased the risk for ACL graft ruptures, and a CACL injury was more common in male patients and those who returned to team ball sports. High IKDC scores and continued participation in sports were maintained over the long term after ACL reconstruction in the adolescent population.

**KEYWORDS:** ACL reconstruction; adolescent; contralateral ACL; graft rupture; juvenile; long term; survivorship

PMID:2675903

**Mechanical loading**

Am J Sports Med. 2016 Feb;44(2):425-32. doi: 10.1177/0363546515618380. Epub 2015 Dec 18.

**Greater Mechanical Loading During Walking Is Associated With Less Collagen Turnover in Individuals With Anterior Cruciate Ligament Reconstruction.**

Pietrosimone B<sup>1</sup>, Blackburn JT<sup>2</sup>, Harkey MS<sup>3</sup>, Luc BA<sup>3</sup>, Hackney AC<sup>4</sup>, Padua DA<sup>3</sup>, Driban JB<sup>5</sup>, Spang JT<sup>6</sup>, Jordan JM<sup>7</sup>.

Abstract

**BACKGROUND:**

Individuals who have sustained an anterior cruciate ligament (ACL) injury and undergo ACL reconstruction (ACLR) are at higher risk of developing knee osteoarthritis. It is hypothesized that altered knee loading may influence the underlying joint metabolism and hasten development of posttraumatic knee osteoarthritis.

**PURPOSE:**

To explore the associations between serum biomarkers of cartilage metabolism and peak vertical ground-reaction force (vGRF) and vGRF loading rate in the injured and uninjured limbs of individuals with ACLR.

**STUDY DESIGN:**

Descriptive laboratory study.

**METHODS:**

Patients with a history of a primary unilateral ACLR who had returned to unrestricted physical activity (N = 19) participated in the study. Resting blood was collected from each participant before completing 5 walking gait trials at a self-selected comfortable speed. Peak vGRF was extracted for both limbs during the first 50% of the stance phase of gait, and the linear vGRF loading rate was determined between heel strike and peak vGRF. Sera were assessed for collagen breakdown (collagen type II cleavage product [C2C]) and synthesis (collagen type II C-propeptide [CPII]), as well as aggrecan concentrations, via commercially available specific enzyme-linked immunosorbent assays. Pearson product-moment correlations (r) and Spearman rank-order correlations (ρ) were used to evaluate associations between loading characteristics and biomarkers of cartilage metabolism.

**RESULTS:**

Lower C2C:CPII ratios were associated with higher peak vGRF in the injured limb (ρ = -0.59, uncorrected P = .007). There were no significant associations between peak vGRF or linear vGRF loading rate and CPII, C2C, or aggrecan serum concentrations.

**CONCLUSION:**

Lower C2C:CPII ratios were associated with higher peak vGRF in the ACLR limb during gait, suggesting that higher peak loading in the ACLR limb is related to lower type II collagen breakdown relative to type II collagen synthesis.

**CLINICAL RELEVANCE:**

These data suggest that type II collagen synthesis may be higher relative to the amount of type II collagen breakdown in the ACLR limb with higher lower extremity loading. Future study should determine if metabolic compensations to increase collagen synthesis may affect the risk of developing osteoarthritis after ACLR.

**KEYWORDS:** *cartilage; ground-reaction force; knee; osteoarthritis; posttraumatic*

PMID:26684662

## Restrains of the knee

Am J Sports Med. 2016 Feb;44(2):345-54. doi: 10.1177/0363546515614312. Epub 2015 Dec 10.

**The Role of the Anterolateral Structures and the ACL in Controlling Laxity of the Intact and ACL-Deficient Knee.**

Kittl C<sup>1</sup>, El-Daou H<sup>2</sup>, Athwal KK<sup>2</sup>, Gupte CM<sup>3</sup>, Weiler A<sup>4</sup>, Williams A<sup>5</sup>, Amis AA<sup>6</sup>.

Abstract

**BACKGROUND:**

Anterolateral rotatory instability (ALRI) may result from combined anterior cruciate ligament (ACL) and lateral extra-articular lesions, but the roles of the anterolateral structures remain controversial.

**PURPOSE:**

To determine the contribution of each anterolateral structure and the ACL in restraining simulated clinical laxity in both the intact and ACL-deficient knee.

**STUDY DESIGN:**

Controlled laboratory study.

**METHODS:**

A total of 16 knees were tested using a 6 degrees of freedom robot with a universal force-moment sensor. The system automatically defined the path of unloaded flexion/extension. At different flexion angles, anterior-posterior, internal-external, and internal rotational laxity in response to a simulated pivot shift were tested. Eight ACL-intact and 8 ACL-deficient knees were tested. The kinematics of the intact/deficient knee was replayed after transecting/resecting each structure of interest; therefore, the decrease in force/torque reflected the contribution of the transected/resected structure in restraining laxity. Data were analyzed using repeated-measures analyses of variance and paired t tests.

**RESULTS:**

For anterior translation, the intact ACL was clearly the primary restraint. The iliotibial tract (ITT) resisted 31% ± 6% of the drawer force with the ACL cut at 30° of flexion; the anterolateral ligament (ALL) and anterolateral capsule resisted 4%. For internal rotation, the superficial layer of the ITT significantly restrained internal rotation at higher flexion angles: 56% ± 20% and 56% ± 16% at 90° for the ACL-intact and ACL-deficient groups, respectively. The deep layer of the ITT restrained internal rotation at lower flexion angles, with 26% ± 9% and 33% ± 12% at 30° for the ACL-intact and ACL-deficient groups, respectively. The other anterolateral structures provided no significant contribution. During the pivot-shift test, the ITT provided 72% ± 14% of the restraint at 45° for the ACL-deficient group. The ACL and other anterolateral structures made only a small contribution in restraining the pivot shift.

**CONCLUSION:**

The ALL and anterolateral capsule had a minor role in restraining internal rotation; the ITT was the primary restraint at 30° to 90° of flexion.

**CLINICAL RELEVANCE:**

The ITT showed large contributions in restraining anterior subluxation of the lateral tibial plateau and tibial internal rotation, which constitute pathological laxity in ALRI. In cases with ALRI, an ITT injury should be suspected and kept in mind if an extra-articular procedure is performed.

**KEYWORDS:** *anterior cruciate ligament; anterolateral rotatory instability; biomechanics; iliotibial tract*

PMID:26657572

**Return to soccer**

Am J Sports Med. 2016 Feb;44(2):433-9. doi: 10.1177/0363546515614315. Epub 2015 Dec 4.

**Rates and Determinants of Return to Play After Anterior Cruciate Ligament Reconstruction in National Collegiate Athletic Association Division I Soccer Athletes: A Study of the Southeastern Conference.**

Howard JS<sup>1</sup>, Lembach ML<sup>2</sup>, Metzler AV<sup>3</sup>, Johnson DL<sup>4</sup>.

Abstract

**BACKGROUND:**

Factors and details regarding return to play in elite, collegiate female soccer athletes after an anterior cruciate ligament (ACL) injury and reconstruction have not been well studied.

**PURPOSE:**

To evaluate return to play among collegiate female soccer players, specifically examining the effect of surgical and individual athlete characteristics on the return-to-play rate.

**STUDY DESIGN:**

Descriptive epidemiology study.

**METHODS:**

Sports medicine and athletic training staff at institutions from the National Collegiate Athletic Association Southeastern Conference (SEC) were contacted to request participation in the study. All institutions were sent a standardized spreadsheet with response choices and instructions regarding athlete inclusion criteria. Athlete, injury, surgical technique, and return-to-play data were requested for ACL reconstructions performed on female soccer athletes at the participating institutions over the previous 8 years.  $\chi^2$  analyses were used to compare the return-to-play rate by year in school, scholarship status, position, depth chart status, procedure, graft type, graft fixation, concomitant procedures, and previous ACL injuries.

**RESULTS:**

All 14 of the SEC institutions chose to participate and provided data. A total of 80 ACL injuries were reported, with 79 surgical reconstructions and return-to-play data for 78 collegiate soccer athletes. The overall return-to-play rate was 85%. There was a statistical significance in return-to-play rates favoring athletes in earlier years of eligibility versus later years ( $P < .001$ ). Athletes in eligibility years 4 and 5 combined had a return-to-play rate of only 40%. Scholarship status likewise showed significance ( $P < .001$ ), demonstrating a higher return-to-play rate for scholarship athletes (91%) versus nonscholarship athletes (46%). No significant differences in return-to-play rates were observed based on surgical factors, including concomitant knee procedures, graft type, and graft fixation method.

**CONCLUSION:**

Collegiate female soccer athletes have a high initial return-to-play rate. Undergoing ACL reconstruction earlier in the college career as well as the presence of a scholarship had a positive effect on return to play. Surgical factors including graft type, fixation method, tunnel placement technique, concomitant knee surgeries, and revision status demonstrated no significant effect on the return-to-play rate.

**KEYWORDS:**

anterior cruciate ligament; female athlete; return to play

PMID: 26637285

**Hip strength and predicative ACL**

Am J Sports Med. 2016 Feb;44(2):355-61. doi: 10.1177/0363546515616237. Epub 2015 Dec 8.

**Hip Muscle Strength Predicts Noncontact Anterior Cruciate Ligament Injury in Male and Female Athletes: A Prospective Study.**

Khayambashi K<sup>1</sup>, Ghoddosi N<sup>1</sup>, Straub RK<sup>2</sup>, Powers CM<sup>3</sup>.

**BACKGROUND:**

Prospective studies have reported that abnormal movement patterns at the trunk, hip, and knee are associated with noncontact anterior cruciate ligament (ACL) injuries. Impaired hip strength may underlie these abnormal movement patterns, suggesting that diminished hip strength may increase the risk of noncontact ACL injury.

**PURPOSE:**

To determine whether baseline hip strength predicts future noncontact ACL injury in athletes.

**STUDY DESIGN:**

Case-control study; Level of evidence, 3.

**METHODS:**

Before the start of the competitive season, isometric hip strength (external rotation and abduction) was measured bilaterally by use of a handheld dynamometer in 501 competitive athletes (138 female and 363 male athletes) participating in various sports. During the sport season, ACL injury status was recorded, and injured athletes were further classified based on the mechanism of injury (noncontact vs contact). After the season, logistic regression was used to determine whether baseline hip strength predicted future noncontact ACL injury. Receiver operating characteristic (ROC) curves were constructed independently for each strength measure to determine the clinical cutoff value between a high-risk and low-risk outcome.

**RESULTS:**

A total of 15 noncontact ACL injuries were confirmed (6 females, 9 males), for an overall annual incidence of 3.0% (2.5% for males, 4.3% for females). Baseline hip strength measures (external rotation and abduction) were significantly lower in injured athletes compared with noninjured athletes ( $P = .003$  and  $P < .001$ , respectively). Separate logistic regression models indicated that impaired hip strength increased future injury risk (external rotation: odds ratio [OR] = 1.23 [95% CI, 1.08-1.39],  $P = .001$ ; abduction: OR = 1.12 [95% CI, 1.05-1.20],  $P = .001$ ). Clinical cutoffs to define high risk were established as external rotation strength  $\leq 20.3\%$  BW (percentage of body weight) or abduction strength  $\leq 35.4\%$  BW.

**CONCLUSION:**

Measures of preseason isometric hip abduction and external rotation strength independently predicted future noncontact ACL injury status in competitive athletes. The study data suggest that screening procedures to assess ACL injury risk should include an assessment of isometric hip abduction and/or external rotation strength.

**KEYWORDS:**

anterior cruciate ligament (ACL) injury; hip abduction strength; hip external rotation strength; knee injury prevention; noncontact; prospective study

PMID: 26646514

**34. PATELLA****Core function diminished in PFP**

Knee. 2016 Feb 9. pii: S0968-0160(16)00009-0. doi: 10.1016/j.knee.2016.01.008

**Core muscle recruitment pattern during voluntary heel raises is different between patients with patellofemoral pain and healthy individuals.**

Biabanimoghadam M<sup>1</sup>, Motealleh A<sup>2</sup>, Cowan SM<sup>3</sup>.

Abstract

**BACKGROUND:**

Recent studies suggest that the inconsistent outcomes of patellofemoral pain (PFP) treatment may result from the unclear understanding of changes in the structures remote from the knee joint. Due to the crucial influence of core stability on the knee function, this study aimed to evaluate the recruitment pattern of core muscles in individuals with and without PFP.

**METHODS:**

Sixty women aged 18 to 40years, including 30 subjects diagnosed with PFP and 30 healthy controls rose on to their toes as quickly and strongly as possible in response to a sound alarm in standing position. Electromyographic onsets of the transversus abdominis (TrA)/internal oblique (IO), erector spinae (ES), and gluteus medius (GM) muscles were expressed relative to the electromyographic onset of the prime mover (i.e. soleus). Independent t-tests were performed to compare the onsets of each muscle between the groups. The nonparametric Friedman test and the post-hoc of Wilcoxon signed-rank test were used to describe the muscle activation pattern within the groups.

**RESULTS:**

The results revealed different recruitment patterns of the core muscles between the groups. In the healthy group the GM and TrA/IO contracted, almost simultaneously, in anticipation of the prime mover contraction (sol). However, in PFP subjects a significant delay in the contraction of TrA/IO changed the pattern of muscle activation.

**CONCLUSION:**

The findings demonstrate that muscular stabilization of spine is altered in the presence of PFP and suggest that treatment techniques aimed at improving core stability could be appropriate in the management of PFP.

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**KEYWORDS:**

Electromyography; Muscle; Patellofemoral pain; Rehabilitation

PMID: 26873794

## Exercise

**Exercise for treating patellofemoral pain syndrome: an abridged version of Cochrane systematic review**

European Journal of Physical and Rehabilitation Medicine, 02/18/2016 Van Der Heijden RA, et al.

The aim of this study is to assess the effects of exercise therapy in people with PFPS. This review found very low quality but consistent evidence that exercise therapy for PFPS may result in clinically important reduction in pain and improvement in functional ability, as well as enhancing long-term recovery. There is some very low quality evidence that hip plus knee exercises may be more effective in reducing pain than knee exercise alone.

**Methods**

- A search was performed in nine databases up to May 2014, including the Cochrane Register, MEDLINE and EMBASE.
- Randomised and quasi-randomised trials evaluating the effect of exercise therapy in adolescents and adults with PFPS were considered for inclusion. Two review authors independently selected trials, extracted data and assessed risk of bias.

**Results**

- In total, 31 trials including 1690 participants were included in this review, of which most were at high risk of performance bias and detection bias due to lack of blinding.
- The included studies provided evidence for: exercise therapy versus control; exercise therapy versus other conservative interventions (e.g. taping); and different exercises or exercise programmes. Pooled data favoured exercise therapy over control for pain during activity (short term MD -1.46 [-2.39, -0.54]), usual pain (short term estimated MD -1.44 [-2.48, -0.39]), functional ability; (short term estimated MD 12.21 [6.44, 18.09] and long term recovery (RR 1.35 [0.99, 1.84]).
- Pooled data favoured hip and knee exercise over knee exercises alone for pain during activity (short-term MD -2.20 [3.80, -0.60]) and usual pain (short term MD -1.77 [-2.78, -0.76]).

**Patella pain/three subgroups**

Br J Sports Med. 2016 Feb 1. pii: bjsports-2015-094792. doi: 10.1136/bjsports-2015-094792.

**Are there three main subgroups within the patellofemoral pain population? A detailed characterisation study of 127 patients to help develop targeted intervention (TIPPs).**

Selfe J<sup>1</sup>, Janssen J<sup>1</sup>, Callaghan M<sup>2</sup>, Witvrouw E<sup>3</sup>, Sutton C<sup>1</sup>, Richards J<sup>1</sup>, Stokes M<sup>4</sup>, Martin D<sup>5</sup>, Dixon J<sup>5</sup>, Hogarth R<sup>1</sup>, Baltzopoulos V<sup>6</sup>, Ritchie E<sup>7</sup>, Arden N<sup>8</sup>, Dey P<sup>1</sup>.

Abstract

**BACKGROUND:**

Current multimodal approaches for the management of non-specific patellofemoral pain are not optimal, however, targeted intervention for subgroups could improve patient outcomes. This study explores whether subgrouping of non-specific patellofemoral pain patients, using a series of low cost simple clinical tests, is possible.

**METHOD:**

The exclusivity and clinical importance of potential subgroups was assessed by applying à priori test thresholds (1 SD) from seven clinical tests in a sample of adult patients with non-specific patellofemoral pain. Hierarchical clustering and latent profile analysis, were used to gain additional insights into subgroups using data from the same clinical tests.

**RESULTS:**

130 participants were recruited, 127 had complete data: 84 (66%) female, mean age 26 years (SD 5.7) and mean body mass index 25.4 (SD 5.83), median (IQR) time between onset of pain and assessment was 24 (7-60) months. Potential subgroups defined by the à priori test thresholds were not mutually exclusive and patients frequently fell into multiple subgroups. Using hierarchical clustering and latent profile analysis three subgroups were identified using 6 of the 7 clinical tests. These subgroups were given the following nomenclature: (1) 'strong', (2) 'weak and tighter' and (3) 'weak and pronated foot'.

**CONCLUSIONS:**

We conclude that three subgroups of patellofemoral patients may exist based on the results of six clinical tests which are feasible to perform in routine clinical practice. Further research is needed to validate these findings in other data sets and, if supported by external validation, to see if targeted interventions for these subgroups improve patient outcomes.

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**KEYWORDS:**

Knee; Physiotherapy

PMID: 26834185

**37. OSTEOARTHRITIS/KNEE****Varus posture increases OA**

Knee Surg Sports Traumatol Arthrosc. 2016 Feb 1.

**The relationship between constitutional alignment and varus osteoarthritis of the knee.**

Vandekerckhove PT<sup>1,2</sup>, Matlovich N<sup>3</sup>, Teeter MG<sup>3</sup>, MacDonald SJ<sup>3</sup>, Howard JL<sup>3</sup>, Lanting BA<sup>3</sup>.

Abstract

**PURPOSE:**

The role of neutral alignment in total knee arthroplasty (TKA) on short- and long-term outcomes has become controversial. Based on the concept of constitutional varus, it has been suggested that under-correction in TKA in a varus osteoarthritis (OA) population might lead to better clinical outcomes. However, it is still unknown what the relationship between constitutional varus and the development of end-stage OA is. The goal of this study was to analyse the contribution of constitutional varus in a medial OA population and to define a correlation between the constitutional alignment and end-stage varus OA.

**METHODS:**

Based on full-length radiographs, corrected for the intra-articular deformity of the knee, of 315 patients with unilateral end-stage medial OA of the knee (Charnley type A), a correlation in the coronal plane was made between medial end-stage OA and the contralateral non-arthritic side.

**RESULTS:**

With increasing varus alignment in the arthritic limb, the physiologic limb alignment also became more varus. The proportion of constitutional varus rose with increasing overall alignment and was found to be continuous for males. Constitutional varus was three times higher in men when the overall arthritic alignment was greater more than 6° varus.

**CONCLUSION:**

Constitutional varus significantly contributes to varus osteoarthritis and was found to be higher than in the general population.

**LEVEL OF EVIDENCE:**

III.

**KEYWORDS:**

Constitutional varus; Coronal plane alignment; Knee; Osteoarthritis; Varus

PMID: 26831863

### OA guidelines

#### **Defining an international standard set of outcome measures for patients with hip or knee osteoarthritis: Consensus of the international consortium for health outcomes measurement hip and knee osteoarthritis working group**

Arthritis Care & Research , 02/17/2016

**z**Rolfson O, et al.

The authors have defined a Standard Set of outcome measures for monitoring the care of people with clinically diagnosed hip or knee osteoarthritis (OA) that is appropriate for use across all treatment and care settings. They believe this Standard Set provides meaningful, comparable, and easy to interpret measures ready to implement in clinics and/or registries globally. They view this as an initial step that, when combined with cost data, will facilitate value-based healthcare improvements in the treatment of hip and knee OA.

#### Methods

- An international Working Group (WG) of patients, arthroplasty register experts, orthopedic surgeons, primary care physicians, rheumatologists, and physiotherapists representing 10 countries was assembled to review existing literature and practices for assessing outcomes of pharmacological and non-pharmacological OA therapies, including surgery.
- A series of 8 teleconferences, incorporating a modified Delphi process, were held to reach consensus.

#### Results

- The WG reached consensus on a concise set of outcome measures to evaluate patients' joint pain, physical functioning, health-related quality of life, work status, mortality, reoperations, readmissions, and overall satisfaction with treatment result.
- To support analysis of these outcome measures, pertinent baseline characteristics and risk factor metrics were defined.
- Annual outcome measurement is recommended for all patients

**OA pain patterns**

Osteoarthritis Cartilage. 2016 Jan 30. pii: S1063-4584(16)01005-0. doi: 10.1016/j.joca.2016.01.986.

**Location of knee pain in medial knee osteoarthritis: Patterns and associations with self-reported clinical symptoms.**

Van Ginckel A<sup>1</sup>, Bennell KL<sup>2</sup>, Campbell PK<sup>3</sup>, Wrigley TV<sup>4</sup>, Hunter DJ<sup>5</sup>, Hinman RS<sup>6</sup>.

Abstract

**OBJECTIVES:**

To i) document pain location in medial tibiofemoral osteoarthritis (OA) using the patient-administered Photographic Knee Pain Map (PKPM); ii) compare pain severity, nature and likelihood of neuropathic-like symptoms, physical dysfunction and presence of symptoms at other sites across the most common pain patterns.

**DESIGN:**

Baseline data were analysed from 164 participants with medial tibiofemoral OA participating in a randomised controlled trial. Participants completed the PKPM indicating all relevant pain zones of their most painful knee. Pain zones were collapsed into regions to determine patterns of pain. Symptoms were quantified using numeric rating scales (NRS) of pain severity, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Intermittent and Constant Osteoarthritis Pain (ICOAP) and painDETECT questionnaires. Symptoms at other joints were categorised as present/absent.

**RESULTS:**

The medial joint line (n= 123, 75%), patellar tendon (n= 62, 38%) and posterior knee (n=61, 37%) were the most frequently reported pain zones. The most frequent patterns were diffuse (41%), isolated medial (16%), anterior-medial (12%) and medial-posterior (11%) pain. WOMAC and ICOAP scores were higher in the diffuse compared to anterior-medial patterns. Mean PainDETECT scores were higher with both diffuse and medial-posterior pain relative to anterior-medial pain.

**CONCLUSION:**

Only 16% of the cohort indicated isolated medial knee pain, whilst a diffuse pain pattern was most common. People with diffuse knee pain reported more severe pain and physical dysfunction than those with anterior-medial pain. Prevalence of possible/likely neuropathic-like symptoms tended to be more frequent in diffuse and posterior-medial patterns compared to anterior-medial pain.

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**KEYWORDS:**

knee; osteoarthritis; pain; pain map; physical function

PMID: 26836285

**38 A. FOOT AND ANKLE**

Experimental Gerontology

**The involvement of ankle muscles in maintaining balance in the upright posture is higher in elderly fallers**

- T. Cattagni<sup>a, b, ,</sup>, G. Scaglioni<sup>a, b</sup>, D. Laroche<sup>b, c</sup>, V. Gremeaux<sup>b, c, d</sup>,
- 

doi:10.1016/j.exger.2016.02.010

**Highlights**

- This study investigated the mechanical contribution of ankle muscles to the upright stance in young adults, elderly non-fallers and elderly fallers.
- Elderly fallers generated greater ankle muscle relative torque than non-fallers when maintaining upright posture.
- This greater contribution of ankle muscles to upright stance was associated with higher postural instability.
- The postural stability impairment observed with aging is highly related to ankle muscle weakness and particularly to plantar flexor weakness.

**Abstract**

The purpose of this study was to determine whether the mechanical contribution of ankle muscles in the upright stance differed among young adults (YA) (n = 10, age: ~ 24.3), elderly non-fallers (ENF) (n = 12, age: ~ 77.3) and elderly fallers (EF) (n = 20, age: ~ 80.7). Torque and electromyographic (EMG) activity were recorded on the triceps surae and tibialis anterior during maximum and submaximum contractions in the seated position. EMG activity was also recorded in subjects standing still. Plantar flexor (PF) and dorsal flexor (DF) torques generated in the upright posture were estimated from the torque-EMG relationship obtained during submaximum contractions in the seated position. Centre of pressure (CoP) displacement was measured to quantify postural stability. Results showed that, in upright standing, EF generated greater ankle muscle relative torque (i.e. PF + DF torque in the upright stance / PF + DF during maximum isometric torque) than non-fallers (i.e. ENF, YA). The greater involvement of ankle muscles in EF was associated with higher CoP displacement. PF + DF torque in the upright stance was no different among the groups, but PF + DF torque during maximum effort was impaired in older groups compared with YA and was lower in EF than ENF. These results suggest that the postural stability impairment observed with aging is highly related to ankle muscle weakness.

**42. PLANTAR SURFACE****Plantar fasciitis treatment****Physiotherapy for plantar fasciitis: A UK-wide survey of current practice**

Rob Grieve, PhD Shea Palmer, PhD

DOI: <http://dx.doi.org/10.1016/j.physio.2016.02.002>

**Abstract****Objectives**

To identify how United Kingdom (UK) physiotherapists currently diagnose, assess and manage plantar fasciitis in routine practice

**Design**

Online questionnaire survey

**Participants**

Practising physiotherapists across the UK who treat patients with plantar fasciitis.

**Methods**

Physiotherapists were approached via interactive Chartered Society of Physiotherapy (CSP) online networks and an email database of clinical educators in South West England. An online questionnaire was developed by reviewing similar existing physiotherapy surveys and consultation with experienced musculoskeletal researchers/clinicians. Descriptive statistics were used to analyse the data.

**Results**

285 physiotherapists responded, with 257 complete survey responses. Pain on palpation and early morning pain were the most common diagnostic criteria, with some physiotherapists using no formal test criteria. Advice (237/257, 92%), plantar fasciitis pathology education (207/257, 81%) and general stretching exercises (189/257, 74%) were most routinely used. Prefabricated orthotics, custom made orthotics and night splints were seldom used. For the manual therapy approach, the most frequently used modalities were massage, myofascial release, specific soft tissue mobilisations and myofascial trigger point therapy. Commonly used outcome measures were pain assessment, functional tests and range of movement.

**Conclusions**

Physiotherapists appeared to follow most of the established diagnostic criteria for PF, but have not followed established outcome measure guidelines. Advice and education with an emphasis on self-management including calf/hamstring stretching was the most commonly reported treatment approach. There is uncertainty whether this approach accurately reflects clinical practice used throughout the UK, due to potential response bias/unknown response rate and the low number of patients with PF treated by the respondents

**45 A. MANUAL THERAPY LUMBAR & GENERAL****Asthma treatment****Effect of osteopathic maneuvers in the treatment of asthma: review of literature****Rodrigo Medina Vasconcelos Lago; Marco Antônio Figueiredo da Silva Filho; Alan Carlos Nery dos Santos**

doi: <http://dx.doi.org/10.17784/mtprehabJournal.2015.13.262> Man. Ther., Posturology Rehabil. J., vol.13, 2015

**Abstract:**

**Introduction:** Despite the high prevalence of asthma, there is no consensus in the literature regarding non-drug methods for the treatment of their symptoms. Thus, holistic therapies such as osteopathy can be viable alternatives since evidence has shown benefits of osteopathic manipulative treatment of clinical conditions such as asthma. **Objective:** To gather evidence tested osteopathic approach to treating the symptoms, respiratory dysfunction, medication use and quality of life of patients with asthma.

**Method:** Electronic searches were conducted between October and November 2014. It was used as descriptors crossed, or alone in the fields “words”, “subject descriptors”, “title words”, “title” and “abstract” the following keywords combined with Boolean operators AND and OR: Osteopathic Medicine, osteopathic manipulation, osteopathy, Spinal Manipulation, Manual Therapy, Therapy Skull Sacral, Chiropractic, Chiropractic Manipulation, Asthma. Initially they were collected all the articles that addressed the manual features used by osteopathic or chiropractic correlated with the asthma treatment published between 1998 and 2014.

**Results:** It was found 35 articles, of which 28 were excluded because they did not conform to pre-defined criteria. Thus, seven works were part of this review. Four of them are clinical trials, two case studies and a pilot study.

**Conclusion:** Our findings suggest that osteopathic manipulative techniques can be used as non-medicated additional resource in the treatment of patients with asthma. The reviewed studies have identified improving the quality of life, subjective perception of symptoms and reduce the use of drugs.

**Keywords:**

Osteopathic medicine, Manipulation, Osteopathic, Asthma, Physical therapy specialty, Musculoskeletal manipulations.

**45 B. MANUAL THERAPY CERVICAL****Cervicogenic HA's**

Eur Spine J. 2016 Feb 6. [Epub ahead of print]

**Are non-invasive interventions effective for the management of headaches associated with neck pain? An update of the Bone and Joint Decade Task Force on Neck Pain and Its Associated Disorders by the Ontario Protocol for Traffic Injury Management (OPTIMA) Collaboration.**

Varatharajan S<sup>1,2,3</sup>, Ferguson B<sup>4</sup>, Chrobak K<sup>4</sup>, Shergill Y<sup>5</sup>, Côté P<sup>6,7,8</sup>, Wong JJ<sup>1,2</sup>, Yu H<sup>1,2</sup>, Shearer HM<sup>1,2</sup>, Southerst D<sup>1,9</sup>, Sutton D<sup>1,2</sup>, Randhawa K<sup>1,2,3</sup>, Jacobs C<sup>1,10</sup>, Abdulla S<sup>4</sup>, Woitzik E<sup>4</sup>, Marchand AA<sup>11</sup>, van der Velde G<sup>12,13,14</sup>, Carroll LJ<sup>15</sup>, Nordin M<sup>16</sup>, Ammendolia C<sup>17,14,18</sup>, Mior S<sup>2,17</sup>, Ameis A<sup>19</sup>, Stupar M<sup>1</sup>, Taylor-Vaisey A<sup>1</sup>.

Abstract

**PURPOSE:**

To update findings of the 2000-2010 Bone and Joint Decade Task Force on Neck Pain and its Associated Disorders and evaluate the effectiveness of non-invasive and non-pharmacological interventions for the management of patients with headaches associated with neck pain (i.e., tension-type, cervicogenic, or whiplash-related headaches).

**METHODS:**

We searched five databases from 1990 to 2015 for randomized controlled trials (RCTs), cohort studies, and case-control studies comparing non-invasive interventions with other interventions, placebo/sham, or no interventions. Random pairs of independent reviewers critically appraised eligible studies using the Scottish Intercollegiate Guidelines Network criteria to determine scientific admissibility. Studies with a low risk of bias were synthesized following best evidence synthesis principles.

**RESULTS:**

We screened 17,236 citations, 15 studies were relevant, and 10 had a low risk of bias. The evidence suggests that episodic tension-type headaches should be managed with low load endurance craniocervical and cervicospinal exercises. Patients with chronic tension-type headaches may also benefit from low load endurance craniocervical and cervicospinal exercises; relaxation training with stress coping therapy; or multimodal care that includes spinal mobilization, craniocervical exercises, and postural correction. For cervicogenic headaches, low load endurance craniocervical and cervicospinal exercises; or manual therapy (manipulation with or without mobilization) to the cervical and thoracic spine may also be helpful.

**CONCLUSIONS:**

The management of headaches associated with neck pain should include exercise. Patients who suffer from chronic tension-type headaches may also benefit from relaxation training with stress coping therapy or multimodal care. Patients with cervicogenic headache may also benefit from a course of manual therapy.

**KEYWORDS:**

Cervicogenic headache; Headache attributed to whiplash injury; Non-invasive interventions; Systematic review; Tension-type headache

PMID: 26851953

**C spine manip and radiculopathy**

Clin Rehabil. 2016 Feb;30(2):145-55. doi: 10.1177/0269215515570382. Epub 2015 Feb 13.

**Does cervical spine manipulation reduce pain in people with degenerative cervical radiculopathy? A systematic review of the evidence, and a meta-analysis.**

Zhu L<sup>1</sup>, Wei X<sup>2</sup>, Wang S<sup>3</sup>.

Author information

Abstract

**OBJECTIVE:**

To access the effectiveness and safety of cervical spine manipulation for cervical radiculopathy.

**DATA SOURCES:**

PubMed, the Cochrane Central Registry of Controlled Trials (CENTRAL) in the Cochrane Library, EMBASE, Chinese Biomedical Literature Database (CBM), Chinese National Knowledge Infrastructure (CNKI), Chinese Scientific Journal Database (VIP), Wanfang data, the website of Chinese clinical trial registry and international clinical trial registry by US National Institutes of Health.

**REVIEW METHODS:**

Randomized controlled trials that investigated the effects of cervical manipulation compared with no treatment, placebo or conventional therapies on pain measurement in patients with degenerative cervical radiculopathy were searched. Two authors independently evaluated the quality of the trials according to the risk of bias assessment provided by the PEDro (physiotherapy evidence database) scale. RevMan V.5.2.0 software was employed for data analysis. The GRADE approach was used to evaluate the overall quality of the evidence.

**RESULTS:**

Three trials with 502 participants were included. Meta-analysis suggested that cervical spine manipulation (mean difference 1.28, 95% confidence interval 0.80 to 1.75;  $P < 0.00001$ ; heterogeneity:  $\text{Chi}(2) = 8.57$ ,  $P = 0.01$ ,  $I(2) = 77\%$ ) improving visual analogue scale for pain showed superior immediate effects compared with cervical computer traction. The overall strength of evidence was judged to be moderate quality. One out of three trials reported the adverse events and none with a small sample size.

**CONCLUSION:**

There was moderate level evidence to support the immediate effectiveness of cervical spine manipulation in treating people with cervical radiculopathy. The safety of cervical manipulation cannot be taken as an exact conclusion so far.

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**KEYWORDS:**

Neck pain; manipulation; meta-analysis

PMID:25681406

**MT for CG HA's**

Man Ther. 2015 Feb;20(1):148-56. doi: 10.1016/j.math.2014.08.003. Epub 2014 Aug 27.

**Manual therapy for cervicogenic dizziness: Long-term outcomes of a randomised trial.**

Reid SA<sup>1</sup>, Callister R<sup>2</sup>, Snodgrass SJ<sup>2</sup>, Katekar MG<sup>2</sup>, Rivett DA<sup>2</sup>.

Author information

Abstract

Manual therapy is effective for reducing cervicogenic dizziness, a disabling and persistent problem, in the short term. This study investigated the effects of sustained natural apophyseal glides (SNAGs) and passive joint mobilisations (PJM) on cervicogenic dizziness compared to a placebo at 12 months post-treatment. Eighty-six participants (mean age 62 years, standard deviation (SD) 12.7) with chronic cervicogenic dizziness were randomised to receive SNAGs with self-SNAGs (n = 29), PJMs with range-of-motion (ROM) exercises (n = 29), or a placebo (n = 28) for 2-6 sessions over 6 weeks. Outcome measures were dizziness intensity, dizziness frequency (rated between 0 [none] and 5 [>once/day]), the Dizziness Handicap Inventory (DHI), pain intensity, head repositioning accuracy (HRA), cervical spine ROM, balance, and global perceived effect (GPE). At 12 months both manual therapy groups had less dizziness frequency (mean difference SNAGs vs placebo -0.7, 95% confidence interval (CI) -1.3, -0.2, p = 0.01; PJMs vs placebo -0.7, -1.2, -0.1, p = 0.02), lower DHI scores (mean difference SNAGs vs placebo -8.9, 95% CI -16.3, -1.6, p = 0.02; PJMs vs placebo -13.6, -20.8, -6.4, p < 0.001) and higher GPE compared to placebo, whereas there were no between-group differences in dizziness intensity, pain intensity or HRA.

There was greater ROM in all six directions for the SNAG group and in four directions for the PJM group compared to placebo, and small improvements in balance for the SNAG group compared to placebo. There were no adverse effects. These results provide evidence that both forms of manual therapy have long-term beneficial effects in the treatment of chronic cervicogenic dizziness.

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**KEYWORDS:**

Cervical vertebrae; Dizziness; Musculoskeletal manipulation; Neck pain

PMID: 25220110

## Neck tongue syndrome

**Manual Therapy and Exercise for a Patient With Neck-Tongue Syndrome: A Case Report**

**Authors:** Lisa Niethamer, PT, DPT, OCS<sup>1</sup>, Robin Myers, PT, DPT, NCS<sup>2</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2016 **Volume:**0 **Issue:**0 **Pages:**1–30 **DOI:**10.2519/jospt.2016.6195

**Study Design**

Case report.

**Background**

Neck-tongue syndrome (NTS) is defined as neck and/or head pain accompanied by ipsilateral dysesthesia of the tongue with sudden rotation of the head. Proposed causes include compression or irritation of the C2 nerve root as it courses behind the atlantoaxial joint or hypertrophy of the inferior oblique muscle. The primary purpose of this case report is to describe the conservative physical therapy treatment of a patient with uncomplicated NTS.

**Case Description**

The patient was a 13-year-old girl who reported insidious onset of sharp pain in the neck, numbness/tingling of the ipsilateral tongue/face, and tinnitus with cervical rotation. Symptoms occurred several times a week for approximately 10 seconds. Examination revealed impaired function, increased forward head posture, decreased cervical range of motion, and positive neurodynamic assessment. The patient's treatment included manual therapy and exercise for postural stabilization.

**Outcomes**

Following 8 visits, pain of the neck and tongue numbness had resolved. Score on the Patient Specific Functional Scale (PSFS), cervical range of motion (ROM), and posture had also improved. At 22 month follow-up, infrequent, momentary symptoms in the neck and dysesthesia of the tongue were reported. THE PSFS remained the same. Objective measures were normal.

**Discussion**

This case report describes the physical therapy management of an individual with NTS. The management strategy followed a protocol similar to that used for cervicogenic headaches (CH) due to the involvement of the upper cervical spine with both NTS and CH and the lack of evidence for the treatment of NTS.

**Level of Evidence**

Therapy, level 4. *J Orthop Sports Phys Ther*, Epub 11 Jan 2016. doi:10.2519/jospt.2016.6195

Keyword: cervicogenic headache, headache, neck pain, neck-tongue syndrome

### 45 C. MANUAL THERAPY THORACIC

#### Thoracic mob in spondylolisthesis

##### **Mobilisation of the thoracic spine in the management of spondylolisthesis**

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Journal of Bodywork & Movement Therapies , 02/18/2016 Mohanty PP, et al.

The aim of the study is to determine the effects of mobilisation of the hypomobile upper thoracic spine along with conventional flexion exercises and stretching of short hip flexors on the degree of slippage and the functions of the persons with lumbar spondylolisthesis. Low back pain due to spondylolisthesis may be benefited by mobilisation of the thoracic spine along with stretching of short hip flexors, piriformis, lumbar flexion range of motion exercises, core strengthening exercises, etc.

##### Methods

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- All patients with spondylolisthesis were randomly assigned into two groups: Group I – Experimental group, treated with mobilisation of the thoracic spine along with the conventional physiotherapy and Group II – Conventional group, treated with conventional stretching, strengthening, and lumbar flexion exercise programme.

##### Results

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- The experimental group treated with mobilisation of the thoracic spine shows a significant reduction in the percentage of vertebral slip from pre-treatment to post-treatment measurements.

**48 A. STM****Abdominal massage**

Gastroenterol Nurs. 2016 Jan-Feb;39(1):48-59. doi: 10.1097/SGA.0000000000000202.

**The Effect of Abdominal Massage on Constipation and Quality of Life.**

Turan N<sup>1</sup>, Atabek Aşt T.

**Abstract**

This study was a randomized controlled trial aimed to find the impact of abdominal massage application on constipation and quality of life among patients. The sample included 30 intervention (abdominal massage) and 30 control subjects. To collect data, the following were utilized: Patient Information Form, Gastrointestinal Symptom Rating Scale, Constipation Severity Instrument, Bristol Scale Stool Form, Patient Assessment of Constipation Quality of Life (PAC-QOL) Scale, and European Quality of Life Instrument (EQ-5D). The data were collected from among patients in the morning and evening on the fourth, fifth, and sixth days postoperatively. No significant findings were discovered between experimental and control groups in terms of individual characteristics and characteristics that might influence constipation ( $p > .05$ ). It was found that patients who received abdominal massage application defecated more often following their surgery than patients in the control group, which led to a statistically high level of significant difference between the groups ( $p \leq .001$ ). It was also found that the experimental group displayed higher average PAC-QOL and EQ-5D scores on discharge. Findings indicated that abdominal massage applied to patients diagnosed with postoperative constipation reduced symptoms of constipation, decreased time intervals between defecation, and increased quality of life.

PMID: 26825564

**Connective tissue massage**

Man Ther. 2016 Feb;21:144-50. doi: 10.1016/j.math.2015.07.003. Epub 2015 Jul 15.

**Cervical and scapulothoracic stabilization exercises with and without connective tissue massage for chronic mechanical neck pain: A prospective, randomised controlled trial.**

Celenay ST<sup>1</sup>, Kaya DO<sup>2</sup>, Akbayrak T<sup>3</sup>.

**Abstract**

This study was planned to assess and compare the effectiveness of cervical and scapulothoracic stabilization exercise treatment with and without connective tissue massage (CTM) on pain, anxiety, and the quality of life in patients with chronic mechanical neck pain (MNP). Sixty patients with chronic MNP (18-65 years) were recruited and randomly allocated into stabilization exercise with (Group 1, n = 30) and without the CTM (Group 2, n = 30). The program was carried out for 12 sessions, 3 days/week in 4 weeks. Pain intensity with Visual Analog Scale, pressure pain threshold with digital algometer (JTech Medical Industries, ZEVEX Company), level of anxiety with Spielberger State Trait Anxiety Inventory, and quality of life with Short Form-36 were evaluated before and after the treatment. After the program, pain intensity and the level of anxiety decrease, physical health increase in Group 1 and 2 were found ( $p < 0.05$ ). Pressure pain threshold and mental health increase were detected in only Group 1 ( $p < 0.05$ ). The intergroup comparison showed that significant difference in pain intensity at night, pressure pain threshold, state anxiety and mental health were seen in favor of Group 1 ( $p < 0.05$ ). The study suggested that stabilization exercises with and without the CTM might be a useful treatment for patients with chronic MNP.

However, stabilization exercises with CTM might be superior in improving pain intensity at night, pressure pain threshold, state anxiety and mental health compared to stabilization exercise alone.

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**KEYWORDS:**

Connective tissue massage; Neck pain; Stabilization exercise

PMID:26211422

**54. POSTURE****Compensations**

Eur Spine J. 2016 Jan 25.

**A retrospective study to reveal the effect of surgical correction of cervical kyphosis on thoraco-lumbo-pelvic sagittal alignment.**

Lee DH<sup>1</sup>, Ha JK<sup>1</sup>, Chung JH<sup>1</sup>, Hwang CJ<sup>1</sup>, Lee CS<sup>1</sup>, Cho JH<sup>2</sup>.

Abstract

**PURPOSE:**

Recent studies suggest that cervical lordosis is influenced by thoracic kyphosis and that T1 slope is a key factor determining cervical sagittal alignment. However, no previous study has investigated the influence of cervical kyphosis correction on the remaining spinopelvic balance. The purpose of this study is to assess the effect of surgical correction of cervical kyphosis on thoraco-lumbo-pelvic alignment.

**METHODS:**

Fifty-five patients who underwent  $\geq 2$  level cervical fusions for cervical radiculopathy or myelopathy were included. All patients had regional or global cervical kyphosis, which was surgically corrected into lordosis. Radiographic measurements were made using whole spine standing lateral radiographs pre- and postoperatively to analyze various sagittal parameters. The visual analogue scale (VAS) for neck pain and the neck disability index (NDI) were calculated. The paired t test was used to compare pre- and post-operative radiographic measures and functional scores. Correlations between changes in cervical sagittal parameters and those of other sagittal parameters were analyzed by Pearson's correlation method.

**RESULTS:**

Preoperative kyphosis ( $11.4^\circ \pm 8.3^\circ$ ) was corrected into lordosis ( $-9.3^\circ \pm 8.1^\circ$ ). The average fusion levels were  $3.3 \pm 1.0$ . With increasing C2-C7 lordosis after surgery (from  $-3.4^\circ \pm 10.0^\circ$  to  $-15^\circ \pm 7.9^\circ$ ), C0-C2 lordosis decreased significantly (from  $-34.6^\circ \pm 8.2^\circ$  to  $-27.7^\circ \pm 8.0^\circ$ ) ( $P < 0.001$ ). Thoracic kyphosis (from  $24.8 \pm 13.9^\circ$  to  $33.5 \pm 11.9^\circ$ ) and T1 slope (from  $12.8^\circ \pm 7.9^\circ$  to  $20.4^\circ \pm 5.2^\circ$ ) significantly increased after surgery ( $P < 0.001$ ). However, other parameters did not significantly change ( $P > 0.05$ ). Neck pain VAS and NDI scores ( $31.8 \pm 16.2$ ) significantly improved ( $P < 0.001$ ). The degree of increasing C2-C7 lordosis by surgical correction was negatively correlated with changes in both thoracic kyphosis and T1 slope ( $P < 0.01$ ).

**CONCLUSIONS:**

Surgical correction of cervical kyphosis affects T1 slope and thoracic kyphosis, but not lumbo-pelvic alignment. These results indicate that the compensatory mechanisms to minimize positive sagittal malalignment of the head may occur mainly in the thoracic, and not in the lumbosacral spine.

**KEYWORDS:**

Alignment; Cervical vertebrae; Kyphosis; Sagittal balance; T1 slope

PMID: 26810979

**L5 changes and posture**

Eur Spine J. 2016 Jan 27.

**Normative values for the L5 incidence in a subgroup of transitional anomalies extracted from 147 asymptomatic subjects.**

Dominguez D<sup>1</sup>, Faundez A<sup>1</sup>, Demezon H<sup>2</sup>, Cogniet A<sup>2</sup>, Le Huec JC<sup>3</sup>.

Abstract

**PURPOSE:**

Pelvic incidence angle is not always measurable due to lumbosacral transitional vertebrae (LSV). The fifth lumbar vertebra (L5) is rarely abnormal. The purpose of this study was to quantify from full-body standing X-rays, the L5 incidence angle (L5I) in a normal asymptomatic population and to correlate it with standard spino-pelvic parameters taking the sacrum (S1) as a reference.

**METHODS:**

One hundred and forty seven asymptomatic volunteers were enrolled. The ethics committee approved the study protocol. Subjects underwent a low-dose full spine X-ray. 3D reconstructions were obtained and L5I was measured using the upper L5 endplate as the reference instead of the S1 endplate. A group of subjects with LSV was identified and subdivided in two subgroups. Standard spino-pelvic parameters and normative values for the L5 parameters were obtained. Statistical correlations were calculated between the standard and L5 parameters as well as L5I with L1-L5 lordosis in both subgroups.

**RESULTS:**

Twenty two (14.96 %) subjects with LSV were found. Ten of these had an unidentifiable S1 endplate due to a sacralisation of L5. Mean values for the L5I, L5 tilt, L5 slope and L1-L5 lordosis were, respectively, 22.43, 4.65, 17.73, and 45.51 for normal subjects (N = 137) and 32.75, 6.63, 26.38, and 55.02 for sacralisation of L5 subjects (N = 10). Mathematical relationship found:  $L5I = 0.7641 * PI - 17.725$  (R = 0.83) and  $L1-L5 = 0.67 * L5I + 30.7$  (R = 0.64).

**CONCLUSION:**

This prospective study is first to provide normative spino-pelvic values at the L5 level in an asymptomatic population, particularly in case of (LSV) sacralisation of L5 (N = 10) where L5I and L1-L5 lordosis appears to be 10° more important than in normal population. We propose L5I as a new spino-pelvic parameter to restore in case of L5-S1 disk disease. These normative values will help to control peri-operatively the adequate lordosis restoration, in the presence of LSV.

**KEYWORDS:**

L5 incidence angle; Lordosis restoration; Lumbosacral transitional vertebrae; Pelvic incidence; Surgical planning

PMID: 26814474

**Lateral posture and upper lumbar disc**

Eur Spine J. 2016 Jan 27.

**Radiological analysis of upper lumbar disc herniation and spinopelvic sagittal alignment.**

Bae J<sup>1</sup>, Lee SH<sup>1</sup>, Shin SH<sup>1</sup>, Seo JS<sup>1</sup>, Kim KH<sup>2</sup>, Jang JS<sup>3</sup>.

Abstract

**PURPOSE:**

A retrospective cross-sectional study was designed to explore the role of spinopelvic sagittal alignment in upper lumbar disc herniation (ULD) development.

**METHODS:**

A total of 207 consecutive patients who underwent surgery for single-level lumbar disc herniation [24 with ULD and 183 with lower lumbar disc herniation (LLD)] and 40 asymptomatic volunteers were enrolled. Full-length radiographs of the spine were taken to evaluate pelvic incidence (PI), sacral slope (SS), pelvic tilt (PT), thoracic kyphosis (TK), lumbar lordosis (LL), and sagittal vertical axis (SVA). The Roussouly classification was utilized to categorize all subjects according to their sagittal alignment. Spinopelvic parameters and Roussouly classification results were compared between groups.

**RESULTS:**

There were significant differences in PI, SS, PT, LL, and SVA between the ULD, LLD, and control groups. PI in the ULD (40.9°) was significantly lower than in the LLD and control groups (48.8° and 47.6°, respectively). LL was significantly lower in the ULD than in the LLD (-32.4° and -40°, respectively). There were significant differences between the three groups in Roussouly types. The LLD had a significantly higher proportion (62.6 %) of type 2 lordosis (flat back), and the ULD had a higher proportion (33.3 %) of type 1 lordosis than the other groups.

**CONCLUSIONS:**

This study demonstrated the importance of PI and lumbar curvature in the pathogenesis of ULD. The higher prevalence of short LL and long TK with low PI in the ULD group implies that an increased mechanical stress at this level may be one of the risk factors of ULD.

**KEYWORDS:**

Lumbar lordosis; Pelvic incidence; Sagittal balance; Spinopelvic parameter; Upper lumbar disc herniation

PMID:26818031

**59. PAIN****Parasympathetic function and pain****The relationships between parasympathetic function and pain perception: the role of anxiety**

Pain Practice, 02/17/2016 NahmanAverbuch H, et al. –

The authors examined the effect of anxiety level on parasympathetic function and pain perception as well as on the relationships between these 2 systems. This study demonstrates the role of anxiety level on the relationships between parasympathetic function and pain perception. They suggest that a situation of high anxiety leads to higher norepinephrine levels that can influence both parasympathetic function and pain perception, thus explaining the significant relationships found between these 2 systems only in subjects with high anxiety.

**Methods**

- Thirty healthy females were divided into high- and low-anxiety groups according to their trait anxiety levels.
- Parasympathetic function was obtained using heart rate variability, deep breathing, and Valsalva ratios.
- Pain perception parameters of heat pain thresholds, pain rating of supra-thresholds stimulus, mechanical temporal summation, and conditioned pain modulation response were examined.

**Results**

- The low-anxiety and high-anxiety groups exhibited no significant differences in the parasympathetic function and pain perception parameters.
- Assessment of the associations revealed that in the high-anxiety group, higher mean ratings of the tonic heat pain stimulus were significantly correlated with higher rMSSD ( $r^2 = 0.358$ ,  $P = 0.019$ ), but this was not found for the low-anxiety group ( $P = 0.282$ ).
- In addition, in the high-anxiety group, efficient conditioned pain modulation response was correlated with higher deep breathing ratio ( $r^2 = 0.363$ ,  $P = 0.023$ ); however, in the low-anxiety group, the correlation did not reach significance ( $P = 0.109$ ).

**62 A. NUTRITION/VITAMINS****Grape juice**

Am J Clin Nutr. 2016 Feb 10. pii: ajcn114553.

**Concord grape juice, cognitive function, and driving performance: a 12-wk, placebo-controlled, randomized crossover trial in mothers of preteen children.**

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Abstract

**BACKGROUND:**

Daily consumption of Concord grape juice (CGJ) over 3-4 mo has been shown to improve memory function in adults with mild cognitive impairment and reduce blood pressure in hypertensive adults. These benefits likely result from the high concentration of polyphenols in CGJ. Increased stress can impair cognitive function and elevate blood pressure. Thus, we examined the potential beneficial effect of CGJ in individuals with somewhat stressful and demanding lifestyles.

**OBJECTIVE:**

We sought to examine the effects of the daily consumption of CGJ for 12 wk on cognitive function, driving performance, and blood pressure in healthy, middle-aged working mothers.

**DESIGN:**

Twenty-five healthy mothers (aged 40-50 y) of preteen children who were employed for  $\geq 30$  h/wk consumed 12 ounces (355 mL) of either CGJ (containing 777 mg total polyphenols) or an energy-, taste-, and appearance-matched placebo daily for 12 wk according to a randomized crossover design with a 4-wk washout. Verbal and spatial memory, executive function, attention, blood pressure, and mood were assessed at baseline and at 6 and 12 wk. Immediately after the cognitive battery, a subsample of 17 women completed a driving performance assessment at the University of Leeds Driving Simulator. The 25-min driving task required participants to match the speed and direction of a lead vehicle.

**RESULTS:**

Significant improvements in immediate spatial memory and driving performance were observed after CGJ relative to placebo. There was evidence of an enduring effect of CGJ such that participants who received CGJ in arm 1 maintained better performance in the placebo arm.

**CONCLUSIONS:**

Cognitive benefits associated with the long-term consumption of flavonoid-rich grape juice are not exclusive to adults with mild cognitive impairment. Moreover, these cognitive benefits are apparent in complex everyday tasks such as driving. Effects may persist beyond the cessation of flavonoid consumption, and future studies should carefully consider the length of washout within crossover designs. This trial was registered at clinicaltrials.gov as NCT01411631.

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**KEYWORDS:**

anthocyanins; cognition; cognitive function; driving; flavonoids; grape juice; memory; polyphenols

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**Probiotics**

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**Prebiotics and synbiotics: dietary strategies for improving gut health.**

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Author information

Abstract

***PURPOSE OF REVIEW:***

A wide range of dietary carbohydrates, including prebiotic food ingredients, fermentable fibers, and milk oligosaccharides, are able to produce significant changes in the intestinal microbiota. These shifts in the microbial community are often characterized by increased levels of bifidobacteria and lactobacilli. More recent studies have revealed that species of *Faecalibacterium*, *Akkermansia*, and other less well studied members may also be enriched. We review the implications of these recent studies on future design of prebiotics and synbiotics to promote gastrointestinal health.

***RECENT FINDINGS:***

Investigations assessing the clinical outcomes associated with dietary modification of the gut microbiota have shown systemic as well as specific health benefits. Both prebiotic oligosaccharides comprised of a linear arrangement of simple sugars, as well as fiber-rich foods containing complex carbohydrates, have been used in these trials. However, individual variability and nonresponding study participants can make the outcome of dietary interventions less predictable. In contrast, synergistic synbiotics containing prebiotics that specifically stimulate a cognate probiotic provide additional options for personalized gut therapies.

***SUMMARY:***

This review describes recent research on how prebiotics and fermentable fibers can influence the gut microbiota and result in improvements to human health.

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