

1. LUMBAR SPINE

Ligament calcification

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Obesity and calcification of the ligaments of the spine: a comprehensive CT analysis of the entire spine in a random trauma population.

Chaput CD1, Siddiqui M2, Rahm MD3.

BACKGROUND CONTEXT: Obesity, which is currently surging to epidemic levels within the United States, has been linked to hyperostotic conditions like diffuse idiopathic skeletal hyperostosis (DISH) and ossification of the posterior longitudinal ligament (OPLL). Excess adipose tissue and insulin-resistance may cause a systemic increase in serum levels of proinflammatory cytokines and these signals can affect bone metabolism. Spinal ligaments and discs may have receptors for these signaling molecules. Anecdotal observations at this institution suggested that there is a clinically important subset of younger patients with obesity and multilevel stenosis in the presence of unusual calcification of the spinal ligaments that is distinct from DISH.

PURPOSE: To determine if there is an association between truncal obesity and calcifications of the spine in nonelderly adults.

STUDY DESIGN/SETTING: This is a retrospective analysis of 214 sequential trauma patients between the ages of 29 and 50. Patients' age, sex, truncal obesity, history of hypertension, and diabetes were assessed for association with ligamentous calcification of the spine.

PATIENT SAMPLE: Sequential trauma patients were chosen from our institution's trauma database between 2006 and 2007.

METHODS: Full spine computed tomography (CT) imaging was examined for bone formation in the region of the anterior longitudinal ligament (ALL) and annulus, posterior longitudinal ligament (PLL) and annulus, and the ligamentum flavum (LF). Visceral and subcutaneous abdominal fat were also evaluated. The authors report no study funding sources or conflicts of interest.

OUTCOME MEASURES: Calcification of the ALL, PLL, and LF were assigned a score at each level and then combined for a total calcification score (TCS) for the entire spine. Obesity was estimated using a truncal body mass index (TBMI) by using a previously validated CT derived truncal total adiposity volume (TAV).

RESULTS: ALL calcification was associated with age, male gender, hypertension, and increased adiposity. PLL calcification was significantly associated with age and hypertension. LF calcification was only associated with increased obesity.

CONCLUSIONS:

In our analysis of nonelderly patients, LF calcification was independently associated with truncal obesity. This implies obesity plays a greater role in calcification than could be accounted for by simply age-related degeneration or gender.

2. LBP

Central sensitization and LBP

Are Signs of Central Sensitization in Acute Low Back Pain a Precursor to Poor Outcome?

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DOI: <https://doi.org/10.1016/j.jpain.2019.03.001>

Highlights

- Central sensitization presents in some but not all individuals with acute back pain.
- Presence of central sensitization early does not necessarily precede poor outcome.
- Early sensitization precedes poor outcome when combined with psychological factors.

Abstract

Central sensitization is considered to have a pathophysiological role in chronic low back pain (LBP). Whether individuals with increased central sensitization early in their condition are more likely to develop persistent pain or whether it increases over time is unclear. This study aimed to determine whether sensory profiles during acute LBP differ between individuals who did and did not recover by 6 months and to identify subgroups associated with outcomes. Individuals with acute LBP (<2 weeks of onset; N = 99) underwent pain threshold (heat/cold/pressure) and conditioned pain modulation testing after completing questionnaires related to pain/disability, sleep, and psychological status. Sensory measures were compared during the acute phase (baseline) and longitudinally (baseline/6 months) between unrecovered (greater or unchanged pain and disability), partially recovered (improved but not recovered pain and/or disability), and recovered (no pain and disability) participants at 6 months. We assessed baseline patterns of sensory sensitivity alone, and with psychological and sleep data, using hierarchical clustering and related the clusters to outcome (pain/disability) at 3 and 6 months. No sensory measure at either time point differed between groups. Two subgroups were identified that associated with more (“high sensitivity”) or less (“high sensitivity and negative psychological state”) recovery. These data seem to suggest that central sensitization during the acute phase resolves for many patients, but is a precursor to the transition to chronicity when combined with other psychological features.

Perspective

Central sensitization signs during early acute LBP does not necessarily precede poor outcome, but may be sustained in conjunction with other psychological factors and facilitate pain persistence.

Fear avoidance

June 2019 Volume 41, Pages 49–54

Longitudinal associations of kinematics and fear-avoidance beliefs with disability, work ability and pain intensity in persons with low back painAnne Lovise Nordstoga^{a,*} Ingebrigt Meisingset^{a,d} Ottar Vasseljen^a Tom I.L. Nilsen^{a,b},
Monica Unsgaard-Tøndel^{a,c,d}DOI: <https://doi.org/10.1016/j.msksp.2019.03.008>**Highlights**

- Increased range-of-motion weakly associated with reduced disability in low back pain.
- No association between spinal velocity and disability, work ability or pain.
- Fear-avoidance belief is weakly related to velocity at start of a spinal flexion.

Abstract**Background**

Impaired lumbar movement has cross-sectionally been associated with low back pain (LBP); however, the consequence of impaired movement on disability and pain in persons with LBP is poorly understood. Furthermore, fear-avoidance beliefs (FAB) may influence spinal movement, but the relation between fear-avoidance and kinematics is unclear.

Objectives

To investigate the longitudinal associations of kinematics and FAB with disability, work ability and pain in patients with LBP. Further, to explore associations between FAB and kinematics.

Design

Prospective observational study.

Method

Kinematic measures were performed on 44 persons with LBP at baseline, three and nine months. Motion sensors identified range-of-motion and velocity during a spinal flexion/extension. FAB, disability, work ability and pain were reported at all time points using questionnaires.

Results

Increased range-of-motion was weakly associated with less disability (−0.14 points, 95% CI −0.22 to −0.06). Velocity was not associated with disability, work ability or pain. Higher FAB of physical activity were associated with more disability (1.50 points, 95% CI 0.51 to 2.49) and pain (0.37 points, 95% CI 0.11 to 0.62). Higher work-related FAB was associated with lower work ability (−0.37 points, 95% CI −0.68 to −0.05). Moreover, higher FAB showed weak associations with lower velocity in the initial movement phase (−3.3°/s, 95% CI −6.1 to −0.5).

Conclusions

Of the kinematic measures, only range-of-motion was related to disability. Higher FAB was weakly associated with all self-reported outcomes and with lower velocity only at the initial flexion phase. However, the magnitude of these associations suggest marginal clinical importance.

Clinical reasoning

June 2019 Volume 41, Pages 6–14

Aspects influencing clinical reasoning and decision-making when matching treatment to patients with low back pain in primary healthcareBirgitta Widerström^{a,b,*}, Eva Rasmussen-Barr^a, Carina Boström^{a,c}DOI: <https://doi.org/10.1016/j.msksp.2019.02.003>**Highlights**

- Aspects influencing decisions for physiotherapy in LBP were explored and described.
- Specific patient characteristics and assessment findings guided treatment decisions.
- Physiotherapists' personal convictions and constraints influenced treatment selection.
- External factors of workplace approach and priorities affect the offered treatment.

Abstract**Background**

It is unclear how physiotherapists match treatment to patients with low-back pain (LBP) in primary healthcare. A further exploration of physiotherapists' perspective of matching treatments to the individual patient in this setting is needed.

Objective

The aim of this study was to explore and describe aspects influencing physiotherapists' clinical reasoning in the decision-making on individualized treatment of LBP in primary healthcare.

Design

This was an explorative study using qualitative content analysis.

Method

Fifteen semi-structured individual interviews were conducted with physiotherapists, men and women, experienced and novice, working in primary healthcare settings in one sparsely populated region and in one larger city in Sweden.

Findings

Two overarching themes were identified influencing decision-making for individualized treatment of LBP: 1) *Matching requires differentiation and adaptation*, with categories describing specific patient characteristics, assessment findings and treatment adaptations (*classification of pain and bodily findings; patient physical capacity and emotions; patient awareness and motivation; treatment combinations and atypical treatment rationales*); and 2) *The tension between trust and barriers*; with categories describing aspects of physiotherapists' convictions, constraints and working environment (*confidence in treatments and oneself; physiotherapists' terms overrule patients' preferences; personal constraints and workplace approach and priorities*).

Conclusion

This study describes aspects of the patients, the physiotherapists and their workplaces that influence decisions for individualized treatment of LBP. The findings underpin the need for clinician self-reflection, initiatives for skilled clinical competence and the weight clinician observations carry on the complex treatment selection process which need to be appreciated when implementing evidence-based recommendations in clinical practice.

LBP and knee pain

Arthritis Res Ther. 2019 Apr 15;21(1):98. doi: 10.1186/s13075-019-1884-0.

Low back pain precedes the development of new knee pain in the elderly population; a novel predictive score from a longitudinal cohort study.

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Collaborators (7)

BACKGROUND:

To investigate the association between knee pain and risk factors including low back pain and to develop a score to predict new knee pain in an older population, using population-based longitudinal cohort data.

METHODS:

We collected a questionnaire on self-reported knee pain and demographic data in a systematic manner from community residents aged ≥ 50 years twice, at baseline, and after 5 years. Multivariate logistic regression analyses were performed to investigate the association between knee pain and risk factors and to build a predictive model that would enable calculation of the risk of the development of knee pain within 5 years. The model is presented in the form of score charts.

RESULTS:

A total of 5932 residents aged ≥ 50 years from the cohort of 9764 that completed the first questionnaire were enrolled in the second survey. After exclusions, paired data for the two time points an average of 5.4 years apart were analyzed for 4638 participants. Multivariate analyses showed older age, female sex, higher BMI, weight increase, lower mental health score, and higher back pain/disability score were independent risk factors for knee pain. The predictive score comprised six factors: age, sex, BMI, weight increase, mental health, and low back pain/disability. The risk of developing knee pain ranged from 11.0 to 63.2% depending on the total score.

CONCLUSION:

This study demonstrated a significant association between knee and low back pain/disability along with other risk factors. The score we developed can be used to identify a population without any imaging modality who are at high risk of developing knee pain.

3. DISC

Herniation and microphages

Spine (Phila Pa 1976). 2019 May 1;44(9):E520-E529. doi: 10.1097/BRS.0000000000002953.

Secreted Factors From Intervertebral Disc Cells and Infiltrating Macrophages Promote Degenerated Intervertebral Disc Catabolism.

Yang H¹, Liu B, Liu Y, He D, Xing Y, An Y, Tian W.

STUDY DESIGN:

Rat nucleus pulposus (NP) cells or annulus fibrosus (AF) cells were stimulated with conditioned media of RAW 264.7 macrophages and vice versa under healthy culture conditions and in the presence of pro-inflammatory mediators. The gene expression of pro-inflammatory mediators, extracellular matrix (ECM)-modifying enzymes, and chemokines, which play important roles in intervertebral disc degeneration (IDD), was determined.

OBJECTIVE:

To test whether the interaction between native disc cells and infiltrating macrophages accelerates inflammation state, disrupts matrix homeostasis, and promotes inflammatory cells infiltration.

SUMMARY OF BACKGROUND DATA:

With macrophages infiltration, the disc resident cells would be inevitably exposed to macrophages. Macrophages have been shown to play pro-inflammatory role in the cellular interactions with disc cells under healthy culture conditions. However, the biologic interactions between macrophages and disc cells under degenerated disc inflammatory environment remain unknown.

METHODS:

Murine Macrophages RAW 264.7 were cultured in the conditioned media of Rat AF or NP cells culture in the presence or absence of IL-1 β stimulation. Similarly, Rat AF or NP cells were also cultured in the conditioned media of Murine Macrophages RAW 264.7 culture in the presence or absence of IFN- γ stimulation. The mRNA levels difference of pro-inflammatory genes, catabolic genes and chemokines genes for AF cells, NP cells and Macrophages RAW 264.7 were analyzed by qRT-PCR, respectively.

RESULTS:

Compared with serum-free media exposure, RAW 264.7 macrophages exposed to AF or NP cells conditioned media selectively modestly upregulated mRNA levels of the aforementioned cytokines. Exposure of RAW 264.7 macrophages to conditioned media from AF or NP cells with IL-1 β stimulation dramatically increased mRNA levels of all the investigated cytokines. Similarly, compared with serum-free media exposure, AF or NP cells exposed to RAW 264.7 macrophages conditioned media selectively modestly upregulated mRNA levels of the aforementioned cytokines. Exposure of AF or NP cells to conditioned media from RAW 264.7 macrophages with IFN- γ stimulation dramatically increased mRNA levels of all the investigated cytokines.

CONCLUSION:

The biologic interactions between infiltrating macrophages and native disc cells under degenerated disc inflammatory environment lead to an increasingly severe inflammatory conditions, which may be a self-stimulated process from the macrophages infiltration occurrenceLevel of Evidence: 5.

5. SPINAL SURGERY

Importance of Vit. D

Vitamin D hypovitaminosis and efficacy of supplementation in spine surgery patients

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Background: Although there is evidence that hypovitaminosis D is present in many otherwise healthy adults, there is little information on supplementation in patients undergoing spine surgery. Thus, the purpose of this study was to determine the prevalence of preoperative hypovitaminosis D in spine surgery patients and evaluate the efficacy of postoperative vitamin D supplement regimens.

Methods: Per standard of care, serum 25-hydroxyvitamin D levels were regularly drawn preoperatively and at 6 mo postoperatively; patients with hypovitaminosis D were prescribed a 3-month supplementation regimen based on their level of deficiency: 2000 IU/day, 50,000 IU/wk, or both 50,000 IU/wk and 2000 IU/day. For this analysis, we retrospectively reviewed charts of patients who had spine surgery to identify those with preoperative vitamin D levels. Rates of hypovitaminosis D were compared before and after treatment with supplementation.

Results: Of 853 patients with preoperative serum vitamin D levels, 505 (59.2%) had hypovitaminosis D (<30 ng/mL). The rate of insufficiency (20-29 ng/mL) was 31.5%, and the rate of deficiency was 27.7%. At 6 mo postoperatively, the mean serum vitamin D level of patients with hypovitaminosis D increased from 19.7 ng/mL to 30.0 ng/mL ($P<0.001$). However, only 42.6% of patients achieved sufficiency at 6 mo. There were no differences in improvements between the supplementation regimens.

Conclusions: Hypovitaminosis D is common among patients undergoing spine surgery. Patients should be tested preoperatively and prescribed a supplementation for at least 3 mo postoperatively. Serum levels should be checked regularly postoperatively, especially in deficient patients, to determine if further treatment is needed.

7. PELVIC ORGANS/WOMAN'S HEALTH

Hot flashes treatments

Menopause. 2019 Apr;26(4):350-356. doi: 10.1097/GME.0000000000001255.

A pooled analysis of three studies of nonpharmacological interventions for menopausal hot flashes.

Avis NE¹, Levine BJ¹, Danhauer S¹, Coeytaux RR².

OBJECTIVE:

The aim of the study was to conduct a pooled analysis of three published trials of nonpharmacological interventions for menopausal hot flashes to compare the effectiveness of interventions.

METHODS:

Data from three randomized controlled trials of interventions for hot flashes (two acupuncture trials, one yoga trial) were pooled. All three studies recruited perimenopausal or postmenopausal women experiencing ≥ 4 hot flashes/d on average. The primary outcome for all three studies was frequency of hot flashes as measured by the Daily Diary of Hot Flashes. Study 1 participants were randomly assigned to 8 weeks of acupuncture treatments (active intervention), sham acupuncture (attention control), or usual care. Study 2 participants were randomly assigned to 10 weeks of yoga classes, health and wellness education classes (attention control), or waitlist control. Study 3 randomly assigned participants to 6 months of acupuncture or waitlist control. To standardize the time frame for these analyses, only the first 8 weeks of intervention from all three studies were used.

RESULTS:

The three active interventions and the two attention control groups had statistically similar trends in the percentage reduction of hot flashes over 8 weeks, ranging from 35% to 40%. These five groups did not differ significantly from each other, but all showed significantly greater reduction in hot flash frequency compared with the three usual care/waitlist groups.

CONCLUSION:

Acupuncture, yoga, and health and wellness education classes all demonstrated statistically similar effectiveness in reduction of hot flash frequency compared with controls.

Diet and menopause

Menopause. 2019 Apr;26(4):365-372. doi: 10.1097/GME.0000000000001245.

Dietary patterns and their association with menopausal symptoms: a cross-sectional study.

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Author information

Abstract

OBJECTIVE:

Although menopause is a natural event in a woman's life, some of its symptoms can be severe enough to adversely affect her health. There is some evidence to suggest that diet has an influence on menopausal symptoms, but less attention has been paid to dietary patterns. The purpose of this study is to determine the association of dietary patterns with physical, mental, and genitourinary menopausal symptoms.

METHODS:

A cross-sectional study design was applied using a sample of 400 postmenopausal women who attended health centers in the south of Tehran, Iran. The menopausal symptoms were assessed by a Menopause Rating Scale (MRS) questionnaire; a 147-item, semi-quantitative food-frequency questionnaire was used to collect dietary information, and major dietary patterns were identified by principal component analysis. Linear regression was used to evaluate the relationship between menopausal symptoms and dietary patterns.

RESULTS:

Three major dietary patterns were identified: vegetables and fruits (VF); mayonnaise, liquid oils, sweets, and desserts (MLSD); and solid fats and snacks (SFS). It has been found that the VF dietary pattern is inversely associated with general ($\beta=-1.37$; SE=1.08; P for trend <0.001), physical ($\beta=-1.54$; SE=1.09; P for trend <0.001), and mental ($\beta=-1.58$; SE=1.11; P for trend <0.001) symptoms. A stronger adherence to the MLSD dietary pattern was directly associated with general ($\beta=1.15$; SE=1.08; P for trend <0.001) and genitourinary symptoms ($\beta=1.54$; SE=1.1; P for trend <0.001). Moreover, the SFS dietary pattern was directly related to the general ($\beta=1.23$; SE=1.09; P for trend=0.01), physical ($\beta=1.24$; SE=1.09; P for trend=0.04), and mental ($\beta=1.29$; SE=1.12; P for trend <0.001) symptoms.

CONCLUSION:

The present study demonstrated that there is an inverse association between VF dietary pattern and menopausal symptoms. In contrast, the MLSD and SFS dietary patterns were correlated to an increased risk of these symptoms.

8. VISCERA

Stress and CV disease

Research

Stress related disorders and risk of cardiovascular disease: population based, sibling controlled cohort study

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as: BMJ 2019;365:11255 Huan Song

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4. Paul Lichtenstein, professor², Gudmundur Thorgeirsson, Unnur A Valdimarsdóttir,

Objective To assess the association between stress related disorders and subsequent risk of cardiovascular disease.

Design Population based, sibling controlled cohort study.

Setting Population of Sweden.

Participants 136 637 patients in the Swedish National Patient Register with stress related disorders, including post-traumatic stress disorder (PTSD), acute stress reaction, adjustment disorder, and other stress reactions, from 1987 to 2013; 171 314 unaffected full siblings of these patients; and 1 366 370 matched unexposed people from the general population.

Main outcome measures Primary diagnosis of incident cardiovascular disease—any or specific subtypes (ischaemic heart disease, cerebrovascular disease, emboli/thrombosis, hypertensive diseases, heart failure, arrhythmia/conduction disorder, and fatal cardiovascular disease)—and 16 individual diagnoses of cardiovascular disease. Hazard ratios for cardiovascular disease were derived from Cox models, after controlling for multiple confounders.

Results During up to 27 years of follow-up, the crude incidence rate of any cardiovascular disease was 10.5, 8.4, and 6.9 per 1000 person years among exposed patients, their unaffected full siblings, and the matched unexposed individuals, respectively. In sibling based comparisons, the hazard ratio for any cardiovascular disease was 1.64 (95% confidence interval 1.45 to 1.84), with the highest subtype specific hazard ratio observed for heart failure (6.95, 1.88 to 25.68), during the first year after the diagnosis of any stress related disorder. Beyond one year, the hazard ratios became lower (overall 1.29, 1.24 to 1.34), ranging from 1.12 (1.04 to 1.21) for arrhythmia to 2.02 (1.45 to 2.82) for artery thrombosis/embolus. Stress related disorders were more strongly associated with early onset cardiovascular diseases (hazard ratio 1.40 (1.32 to 1.49) for attained age <50) than later onset ones (1.24 (1.18 to 1.30) for attained age ≥50; P for difference=0.002). Except for fatal cardiovascular diseases, these associations were not modified by the presence of psychiatric comorbidity. Analyses within the population matched cohort yielded similar results (hazard ratio 1.71 (1.59 to 1.83) for any cardiovascular disease during the first year of follow-up and 1.36 (1.33 to 1.39) thereafter).

Conclusion Stress related disorders are robustly associated with multiple types of cardiovascular disease, independently of familial background, history of somatic/psychiatric diseases, and psychiatric comorbidity.

12 B. CERVICAL SURGERIES

Ant. Approach best for disc replacement

Spine (Phila Pa 1976). 2019 May 1;44(9):615-623. doi: 10.1097/BRS.0000000000002912.

Anterior and Posterior Approaches for Cervical Myelopathy: Clinical and Radiographic Outcomes.

Hitchon PW¹, Woodroffe RW, Noeller JA, Helland L, Hramakova N, Nourski KV.

STUDY DESIGN:

A retrospective cohort study.

OBJECTIVE:

The aim of this study was to identify advantages and disadvantages of the anterior and posterior approaches in the treatment of cervical stenosis and myelopathy.

SUMMARY OF BACKGROUND DATA:

Both anterior and posterior surgical approaches for cervical stenosis and myelopathy have been shown to result in improvement in health-related outcomes. Despite the evidence, controversy remains regarding the best approach to achieve decompression and correct deformity.

METHODS:

We retrospectively reviewed patients with cervical stenosis and myelopathy who had undergone anterior cervical fusion and instrumentation (n=38) or posterior cervical laminectomy and instrumentation (n=51) with at least 6 months of follow-up. Plain radiographs, magnetic resonance imaging, and computed tomography scans, as well as health-related outcomes, including Visual Analog Scale for neck pain, Japanese Orthopedic Association score for myelopathy, Neck Disability Index, and Short Form-36 Health Survey, were collated before surgery and at follow-up (median 12.0 and 12.1 months for anterior and posterior group, respectively).

RESULTS:

Both anterior and posterior approaches were associated with significant improvements in all studied quality of life parameters with the exception of general health in the anterior group and energy and fatigue in the posterior group. In the anterior group, follow-up assessment revealed a significant increase in C2-7 lordosis. Both approaches were accompanied by significant increases in C2-7 sagittal balance [sagittal vertical axis (SVA)]. There were two complications in the anterior group and nine complications in the posterior group; the incidence of complications between the two groups was not significantly different.

CONCLUSION:

When the benefits of one approach over the other are not self-evident, the anterior approach is recommended, as it was associated with a shorter hospital stay and more successful restoration of cervical lordosis than posterior surgery.

13 B. TMJ/ORAL**Condylar size**

Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology

Changes in condylar dimensions in temporomandibular joints with disc displacement

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ABSTRACT**Objectives**

To investigate the condylar dimensions of the temporomandibular joint (TMJ) with respect to disc displacements and gender using computed tomography (CT) and magnetic resonance imaging (MRI).

Study Design

Disc displacements were divided into three groups based on MRI: normal disc position (NR), disc displacement with reduction (DDR), and disc displacement without reduction (DDNR). After the angular and linear condylar dimensions were calculated from CT images, differences in condylar dimensions with respect to disc displacements and gender were analyzed with two-way analysis of variance.

Results

Condylar depth and condylar height were significantly smaller in condyles with DDNR than those with NR or DDR (NR = DDR > DDNR). Condylar width gradually decreased significantly from NR to DDNR (NR > DDR > DDNR). The anterior condylar angle was significantly larger in condyles with NR than those with DDR or DDNR (NR > DDR = DDNR). Condyles with DDNR exhibited significantly larger horizontal condylar angles than those with NR or DDR (NR = DDR < DDNR). Altered condylar dimensions associated with disc displacement were not significantly different between men and women.

Conclusion

Condylar dimensions may be significantly associated with disc displacements of the TMJ, irrespective of gender.

13 D. SLEEP**Sleeping disorders and ischemic stroke**

Stroke. 2019 Mar;50(3):571-576. doi: 10.1161/STROKEAHA.118.023807.

Sleep-Disordered Breathing Is Associated With Recurrent Ischemic Stroke.

Brown DL1, Shafie-Khorassani F2, Kim S2, Chervin RD3, Case E1,4, Morgenstern LB1,4, Yadollahi A5,6, Tower S7, Lisabeth LD1,4.

Background and Purpose- Limited data are available about the relationship between sleep-disordered breathing (SDB) and recurrent stroke and mortality, especially from population-based studies, large samples, or ethnically diverse populations.

Methods- In the BASIC project (Brain Attack Surveillance in Corpus Christ), we identified patients with ischemic stroke (2010-2015). Subjects were offered screening for SDB with the ApneaLink Plus device, from which a respiratory event index (REI) score ≥ 10 defined SDB. Demographics and baseline characteristics were determined from chart review and interview. Recurrent ischemic stroke was identified through active and passive surveillance. Cause-specific

proportional hazards models were used to assess the association between REI (modeled linearly) and ischemic stroke recurrence (as the event of interest), and all-cause poststroke mortality, adjusted for multiple potential confounders.

Results- Among 842 subjects, the median age was 65 (interquartile range, 57-76), 47% were female, and 58% were Mexican American. The median REI score was 14 (interquartile range, 6-26); 63% had SDB. SDB was associated with male sex, Mexican American ethnicity, being insured, nonsmoking status, diabetes mellitus, hypertension, lower educational attainment, and higher body mass index. Among Mexican American and non-Hispanic whites, 85 (11%) ischemic recurrent strokes and 104 (13%) deaths occurred, with a median follow-up time of 591 days. In fully adjusted models, REI was associated with recurrent ischemic stroke (hazard ratio, 1.02 [hazard ratio for one-unit higher REI score, 95% CI, 1.01-1.03]), but not with mortality alone (hazard ratio, 1.00 [95% CI, 0.99-1.02]).

Conclusions- Results from this large population-based study show that SDB is associated with recurrent ischemic stroke, but not mortality. SDB may therefore represent an important modifiable risk factor for poor stroke outcomes.

Insomnia and depression**Link between insomnia and perinatal depressive symptoms: A meta-analysis**

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<https://doi.org/10.1111/jsr.12858>

Evidence shows the possible link between insomnia and perinatal depressive symptoms.

In order to find a convergent quantitative answer, we collected data via the search of Medline, EMBASE and reference tracking, which included nine studies (a total sample of 1,922 women). An aggregate effect size estimate (correlation coefficient) was generated using the comprehensive meta-analysis software. For the meta-analytic procedure, a random effects model was set *a priori*. Moderating factors, including study design, method of assessment of depression, geographical origin of data, publication year, mean age, % married, breastfeeding rate, quality and type of data, % primiparous and history of depression, were examined via categorical or univariate mixed-effects (method of moments) meta-regression methods. Heterogeneity and publication bias were examined using standard meta-analytic approaches. We found a significant, medium-size relationship between insomnia and perinatal depressive symptoms (point estimate, 0.366; 95% confidence interval [CI], 0.205–0.508; $p < 0.001$; $n = 9$) and this was significantly heterogeneous (Q , 118.77; df , 8; $p < 0.001$; I^2 , 93.26%). The effect size estimate was significant for studies reporting no history of depression (point estimate, 0.364; 95% CI, 0.035–0.622; $p < 0.05$; $n = 5$) and for study design. With meta-regression, no moderating factor (age, marriage rate, breastfeeding rate, pregnancy history or publication year) significantly mediated the effect size estimate.

The depression assessment scale used, but not other categorical variables, explained the magnitude of heterogeneity. We found that insomnia during the perinatal period is associated with depressive symptoms, which warrants screening pregnant mothers for insomnia and depression.

14. HEADACHES

HA and fibromyalgia

BMJ Open. 2019 Apr 8;9(4):e026581. doi: 10.1136/bmjopen-2018-026581.

Bidirectional association between migraine and fibromyalgia: retrospective cohort analyses of twopopulations.

Penn IW^{1,2}, Chuang E³, Chuang TY⁴, Lin CL⁵, Kao CH^{6,7,8}.

OBJECTIVE: Fibromyalgia (FM) and migraine are common pain disorders that tend to coexist. This study determined whether these two conditions exhibited any mutual influences.

SETTING: Cohort study.

PARTICIPANTS: A retrospective, longitudinal cohort study was conducted using data obtained from a nationwide healthcare database. This study had two arms. Arm 1 comprised 33 216 patients with FM and arm 2 consisted of 7420 patients with migraine; all of these patients were diagnosed between 2000 and 2010. Using the aforementioned database, control subjects who had neither FM nor migraine and were matched with the FM and migraine patients by sex, age and index date of diagnosis were recruited. Each control cohort was four times the size of the corresponding study cohort. Follow-up for the control and study cohorts was conducted until the end of 2011.

RESULTS: The incidence rates of FM and migraine were calculated in arms 1 and 2, respectively. The overall incidence of migraine was greater in the FM cohort than in the corresponding control cohort (4.39 vs 2.07 per 1000 person-years (PY)); crude HR=2.12, 95% CI=1.96 to 2.30; adjusted HR (aHR)=1.89, 95% CI=1.75 to 2.05). After adjustment for sex, age and comorbidities, the overall incidence of FM in the migraine cohort was 1.57 times greater than that in the corresponding control cohort (7.01 vs 4.49 per 1000 PY; aHR=1.52, 95% CI=1.39 to 1.65).

CONCLUSIONS:

The present study revealed a bidirectional link between FM and migraine.

Migraine and vertigo**Migraine and episodic Vertigo: a cohort survey study of their relationship**

- Christian Lampl Alan Rapoport, Moris Levin and Elisabeth Bräutigam

Headache"2019**20**:33

<https://doi.org/10.1186/s10194-019-0991-2>

Background and aim

Migraine headache and vestibular-type vertigo co-occur in the general population about three times more often than expected by chance. Attacks of episodic vertigo (eV) are currently not recognized as migraine equivalents or variants in the International Classification of Headache Disorders, 3rd edition (ICHD III). No strong data exist about the prevalence of eV during the phases of a migraine attack. The aim of this study is to analyze the timing association between migraine-related episodic vertigo and the phases of migraine.

Methods

The “Migraine and Neck Pain Study” gathered data from nearly 500 adult participants in a questionnaire-based survey. In this prospective, follow-up study we re-analyzed patients with episodic migraine with and without aura who experienced eV anytime around their migraine attacks. For this we defined 3 different time periods.

Results

146/487 (30%) reported eV anytime during the migraine attack; 79/487 (16%) that noticed eV with the start of the headache, 51/487 (10%) within 2 h before the headache and 16/487 (3%) experienced eV 2–48 h before the headache, as a premonitory symptom. 130/487 (26.7%) of our patients can be diagnosed with vestibular or probable vestibular migraine supporting the clinical association of migraine and vertigo.

Conclusions

Our results seem to further support the concept that vertigo in migraine is best thought of as an integral manifestation of migraine, rather than a prodromal or aura symptom.

Risk of ischaemic stroke and migraines**Risk of ischaemic stroke in patients with migraine: A longitudinal follow-up study using a national sample cohort in South Korea**

BMJ Open — Lee SY, et al. | April 04, 2019

In this study involving migraineurs, researchers studied the risks of different types of stroke. They gathered data from a national cohort between 2002 and 2013 by the South Korea Health Insurance Review and Assessment. Data were extracted from migraine patients (n=41,585) and 1:4 matched controls (n=166,340), which they used to analyze the occurrence of ischemic and hemorrhagic strokes. In the migraine group, they observed higher rates of ischemic stroke vs the control group. The adjusted HR for ischemic stroke was 1.18 in the migraine group. In middle-aged women and older women, the contribution of migraine to the occurrence of ischemic stroke was also observed. Overall, the investigators concluded that migraine was not associated with hemorrhagic stroke but was instead linked to an increased risk of ischemic stroke.

20 A. ROTATOR CUFF**Instabilities**

J Shoulder Elbow Surg. 2019 Apr 16. pii: S1058-2746(19)30140-5. doi: 10.1016/j.jse.2019.02.020.

Sex-related differences in patients undergoing surgery for shoulder instability: a Multicenter Orthopaedic Outcomes Network (MOON) Shoulder Instability cohort study.

Magnuson JA1, Wolf BR2, Cronin KJ3, Jacobs CA3, Ortiz SF2, Bishop JY4, Baumgarten KM5; MOON Shoulder Group, Hettrich CM3.

HYPOTHESIS AND BACKGROUND:

Male sex has been identified as a risk factor for both primary shoulder dislocation and recurrent instability, and male patients more often undergo surgery for instability. Despite published discrepancies between sexes regarding the incidence and surgical rates of shoulder instability,

METHODS:

Prospective baseline data from 1010 patients in the Multicenter Orthopaedic Outcomes Network (MOON) Shoulder Instability cohort were analyzed for sex-related differences using demographic characteristics, patient-reported outcomes, radiographic findings, intraoperative findings, and surgical procedures performed. Two-tailed t tests and χ^2 tests were used to compare the continuous and categorical data, respectively. Patients were categorized using the Frequency, Etiology, Direction, Severity (FEDS) classification system.

RESULTS:

Male patients comprised 81.3% of the cohort. Male patients had a significantly higher rate of traumatic instability and rate of initial instability while playing sports, as well as significantly higher activity scores. Female patients had significantly lower preoperative American Shoulder and Elbow Surgeons, Western Ontario Shoulder Instability Index, 36-Item Health Survey, and Single Assessment Numeric Evaluation scores. No difference in the number of dislocations was found between male and female patients. Intraoperatively, male patients had higher rates of labral pathology and bone loss whereas female patients had higher rates of capsular laxity. These differences resulted in more Latarjet procedures for male patients and more soft-tissue procedures for female patients.

CONCLUSION:

There are differences between male and female patients in the etiology of their instability, baseline patient-reported outcomes, and associated shoulder pathology, likely reflecting intrinsic and activity-related variation. These differences may influence clinical decision making and patient outcomes.

28. HIP REPLACEMENTS**Stem type failures****High Failure at a Minimum 5-Year Follow-Up in Primary Total Hip Arthroplasty Using a Modular Femoral Trunnion**

Cindy R. Nahhas, BS^a Paul H. Yi, MD^b Mario Moric, MS^a Rajeev Puri, MD^c,
Joshua J. Jacobs, MD^a Scott M. Sporer, MD, MS^{a,*}

DOI: <https://doi.org/10.1016/j.arth.2019.03.033>

Background

Modular femoral trunnions enable the surgeon to independently adjust offset, leg length, and anteversion in total hip arthroplasty (THA). However, modularity may result in an increased risk of fretting and corrosion along with a higher risk of implant dissociation or fracture. The purpose of this study is to evaluate mid-term survivorship of THAs using a cementless modular system.

Methods

A consecutive series of 221 patients who underwent a primary THA using the ALFA II modular stem by a single surgeon between 2002 and 2004 were reviewed. Survivorship of the ALFA II modular hip system was evaluated at a minimum of 5 years postoperatively.

Results

Of the 221 patients, 28 (12.7%) died from causes unrelated to the surgery before adequate follow-up, and 64 (29.0%) patients were lost to follow-up. The remaining 129 patients had a mean 6.5-year (range: 5-8 years) follow-up. All-cause survivorship of the modular stem system was 81% (95% confidence interval = 69-90) at a mean 6.5-year follow-up. Of the 25 (19.4%) cases requiring revision surgery, 52.0% was for dissociation of the modular components, 32.0% was for fracture of the prosthesis, 12.0% was for instability/multiple dislocations, and 4.0% was for chronic septic THA. Body mass index (odds ratio = 1.080) and offset (odds ratio = 1.254) were independent risk factors for mechanical failures of the modular stem system.

Conclusion

The modular stem hip system of interest in this study demonstrates a high failure rate at mid-term follow-up, and we caution against the use of similar designs in primary THAs.

30 A. HIP IMPINGEMENT**Retroversion risk factor**

J Arthroplasty. 2019 Feb 25. pii: S0883-5403(19)30206-2. doi: 10.1016/j.arth.2019.02.050.

Acetabular Retroversion Is a Risk Factor for Less Optimal Outcome After Femoroacetabular Impingement Surgery.

Vahedi H1, Aalirezaie A1, Schlitt PK1, Parvizi J1.

BACKGROUND:

Patients with acetabular retroversion are at risk of labral tear and hip pain. It is unknown whether femoroacetabular osteoplasty (FAO) without reverse periacetabular osteotomy can be used in these patients. This study evaluated the outcome of mini-open FAO in patients with acetabular retroversion and compared that to patients without acetabular retroversion.

METHODS:

Fifty-one patients (29 male, 22 female) with acetabular retroversion who had undergone FAO between 2007 and 2015 were identified. The minimum 2-year clinical and radiological outcome was compared with 550 patients without dysplasia or retroversion who underwent FAO by the same surgeon. The preoperative and postoperative alpha angle, center-edge angle, Tonnis grade, joint space, and presence of labral tear and chondral lesion were determined.

RESULTS:

The mean age in the retroversion cohort was 27.4 ± 9.5 years compared to 34.5 ± 11.2 years in the control. The mean follow-up was 4.8 ± 1.5 years for retroversion and 4.1 ± 1.2 years for the control. The mean preoperative Short-Form 36 Health Survey and modified Harris hip score were not different between the cohorts. At the latest follow-up, the mean modified Harris hip score and Short-Form 36 Health Survey were significantly lower in the retroversion group (75.4 and 76.5) compared to the control (83.4 and 85.6). There was a higher percentage of failure among retroversion patients (13.7%) compared to the control (2.5%).

CONCLUSION:

Acetabular retroversion resulting in femoroacetabular impingement may be treated by FAO, but the outcome appears to be less optimal compared to patients with femoroacetabular impingement and no evidence of dysplasia and acetabular retroversion. Hip preservation surgeons should be aware of this anatomic variation and possible inferior treatment results after FAO in these patients.

[Return to sports](#)

Performance and Return to Sport After Hip Arthroscopy for Femoroacetabular Impingement in Professional Athletes Differs Between Sports

Robert A. Jack II, M.D. Kyle R. Sochacki, M.D. Takashi Hirase, M.D., M.P.H. Justin W. Vickery, B.S. Joshua D. Harris, M.D

DOI: <https://doi.org/10.1016/j.arthro.2018.10.153>

Purpose

To determine (1) return-to-sport rates for National Football League, Major League Baseball, National Basketball Association, and National Hockey League (NHL) athletes after hip arthroscopy for femoroacetabular impingement syndrome, (2) postoperative return-to-sport rate differences between sports, (3) differences in postoperative career length and games per season, (4) differences in preoperative and postoperative performance, and (5) postoperative performance compared with that of matched control players.

Methods

Professional athletes who underwent hip arthroscopy for femoroacetabular impingement syndrome were identified. Matched control players were identified by position, age, experience, and performance. Return to sport was defined as playing in at least 1 game after surgery. Continuous variables for each group were compared by using a 2-tailed paired-samples Student *t* test or χ^2 test. A Bonferroni correction was used to control for multiple comparisons with statistical significance defined by a *P* value < .002.

Results

One hundred seventy-two players (86.4%) (mean age, 28.8 ± 5.2 years) were able to return to sport at an average of 7.1 ± 4.1 months. Athletes played 3.5 ± 2.4 years after surgery without significant differences between sports (*P* > .002). NHL players who underwent surgery played significantly fewer years (4.4 vs 3.3 years) (*P* < .001) and fewer games per season (4 fewer games) (*P* < .001) after surgery compared with control players. NHL players also had a significant decrease in performance after surgery compared with their performance before surgery (*P* < .001). In National Football League, Major League Baseball, and National Basketball Association athletes, no significant differences were found in games per season, career length, or preoperative performance compared with postoperative performance and performance of matched control players (*P* > .002).

Conclusion

The RTS rate for professional athletes after surgery for femoroacetabular impingement syndrome is high. Only NHL athletes had significantly shorter careers and played significantly fewer games per season compared with matched control players, with no difference between sports. NHL athletes had significantly worse postoperative performance compared with preoperative performance, with all other sports demonstrating a career-related decline similar to that of matched control players.

37. OSTEOARTHRITIS/KNEE

Hypermobility not related to OA

Joint hypermobility is not positively associated with prevalent multiple joint osteoarthritis: a cross-sectional study of older adults

- Terese R. Gullo, Yvonne M. Golightly, Portia Flowers, Joanne M. Jordan,
- Jordan B. Renner, Todd A. Schwartz, Virginia B. Kraus, Marian T. Hannan,
- Rebecca J. Cleveland and Amanda E. Nelson
- *BMC Musculoskeletal Disorders*2019**20**:165

<https://doi.org/10.1186/s12891-019-2550-z>

Background

This cross-sectional study evaluated associations of joint hypermobility and multiple joint osteoarthritis (MJOA) in a community-based cohort of adults 45+ years of age.

Methods

MJOA and joint hypermobility data were from 1677 participants (mean age 69 years, 68% women) who completed research clinic visits during 2003–2010. Prevalent MJOA was defined in four ways. Radiographic OA (rOA) was defined as Kellgren-Lawrence (KL) > 2 at any included study joint; symptomatic OA (sxOA) required both symptoms and rOA in a joint. Joint hypermobility was defined as a Beighton score of > 4. Separate logistic regression models were used to estimate odds ratios (OR) between joint hypermobility and each MJOA definition, adjusting for age, sex, race, body mass index, and baseline visit.

Results

In this cohort, 4% had Beighton score > 4 and 63% met any definition of MJOA. Joint hypermobility was associated with significantly lower odds of radiographic and symptomatic MJOA-1 (multiple joint OA-definition 1: involvement of > 1 IP (interphalangeal) nodes and > 2 sites of hip, knee, and spine; 74 and 58% lower, respectively). However, for the other MJOA definitions (i.e., MJOA-2:involvement of > 2 IP joints, > 1 carpometacarpal [CMC] joints, and knee or hip sites; MJOA-3: involvement of > 5 joint sites from among distal interphalangeal, proximal interphalangeal, CMC, hip, knee, or spine sites; and MJOA-4:involvement of > 2 lower body sites (hip, knee, or spine), there were no statistically significant associations. For associations between site-specific hypermobility and any MJOA definition, most adjusted ORs were less than one, but few were statistically significant.

Conclusions

Overall, joint hypermobility was not positively associated with any definition of prevalent MJOA in this cohort, and an inverse association existed with one definition of MJOA. Longitudinal studies are needed to determine the contribution of hypermobility to the incidence and progression of MJOA outcomes.

40. ANKLE SPRAINS AND INSTABILITY

Stiff ankles MRI

Comparison between subtalar joint quantitative kinematic 4-D CT parameters in healthy volunteers and patients with joint stiffness or chronic ankle instability: A preliminary study

Pedro Augusto Gondim Teixeira^a, Anne-Sophie Formery^a, Gwenaël Balazuc^a,
Guillaume Lux^b, Isabelle Loiret^c, Gabriela Hossu^d, Alain Blum^a

DOI: <https://doi.org/10.1016/j.ejrad.2019.03.001>

Highlights

- Quantitative kinematic 4-D CT can be used to evaluate subtalar joint pathology.
- The interobserver reproducibility with this method was considered excellent.
- Effective doses were below 0.1 mSv.
- Patients with subtalar joint stiffness could be differentiated from controls.
- Posterior calcaneal facet uncovering allowed identification of subtalar instability.

Abstract

Objective

to compare quantitative kinematic 4-D CT parameters between healthy volunteers and pathologic patients (joint stiffness or chronic ankle instability).

Methods

Thirteen healthy volunteers without previous ankle trauma, 18 patients with clinical subtalar joint stiffness and 10 patients with chronic ankle instability diagnosed based on clinical and imaging findings were prospectively evaluated with 4-D CT. This study was approved by the local ethics committee and all patients signed an informed consent. The subtalar joint was evaluated during a prono-supination cycle. Two angles and two distances between the talus and the calcaneus were measured semi-automatically and independently by two readers. Measurement variations were compared in these three different groups.

Results

There were statistically significant differences between axial and coronal talocalcaneal angles of healthy volunteers and patients with joint stiffness ($p < 0.0001$). The best sensitivities and specificities for the identification of subtalar joint stiffness were 92–100% and 74–94%. Mean and maximal posterior calcaneal facet uncovering were significantly lower in patients with chronic ankle instability patients compared to healthy volunteers ($p < 0.006$) with sensitivities and specificities of 92–95% and 80–92% respectively.

Conclusion

Quantitative analysis in 4D CT can provide an objective criteria for the differentiation between healthy volunteers and patients with subtalar joint stiffness and chronic ankle instability.

45 A. MANUAL THERAPY LUMBAR & GENERAL**Spinal manip helps parasympathetic function**

Spine (Phila Pa 1976). 2019 May 1;44(9):609-614. doi: 10.1097/BRS.0000000000002908.

Spinal Manipulative Therapy Effects in Autonomic Regulation and Exercise Performance in Recreational Healthy Athletes: A Randomized Controlled Trial.

Valenzuela PL^{1,2}, Pancorbo S³, Lucia A⁴, Germain F¹.

STUDY DESIGN:

A randomized, double blind, parallel groups, sham-controlled trial.

OBJECTIVE:

The aim of this study was to analyze the acute effects of spinal manipulative therapy (SMT) on performance and autonomic modulation.

SUMMARY OF BACKGROUND DATA:

The use of SMT is progressively spreading from the clinical to the sporting context owing to its purported ergogenic effects. However, its effects remain unclear.

METHODS:

Thirty-seven male recreational athletes (aged 37 ± 9 years) who had never received SMT were assigned to a sham (n=19) or actual SMT group (n=18). Study endpoints included autonomic modulation (heart rate variability), handgrip strength, jumping ability, and cycling performance [8-minute time trial (TT)]. Differences in custom effects between interventions were determined using magnitude-based inferences.

RESULTS:

A significant and very likely lower value of a marker of sympathetic modulation, the stress score, was observed in response to actual compared with sham SMT [P=0.007; effect size (ES)=-0.97]. A trend toward a significant and likely lower sympathetic:parasympathetic ratio (P=0.055; ES=-0.96) and a likely higher natural logarithm of the root-mean-square differences of successive heartbeat intervals [(LnRMSSD), P=0.12; ES=0.36] was also found with actual SMT. Moreover, a significantly lower mean power output was observed during the TT with actual compared with sham SMT (P=0.035; ES=-0.28). Nonsignificant (P>0.05) and unclear or likely trivial differences (ES<0.2) were found for the rest of endpoints, including handgrip strength, heart rate during the TT, and jump loss thereafter.

CONCLUSION:

A single pre-exercise SMT session induced an acute shift toward parasympathetic dominance and slightly impaired performance in recreational healthy athletes.

Chiropractic improves quality of life

Spine (Phila Pa 1976). 2019 May 1;44(9):647-651. doi: 10.1097/BRS.0000000000002902.

Group and Individual-level Change on Health-related Quality of Life in Chiropractic Patients With Chronic Low Back or Neck Pain.

Hays RD¹, Spritzer KL¹, Sherbourne CD², Ryan GW², Coulter ID³.

STUDY DESIGN:

A prospective observational study.

OBJECTIVE:

The aim of this study was to evaluate group-level and individual-level change in health-related quality of life among persons with chronic low back pain or neck pain receiving chiropractic care in the United States.

SUMMARY OF BACKGROUND DATA:

Chiropractors treat chronic low back and neck pain, but there is limited evidence of the effectiveness of their treatment **METHODS:** A 3-month longitudinal study of 2024 patients with chronic low back pain or neck pain receiving care from 125 chiropractic clinics at six locations throughout the United States was conducted. Ninety-one percent of the sample completed the baseline and 3-month follow-up survey (n=1835). Average age was 49, 74% females, and most of the sample had a college degree, were non-Hispanic White, worked full-time, and had an annual income of \$60,000 or more. Group-level (within-group t tests) and individual-level (coefficient of repeatability) changes on the Patient-Reported Outcomes Measurement Information System (PROMIS-29) v2.0 profile measure was evaluated: six multi-item scales (physical functioning, pain, fatigue, sleep disturbance, social health, emotional distress) and physical and mental health summary scores.

RESULTS:

Within-group t tests indicated significant group-level change ($P < 0.05$) for all scores except for emotional distress, and these changes represented small improvements in health (absolute value of effect sizes ranged from 0.08 for physical functioning to 0.20 for pain). From 13% (physical functioning) to 30% (PROMIS-29 v2.0 Mental Health Summary Score) got better from baseline to 3 months later according to the coefficient of repeatability.

CONCLUSION:

Chiropractic care was associated with significant group-level improvement in health-related quality of life over time, especially in pain. But only a minority of the individuals in the sample got significantly better ("responders"). This study suggests some benefits of chiropractic on functioning and well-being of patients with low back pain or neck pain.

*LEVEL OF EVIDENCE:*3.

Unilateral PA's increase lumbar and hamstring ROM

Time-course changes associated with PA lumbar mobilizations on lumbar and hamstring range of motion: a randomized controlled crossover trial**Paul Chesterton** , **William Evans** , **Nick Livadas**  & **Shaun J. McLaren** 

- <https://doi.org/10.1080/10669817.2018.1542558>


Objective: We aimed to compare the post-intervention time-course changes in active knee extension (AKE) and active lumbar flexion (ALF) range of motion in response to unilateral posterior–anterior (UPA) mobilizations of the lumbar spine (L4/5 zygapophyseal).

Methods: Twenty-four asymptomatic participants (maleness: 0.58, age [mean \pm standard deviation]: 32 ± 8 years, body mass index 25.9 ± 2.6 kg m²) were recruited to a fully controlled crossover trial. Following either the intervention (L4/5 zygapophyseal mobilizations) or control, participants immediately performed the AKE and ALF tests, which were also performed at baseline. Subsequent tests were made at intervals of 5, 10, 15, 20, 25, 30, 45 and 60 min.

Results: After adjustment for baseline (mean AKE: 37.2° from full extension, mean ALF: 14.37 cm), sex and age, UPA lumbar mobilizations had a most likely moderate effect on AKE (9.8° closer to full extension; ± 1.9) and a likely moderate effect on ALF (1.34 cm; $\pm 90\%$ confidence limits 0.43). The magnitude of the AKE effect became most likely small 20-min posttreatment (5.3; ± 1.7) and possibly small/possibly trivial 60-min posttreatment (2.1; ± 1.4). For ALF, the magnitude of the effect became most likely small 15-min posttreatment (0.76; ± 0.25), possibly small/possibly trivial 25-min posttreatment (0.38; ± 0.18) and likely trivial 60-min posttreatment (0.26; ± 1.8).

Discussion: UPA lumbar mobilizations increased lumbar Range of Motion and hamstring extensibility by a moderate magnitude, with the effect reducing after 10–20-min posttreatment. Clinicians should consider these time-course changes when applying UPA lumbar mobilizations.

Centralization CPR

Initial pain and disability characteristics can assist the prediction of the centralization phenomenon on initial assessment of patients with low back painAlon Rabin , Yaniv Shmushkevich & Leonid Kalichman

- <https://doi.org/10.1080/10669817.2018.1542560>


Objectives: Determine whether the achievement of the centralization phenomenon on initial assessment of patients with low back pain (LBP) can be predicted by history and physical examination variables.

Methods: Ninety patients referred to physical therapy due to LBP completed pain, disability, and fear-avoidance questionnaires, followed by a complete history and a physical examination based on mechanical diagnosis and therapy principles. Patients were subsequently classified as centralizers or noncentralizers. Univariate, followed by multivariate analysis was performed to identify history and physical examination variables that predicted the occurrence of the CP. Factors retained in the multivariate analysis were used to develop a clinical prediction rule (CPR).

Results: Twenty-eight patients (31%) were classified as centralizers immediately following assessment. Three predictors were retained in the multivariate analysis: (1) modified Oswestry Disability Index score lower than 33%; (2) intensity of the most distal symptom lower than 6/10; and (3) back pain equal to or greater than leg pain. The resultant CPR indicated the presence of all three variables increased the post-test likelihood of the CP to 57%.

Discussion: The findings of this study suggest the CP may be considerably more likely in less severe cases of LBP characterized by lower disability, lower intensity of distal symptoms, and a greater back-versus-leg pain intensity. Pending future validation, the CPR developed in this study may aid decision making regarding the initial management strategy of patients with LBP.

45 B. MANUAL THERAPY CERVICAL**Alar ligament testing****Articles****Diagnostic accuracy and validity of three manual examination tests to identify alar ligament lesions: results of a blinded case-control study**

Piekartz Harry Von , Rakan Maloul, Marisa Hoffmann, Toby Hall , Med Martin Ruch & Nicolaus Ballenberger

- <https://doi.org/10.1080/10669817.2018.1539434>

Introduction: Tests to evaluate the integrity of the alar ligaments are important clinical tools for manual therapists, but there is limited research regarding their validity.

Method: A single blinded examiner assessed alar ligament integrity using the lateral shear test (LST), rotation stress test (RST) and side-bending stress test (SBST) on a sample of convenience comprising 7 subjects with MRI confirmed alar ligament lesions and 11 healthy people. Alar ligament lesions were identified using both supine and high-field strength upright MRI.

Results: The RST had a sensitivity of 80% and a specificity of 69.2%. The SBST and the LST both showed a sensitivity of 80% and a specificity of 76.9%. In cases where all three tests were positive, the specificity increased to 84.6%.

Discussion: Tests of manual examination of alar ligament integrity have some diagnostic utility; however, these findings require further corroboration in a larger sample.

45 D. MANUAL THERAPY EXTREMITIES**Low vs high force on hip pain and impairment**

June 2019 Volume 41, Pages 43–48

Comparison of high, medium and low mobilization forces for reducing pain and improving physical function in patients with hip osteoarthritis: Secondary analysis of a randomized controlled trialElena Estébanez-de-Miguel^{a**} Sandra Jimenez-del-Barrio^b María Fortún- Agud^c Elena Bueno-Gracia^a Miguel Malo-Urriés^a Luis Ceballos-Laita^bDOI: <https://doi.org/10.1016/j.msksp.2019.03.007>**Highlights**

- A low force LADM produces the largest reduction in pain.
- A high force LADM produces the largest improvement in physical function.
- The effects of joint mobilization are modulated by the intensity of force applied.

Abstract**Background**

Long-axis distraction mobilization (LADM) of the hip has been shown to reduce pain and improve physical function in hip osteoarthritis (OA). The optimal intensity of mobilization force necessary to reduce pain and improve physical function is unknown.

Objective

To compare the effects on pain and physical function of three different intensities of LADM mobilization force in hip OA patients.

Design

Randomized controlled trial.

Methods

Sixty patients with unilateral hip OA were randomized to three groups: low, medium or high force mobilization group. Participants received three treatment sessions of LADM. Pressure pain thresholds (PPT) at hip, knee and heel, physical function (Western Ontario and McMaster Universities physical function subscale, timed up and go and 40 m self-placed walk test) and pain after the physical function tests (visual analogic scale) were assessed before and after the intervention.

Results

The three treatment groups showed significant improvements in pain and in physical function ($p < 0.05$). The low-force group showed the largest effects size for pain ($d = 2.0$) and the greatest mean percentage increase in PPTs (hip = 30.3%, knee = 34.6%, heel = 25.6%). The high-force group showed the largest effects size for physical function ($d = 0.5–0.7$).

Conclusion

A low-force LADM produced the largest reduction in pain and a high-force LADM the largest improvement in physical function in hip OA patients. The improvements in pain and physical function after LADM in hip OA patients appear to be modulated by the intensity of the mobilization force.

Lateral epicondylitis

Clin J Pain. 2019 May;35(5):435-442. doi: 10.1097/AJP.0000000000000696.

The Association Between Conditioned Pain Modulation and Manipulation-induced Analgesia in People With Lateral Epicondylalgia.

Muhsen A^{1,2}, Moss P¹, Gibson W³, Walker B⁴, Jacques A^{1,4}, Schug S⁵, Wright A¹.

OBJECTIVES:

Conditioned pain modulation (CPM) and manipulation-induced analgesia (MIA) may activate similar neurophysiological mechanisms to mediate their analgesic effects. This study assessed the association between CPM and MIA responses in people with lateral epicondylalgia.

MATERIALS AND METHODS:

Seventy participants with lateral epicondylalgia were assessed for CPM followed by MIA. A single assessor measured pressure pain thresholds (PPT) before, during, and after cold water immersion (10°C) of the asymptomatic hand and contralateral lateral glide (CLG) mobilization of the neck. For analyses, linear mixed models evaluated differences in CPM and MIA responses. Pearson partial correlations and regression analyses evaluated the association between CPM and MIA PPT.

RESULTS:

There was a significant increase (CPM and MIA, $P < 0.001$) in PPT from baseline during the interventions (CPM mean: 195.84 kPa for elbow and 201.87 kPa for wrist, MIA mean: 123.01 kPa for elbow and 126.06 kPa for wrist) and after the interventions (CPM mean: 126.06 kPa for elbow, 114.24 kPa for wrist, MIA mean: 123.50 kPa for elbow and 122.16 kPa for wrist). There were also significant moderate and positive partial linear correlations (r : 0.40 to 0.54, $P < 0.001$) between CPM and MIA measures, controlling for baseline measures. Regression analyses showed that CPM PPT was a significant predictor of MIA PPT ($P < 0.001$) and the models explained between 73% and 85% of the variance in MIA PPT.

DISCUSSION:

This study showed that CPM and MIA responses were significantly correlated and that the CPM response was a significant predictor of MIA response.

48 A. STM

Friction massage and improved supination

Immediate improvements of supination range of motion and strength following pronator teres muscle friction massage: a clinical trial comparing people with and without supination limited motion

Jun-hee Kim, Ui-jae Hwang, Sung-hoon Jung, Gyeong-tae Gwak & Oh-yun Kwon

- <https://doi.org/10.1080/10669817.2018.1542559>

Objectives: To investigate the effects of friction massage techniques on the pronator teres muscle on supination range of motion (ROM) and supinator strength in individuals with and without limited supination ROM.

Methods: In total, 26 subjects (13 with limited supination ROM and 13 healthy subjects) volunteered to participate in this study. We used a customized wrist cuff. Supination ROM and supinator strength were measured with a 9-axis inertial motion sensor and load cell. The friction massage protocol was executed with the pronator teres muscle in a relaxed position. Then supination ROM and supinator strength were measured again.

Results: There was no significant interaction effect on supination ROM, which was significantly greater in the limited supination and control groups. A post hoc *t*-test revealed that the limited supination group achieved a significantly increased post-test supination ROM ($51.7 \pm 7.8^\circ$) compared to the pre-test value ($43.6 \pm 5.2^\circ$). In addition, the control group achieved a significant increase in post-test supination ROM ($67.7 \pm 10.0^\circ$) compared to the pre-test value ($61.4 \pm 7.7^\circ$). There was no significant interaction effect on supinator strength. Supinator strength was significantly greater in the limited supination and control groups. A post hoc *t*-test revealed a significant difference in supinator strength between the pre- and post-test values in the limited supination group.

Discussion: Friction massage helps restore a limited ROM of the forearm supination motion and immediately increases supinator muscle strength. This technique can be used as an intervention method to improve muscle strength in patients with limited supination ROM.

57. GAIT**Changes in gait with neck pain****June 2019** Volume 41, Pages 23–27**Gait speed and gait asymmetry in individuals with chronic idiopathic neck pain**Muge Kirmizi Ibrahim Engin Simsek, Ata Elvan^bOmer Akcali^cSalih Angin^bDOI: <https://doi.org/10.1016/j.msksp.2019.03.001>**Highlights**

- Individuals with chronic idiopathic neck pain exhibit slower and asymmetric gait.
- Gait asymmetry did not differ significantly between gait speed conditions.
- The causes of asymmetric gait should be investigated in individuals with neck pain.

Abstract**Background**

Recent studies have shown that individuals with chronic idiopathic neck pain (CINP) exhibit altered spatiotemporal gait parameters. Problems arising from the neck joints and related soft tissues, and most mechanical neck pain appear asymmetric. However, whether individuals with CINP have an asymmetric gait has not been clarified.

Objectives

The aim was to investigate if there was a significant difference in gait speed (GS) and gait asymmetry (GA) between individuals with CINP and healthy controls.

Design

Case-Control Study.

Method

Twenty individuals with CINP and 20 healthy controls were included. All participants performed the 10-m walking test in three walking conditions: preferred walking (PW), preferred walking with head rotation and walking at maximum speed (MAXW). The timing gate system and pressure sensitive insoles were used to calculate GS and GA, respectively. GA was calculated using the difference between right and left swing durations.

Results/findings

Individuals with CINP had slower GS in all walking conditions compared to controls ($p < 0.05$). In PW and MAXW conditions, gait was found to be asymmetric in individuals with CINP compared to controls ($p < 0.05$). There was no difference in GA between the walking conditions in either group ($p > 0.05$).

Conclusions

Individuals with CINP had a slower and more asymmetrical gait. GA should be evaluated as a part of the routine gait analysis since it has potential to cause asymmetric loading on joints which could cause other musculoskeletal problems in the long-term. Also, future research is needed to clarify the reasons why gait is more asymmetric in individuals with CINP.

59. PAIN**Chronic pain 6 years after major trauma****Incidence of chronic pain 6 y after major trauma**

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Background

Life saving measures is the main focus in the initial treatment of major trauma. In surviving patients, chronic pain may be a serious problem, but the long term incidence and potential risk factors are not very well studied.

Methods

All adult trauma patients included in the institutional trauma registry in 2007 were assessed for eligibility. Among exclusion criteria were: Injury Severity Score < 9, endotracheal intubation before or during admission, spinal cord lesion, known chronic drug or substance abuse, major surgery within 3 h after admission. A patient questionnaire was sent out 6 y after injury focusing on frequency and intensity of pain. A subgroup analysis was done in patients with thoracic injuries, comparing patients with epidural analgesia (EDA) and patients without.

Results

Sixty-eight patients were included in the study. Sixty-nine percent reported pain 6 y after injury and 24% had severe pain. The severity of the injury was a risk factor for development of chronic pain, whereas pain during initial hospital stay was not. In patients with thoracic injuries there was no correlation between initial treatment with EDA and decreased incidence of chronic pain, however patient numbers were small. Opioids were the main analgesics used initially; no patients received non-steroidal anti-inflammatory drugs or peripheral nerve blocks during the first 24 h.

Conclusion

Two thirds of the trauma patients had chronic pain 6 y after injury and one out of four had severe pain. The initial pain treatment was focused on opioids.

Oxytocin and pain perception

Oxytocin Effects on Pain Perception and Pain AnticipationSabine C. Herpertz*¹ Mike M. Schmitgen*¹DOI: <https://doi.org/10.1016/j.jpain.2019.04.002>**Highlights**

- •OT modulates pain processing in the ventral striatum.
- •OT counteracts sensitization to repeated pain stimuli via the anterior insula.
- •OT acts on pain anticipation in the posterior insula boosting associative learning.
- •OT enhances the conditioned fear of pain response mediated in the ventral striatum.

Abstract

There is an ongoing debate whether the neuropeptide oxytocin (OT) modulates pain processing in humans. This study differentiates behavioral and neuronal OT effects on pain perception and pain anticipation by using a Pavlovian conditioning paradigm. Forty-six males received intranasally administered OT in a randomized double-blind, placebo-controlled group design. Although OT exerted no direct effect on perceived pain, OT was found to modulate the blood-oxygen-level-dependent response in the ventral striatum for painful versus warm unconditioned stimuli (US) and to decrease activity in the anterior insula with repeated thermal pain stimuli. Regarding pain anticipation, OT increased responses to CS_{pain} versus CS_{minus} in the nucleus accumbens. Furthermore, in the OT condition increased correct expectations, particularly for the most certain CS-US associations (CS_{minus} and CS_{pain}), were found as well as greatest deactivations in the right posterior insula in response to the least certain condition (CS_{warm}) with posterior insula activity and correct expectancies being positively correlated. In conclusion, OT appears to have both, a direct effect on pain processing via the ventral striatum and by inducing habituation in the anterior insula as well as on pain anticipation by boosting associative learning in general and the neuronal conditioned fear of pain response in particular.

Perspective

The neuropeptide oxytocin (OT) has recently raised the hope to offer a novel avenue for modulating pain experience. This study found OT to modulate pain processing and to facilitate the anticipation of pain inspiring further research on OT effects on the affective dimension of the pain experience.

62 A. NUTRITION/VITAMINS

CV prevention

Mediterranean, but not lacto-ovo-vegetarian, diet positively influence circulating progenitor cells for cardiovascular prevention: The CARDIVEG study

Nutrition, Metabolism & Cardiovascular Diseases
Cesari F, et al. | April 04, 2019

In this CARDIVEG study, which included 80 clinically healthy subjects, researchers assessed the possible connection between dietary habits and progenitor cells via data obtained from a randomized crossover trial using two different diets—lacto-ovo-vegetarian (VD) and Mediterranean (MD).

They randomized participants with low-to-moderate cardiovascular risk profiles to isocaloric VD and MD diets lasting 3 months each, which then crossed. Investigators found that VD diet in omnivores for 3 months did not lead to significant progenitor cell improvement. In this study population, MD, but not VD, had a significant, positive effect on the circulation of progenitor cells, likely acting through modulation of inflammatory parameters.