

1. LUMBAR SPINE

Ligamentous compartments

European Spine Journal pp 1–10| Cite as

Ligamental compartments and their relation to the passing spinal nerves are detectable with MRI inside the lumbar neural foramina

- Dina Wiersbicki Anna Völker Christoph-Eckhard Heyde Hanno Steinke

Purpose

Intraforaminal ligaments (IFL) in lumbar neural foramina (NF) and their relation to the lumbar spinal nerves (SN) are addressed.

Method

Giemsa- and PAS-stained plastinated body slices of 15 lumbar spines were made and compared to MRI and CT data acquired of the same fresh specimens. We dissected one fixed lumbar spine to discuss our results with previous literature. Macroscopic pathophysiological changes and operational interventions at these lumbar spines were excluded.

Results

In the NF, thin medial IFL touch the SN. As a second compartment, intermedial vertical IFL are seen. A third lateral horizontal compartment of IFL is formed by thick cranial and caudal ligaments. Ligaments of the second and third compartments have no direct contact with the SN. From medial to lateral, the IFL thicken. All compartments are 3D reconstructed. If compartments of the IFL have no direct contact with the SN seen in the slices, a connection was noticed after dissection.

Conclusion

Manual dissection seems to be inappropriate for a detailed study of the IFL. The lateral and intermedial compartments being free of the SN may transmit power and protect the SN, while the thin medial IFL may lead the SN passing the NF under physiological conditions. We conclude from the close topographical relation that the IFL may be relevant in foraminal stenosis. Any herniation in the NF presses IFL to the SN. Therefore, we think the IFL themselves could cause neurogenic claudication in case of their non-physiological turnover. Visualisation of IFL seems to be possible by using MRI.

2. LBP

Neuroscience and LBP

J Man Manip Ther. 2019 Jun 4:1-10. doi: 10.1080/10669817.2019.1624006.

Immediate effect of pain neuroscience education for recent onset low back pain: an exploratory single arm trial.

Louw A^{1,2}, Farrell K², Choffin B², Foster B², Lunde G², Snodgrass M², Sweet R², Weitzel M², Wilder R², Puentedura EJ^{1,3}.

Study Design: A prospective, single-arm, pre-postintervention study.

Objective: To determine the preliminary usefulness of providing pain neuroscience education (PNE) on improving pain and movement in patients presenting with non-chronic mechanical low back pain (LBP).

Background: PNE has been shown to be an effective intervention for the treatment of chronic LBP but its usefulness in patients with non-chronic LBP has not been examined.

Methods: A single group cohort pilot study was conducted. Eighty consecutive patients with LBP < 3 months completed a demographics questionnaire, leg and LBP rating (Numeric Pain Rating Scale - NPRS), disability (Oswestry Disability Index), fear-avoidance (Fear-Avoidance Beliefs Questionnaire), pain catastrophizing (Pain Catastrophizing Scale), central sensitization (Central Sensitization Inventory), pain knowledge (Revised Neurophysiology of Pain Questionnaire), risk assessment (Keele STarT Back Screening Tool), active trunk flexion and straight leg raise (SLR). Patients received a 15-minute verbal, one-on-one PNE session, followed by repeat measurement of LBP and leg pain (NPRS), trunk flexion and SLR.

Results: Immediately after intervention, LBP and leg pain improved significantly ($p < 0.001$), but the mean change did not exceed minimal clinically important difference (MCID) of 2.0. Active trunk flexion significantly improved ($p < 0.001$), with the mean improvement (4.7 cm) exceeding minimal detectable change (MDC). SLR improved significantly ($p = 0.002$), but mean change did not exceed MDC.

Conclusions: PNE may be an interesting option in the treatment of patients with non-chronic mechanical LBP. The present pilot study provides the rationale for studying larger groups of patients in controlled studies over longer periods of time.

7. PELVIC ORGANS/WOMAN'S HEALTH

MRI better than Mamogram

MRI vs mammography for breast cancer screening in women with familial risk (FaMRIsc): A multicentre, randomized, controlled trial

The Lancet Oncology —

Saadatmand S, et al. | June 19, 2019

By performing a multicenter, randomized, controlled trial (FaMRIsc), MRI screening was compared with mammography in screening women with familial risk for breast cancer.

Eligible participants were those who aged 30-55 years with a cumulative lifetime breast cancer risk of at least 20% due to a familial predisposition, but were *BRCA1*, *BRCA2*, and *TP53* wild-type. Women who were breastfeeding, pregnant, had a previous breast cancer screen, or had a previous diagnosis of ductal carcinoma in situ, were eligible for participation. Among 1,355 women who provided consent for randomization and 231 who provided consent for registration, 675 were randomized to receive annual MRI and clinical breast examination plus biennial mammography (MRI group) and 680 were allocated to receive annual mammography and clinical breast examination (mammography group).

Outcomes revealed that cancer can be detected at an earlier stage using MRI screening vs mammography. A reduction in the use of adjuvant chemotherapy and decrease in breast cancer-related mortality could result from the low number of late-stage cancers identified in incident rounds. The advantages of the MRI screening approach could come with more false-positive results, particularly with high breast density.

Impact of maternal smoking

BMJ Open. 2019 Jun 12;9(6):e023852. doi: 10.1136/bmjopen-2018-023852.

Maternal smoking during pregnancy and offspring body composition in adulthood: Results from two birth cohort studies.

da Silva Magalhães EI¹, Peixoto Lima N¹, Baptista Menezes AM¹, Gonçalves H¹, Wehrmeister FC¹, Formoso Assunção M¹, Lessa Horta B¹.

OBJECTIVE:

To evaluate the association of maternal smoking during pregnancy with offspring body composition in adulthood and explore the causality of this association.

DESIGN:

Birth cohort.

SETTING:

Population-based study in Pelotas, Brazil.

PARTICIPANTS:

All newborn infants in the city's hospitals were enrolled in 1982 and 1993. At a mean age of 30.2 and 22.6 years, the 1982 and 1993 cohorts, respectively, followed the subjects and 7222 subjects were evaluated.

PRIMARY OUTCOME MEASURES:

Body mass index (BMI), fat mass index, android to gynoid fat ratio, waist circumference, waist to height ratio, lean mass index and height.

RESULTS:

Prevalence of maternal smoking during pregnancy was 35.1% and 32.6%, in 1982 and 1993 cohorts, respectively. Offspring of smoking mothers showed higher mean BMI (β : 0.84; 95% CI: 0.55 to 1.12 kg/m²), fat mass index (β : 0.44; 95% CI: 0.23 to 0.64 kg/m²), android to gynoid fat ratio (β : 0.016; 95% CI: 0.010 to 0.023), waist circumference (β : 1.74; 95% CI: 1.15 to 2.33 cm), waist to height ratio (β : 0.013; 95% CI: 0.010 to 0.017) and lean mass index (β : 0.33; 95% CI: 0.24 to 0.42 kg/m²), whereas height was lower (β : -0.95; -1.26 to -0.65). Weight gain in the first 2 years captured most of the association of maternal smoking with BMI (96.2%), waist circumference (86.1%) and fat mass index (71.7%).

CONCLUSIONS:

Maternal smoking in pregnancy was associated with offspring body composition measures in adulthood.

Post pregnancy urinary incontinence

Am J Obstet Gynecol. 2019 May 20. pii: S0002-9378(19)30680-5. doi: 10.1016/j.ajog.2019.05.022

The effect of childbirth on urinary incontinence: a matched cohort study in women aged 40-64 years.

Gyhagen M¹, Åkervall S², Molin M³, Milsom I⁴.

BACKGROUND:

The relative impact of age, pregnancy and vaginal delivery on urinary incontinence is still an unresolved issue that involves the controversial question about the protective effect of cesarean section.

OBJECTIVES:

The purpose was to estimate and compare the effect size of one pregnancy, one vaginal delivery, and the derived protective effect of cesarean section for different aspects of urinary incontinence in women aged between 40 to 65 years, all 20 years after birth.

STUDY DESIGN:

This Swedish, nationwide matched cohort study involved 14,335 women. Three restricted, randomly selected, source cohorts of nulliparous women, unexposed to childbirth (n=9,136), one-para cesarean delivered women, exposed to one pregnancy (n=1,412), and one-para exposed to one pregnancy followed by vaginal delivery (n=3,787) were retrieved from The Swedish Medical Birth Register and Statistics Sweden and surveyed in 2008 and 2014 respectively. Parous women were all assessed 20 years postnatally. One-to-one matching with an interval for pairing of three years and three BMI units was used in women aged 40 to 64 years with information about BMI (kg/m²) and urinary incontinence. The procedure succeeded in 2,630 out of 2,635 women (99.8%), resulting in an adequate distribution of age and BMI between groups. The surveys used a postal and an internet-based questionnaire with validated questions for various aspects of urinary incontinence. Fisher's exact test and the Mann-Whitney U test was used for comparisons between matched groups and trend was analysed with Mantel-Haenszel statistics. Predicted, age-related values of different aspects of urinary incontinence were obtained by logistic regression analysis.

RESULTS:

Pregnancy increased the prevalence of urinary incontinence from 20.1% to 30.1% (odds ratio [OR], 1.71; 95% confidence interval [CI], 1.43-2.05, P< .0001). Urinary incontinence increased further after vaginal delivery to 43.0% (OR, 1.75; 95% CI, 1.49-2.05; P< .0001) and 'Moderate and Severe' urinary incontinence from 12.7% to 19.5% (OR, 1.67; 95% CI, 1.35-2.07; P< .0001). There was a parallel increase in urinary incontinence from 40 to 65 years in nulliparous, vaginally and cesarean delivered women. Cesarean section compared to vaginal delivery was associated with a 30.0% reduction of urinary incontinence (P< .0001) and 35% to 52% reduction of more severe grades of urinary incontinence (P< .0001) and was unaffected by age.

CONCLUSIONS:

Both pregnancy and vaginal delivery incurred an increased risk of urinary incontinence in the long-term. The age-related gap for urinary incontinence between nulliparous and one-para women delivered by vaginal delivery or cesarean section was constant between parallel trajectories that spanned ages between 40 and 65 years. The calculated protective effect of cesarean section was unaltered and significant during the same age interval.

Fetal glycaemic impact

Diabet Med. 2019 May 20. doi: 10.1111/dme.13988.

Maternal glycaemic control and risk of neonatal hypoglycaemia in Type 1 diabetes pregnancy: a secondary analysis of the CONCEPTT trial.

Yamamoto JM^{1,2}, Corcoy R^{3,4}, Donovan LE^{1,2}, Stewart ZA^{5,6}, Tomlinson G⁷, Beardsall K^{8,9}, Feig DS^{10,11,12}, Murphy HR^{5,13,14}; CONCEPTT Collaborative Group*.

AIMS:

To examine the relationship between maternal glycaemic control and risk of neonatal hypoglycaemia using conventional and continuous glucose monitoring metrics in the Continuous Glucose Monitoring in Type 1 Diabetes Pregnancy Trial (CONCEPTT) participants.

METHODS:

A secondary analysis of CONCEPTT involving 225 pregnant women and their liveborn infants. Antenatal glycaemia was assessed at 12, 24 and 34 weeks gestation. Intrapartum glycaemia was assessed by continuous glucose monitoring measures 24 hours prior to delivery. The primary outcome was neonatal hypoglycaemia defined as glucose concentration < 2.6 mmol/l and requiring intravenous dextrose.

RESULTS:

Neonatal hypoglycaemia occurred in 57/225 (25.3%) infants, 21 (15%) term and 36 (40%) preterm neonates. During the second and third trimesters, mothers of infants with neonatal hypoglycaemia had higher HbA_{1c} [48 ± 7 (6.6 ± 0.6) vs. 45 ± 7 (6.2 ± 0.6); $P = 0.0009$ and 50 ± 7 (6.7 ± 0.6) vs. 46 ± 7 (6.3 ± 0.6); $P = 0.0001$] and lower continuous glucose monitoring time-in-range (46% vs. 53%; $P = 0.004$ and 60% vs. 66%; $P = 0.03$). Neonates with hypoglycaemia had higher cord blood C-peptide concentrations [1416 (834, 2757) vs. 662 (417, 1086) pmol/l; $P < 0.00001$], birthweight > 97.7th centile (63% vs. 34%; $P < 0.0001$) and skinfold thickness ($P \leq 0.02$). Intrapartum continuous glucose monitoring was available for 33 participants, with no differences between mothers of neonates with and without hypoglycaemia.

CONCLUSIONS:

Modest increments in continuous glucose monitoring time-in-target (5-7% increase) during the second and third trimesters are associated with reduced risk for neonatal hypoglycaemia. While more intrapartum continuous glucose monitoring data are needed, the higher birthweight and skinfold measures associated with neonatal hypoglycaemia suggest that risk is related to fetal hyperinsulinemia preceding the immediate intrapartum period.

Exercise and continuance

Exercise intervention in the management of urinary incontinence in older women in villages in Bangladesh: A cluster randomised trial

The Lancet Global Health

Wagg A, et al. | June 14, 2019

Via a cluster randomised trial on 3,577 recruited women from 16 pairs of villages in Bangladesh, the researchers intended to evaluate effectiveness of a group intervention that comprised pelvic floor muscle training, mobility exercises, and bladder education over the education alone, and report changes between villages rather than between individual participants. Change in number of leakage episodes between baseline and 24 weeks in some women was observed. No adverse events were observed.

Hence, it was concluded that a structured group-exercise intervention had the potential for the management of the urinary incontinence in older women in communities largely outside the reach of pharmaceutical or surgical interventions.

8. VISCERA

Spinal pain link to CV problems in women

European Spine Journal pp 1–10| Cite as

Spinal pain is prospectively associated with cardiovascular risk factors in girls but not boys (CHAMPS study-DK)

- Jeffrey J. Hebert Heidi Klakk Claudia Franz Martin Sénéchal Neil Manson Niels Wedderkopp

Purpose

To examine the prospective associations between spinal pain exposures and risk factors for cardiovascular disease in children and explore the mediating role of health-related physical activity.

Methods

Students were recruited from ten public primary schools. Each week from November 2008 to October 2010, parents reported spinal pain occurrences in their children via text messaging. Clustered cardiovascular risk was estimated with a composite score comprising fasting serum triglycerides, homeostasis assessment model-estimated insulin resistance (HOMA-IR), total to high-density lipoprotein cholesterol ratio, and systolic blood pressure. Additional outcomes were fasting serum insulin and glucose concentrations and body mass index categories. Associations were explored with multilevel mixed regression models and reported with beta coefficients (β) and percent difference scores. All models were adjusted for potential confounders.

Results

Data from 1022 children (53% female) with mean \pm SD age of 8.4 ± 1.4 years were included. Girls with spinal pain had greater clustered cardiovascular risk (β [95% CI]; percent difference [95% CI] = .41 [.02–.80]; 3.3% [.2–6.4%]) than those without spinal pain. Similar outcomes were observed for log insulin (percent difference [95% CI] = 3.4% [.6–6.2%]) and log HOMA-IR = (percent difference [95% CI] = 3.8% [.4–7.3%]). Remaining associations between spinal pain and cardiovascular risk in girls were nonsignificant. There were no associations between spinal pain and cardiovascular risk in boys. Moderate-to-vigorous-intensity physical activity did not appear to mediate this relationship.

Conclusion

These findings suggest a potentially important link between spinal pain and cardiovascular risk in girls that may be independent of health-related physical activity.

12 A. WHIPLASH

PT and widespread pain

BMC Musculoskelet Disord. 2019 Jun 5;20(1):251. doi: 10.1186/s12891-019-2621-1.

Effect of intensive inpatient physical therapy on whole-body indefinite symptoms in patients with whiplash-associated disorders.

Matsui T^{1,2}, Iwata M¹, Endo Y¹, Shitara N¹, Hojo S¹, Fukuoka H¹, Hara K², Kawaguchi H³.

BACKGROUND:

A considerable number of patients with whiplash-associated disorders (WAD) report variable and indefinite symptoms involving the whole body, despite there being no evidence of direct injuries to organs other than the neck. However, little is known about their management or underlying mechanism. This study examined the effect of intensive physical therapy at the cervical muscles in patients with WAD reporting whole-body indefinite symptoms.

METHODS:

A total of 194 hospitalized patients with WAD who were resistant to outpatient care by reporting whole-body indefinite symptoms between May 2006 and May 2017 were enrolled in this observational study. All patients underwent daily physical therapies by low-frequency electric stimulation therapy and far-infrared irradiation to the cervical muscles during hospitalization. Self-rated records in the medical interview sheets on 22 representative whole-body symptoms at admission and discharge were compared.

RESULTS:

The number of symptoms was markedly decreased by the physical therapies during hospitalization. Almost all symptoms showed recovery rates of more than 80% at discharge as compared to those at admission. Although the percentage of patients reporting at least four of the 22 representative indefinite symptoms was 99.0% at admission, it decreased to 7.7% at discharge. Sixteen percent of patients recovered completely without any residual symptoms. The mean number of symptoms significantly decreased from 13.1 at admission to 2.0 at discharge. Notably, symptoms other than those in the neck or shoulder recovered to a greater extent than those in the neck or shoulder.

CONCLUSIONS:

This study, for the first time, examined the management of whole-body indefinite symptoms in patients with WAD. The intensive physical therapy markedly improved the symptoms, suggesting the involvement of cervical muscles in the pathogenesis.

Soft collars do not seem to be of benefit

European Spine Journal pp 1–8| Cite as

The role of non-rigid cervical collar in pain relief and functional restoration after whiplash injury: a systematic review and a pooled analysis of randomized controlled trials

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Carmelo Lucio Sturiale

Purpose

Whiplash injury (WI) represents a common diagnosis at every emergency department. Several investigations have been conducted to compare the different medical managements for non-surgical cases. However, the role of the immobilization with a non-rigid cervical collar (nRCC) for pain management and range of motion (RoM) preservation has not been completely clarified.

Methods

We performed a systematic review of the randomized control trials (RCTs) and a pooled analysis in order to investigate the role of the nRCC for pain management, scored through the visual analogue scale (VAS) and the RoM, by comparing the use of a nRCC (for 1–2 weeks) with a non-immobilization protocols, regardless of the association with physical therapy (PhT). Only patients with whiplash-associated disorders grade I–II were included. Due to a certain heterogeneity across the RCTs, follow-up period time range resetting was necessary in order to pool the data.

Results

A total of 141 papers were reviewed; 6 of them matched the inclusion criteria and were admitted to the final study. Pooled analysis showed that nRCC does not improve the outcome in terms of VAS score and RoM trends along the follow-up. Moreover, VAS and RoM trends seem to further improve at long-term follow-up in non-immobilization associated with PhT group.

Conclusions

This pooled analysis of the available RCTs shows the absence of an advantage of the immobilization protocol with a nRCC after a WI. On the contrary, non-immobilization protocols show an overall better trend of pain relief and neck mobility recovery, regardless of the association of PhT.

13 D. SLEEP**Napping and cognitive decline****Objective napping, cognitive decline, and risk of cognitive impairment in older men**YueLeng^aSusanRedline^bKatie L.Stone^cSoniaAncoli-Israel^dKristineYaffe^e<https://doi.org/10.1016/j.jalz.2019.04.009>Get rights and content

Highlights

- Older men with long daily naps had greater risk of cognitive impairment in 12 years.
- Napping is more relevant to cognitive impairment in those with better nocturnal sleep.
- Objective naps might be useful as an early marker of clinically significant cognitive impairment in the elderly.

Abstract

Introduction

Little is known about the longitudinal association between napping and cognitive impairment in older adults.

Methods

We used wrist actigraphy to measure naps in 2751 community-dwelling older men. Cognition was assessed repeatedly over 12 years, and clinically significant cognitive impairment was determined by physician diagnosis, Alzheimer's medication use or a significant cognitive decline.

Results

After adjustment for all covariates, men with longer napping duration had greater cognitive decline and higher risk of cognitive impairment. Men who napped for ≥ 120 min/day (vs. < 30 min/day) were 66% more likely to develop cognitive impairment (odds ratio = 1.66, 95% CI: 1.09–2.54) in 12 years. Further adjustment for nighttime sleep quality did not appreciably alter the results. The association between napping and cognitive impairment was more pronounced among those with higher sleep efficiency and average sleep duration.

Discussion

Napping might be useful as an early marker of cognitive impairment in the elderly, and its cognitive effects may differ by nighttime sleep.

Sleep and HA's

Headache. 2019 May 31. doi: 10.1111/head.13567

Chronobiology and Sleep in Cluster Headache.

de Coo IF^{1,2}, van Oosterhout WPJ^{1,3}, Wilbrink LA¹, van Zwet EW⁴, Ferrari MD¹, Fronczek R^{1,5}.

BACKGROUND:

Cluster headache attacks follow a striking circadian rhythm with an intriguing influence of sleep. We aim to investigate differences in sleep quality, chronotype, and the ability to alter individual sleep rhythms in episodic and chronic cluster headache patients vs controls.

METHODS:

Cluster headache patients and non-headache controls from the Dutch Leiden University Cluster headache neuro-Analysis program aged 18 and above completed web-based questionnaires in a cross-sectional study.

RESULTS:

A total of 478 episodic, 147 chronic cluster headache patients and 367 controls participated. Chronic cluster headache patients had more often early chronotypes than controls, as measured by mid-sleep phase ($P = .021$ adjusted B -15.85 minutes CI $-29.30; -2.40$). Compared to controls, chronic cluster headache participants were less able to alter their sleep rhythms ($P < .001$ adjusted B -1.65 CI $-2.55; 0.74$), while episodic cluster headache participants reported more difficulty in coping with reduced sleep ($P = .025$ adjusted B 0.75 CI $0.09; 1.40$). Sleep quality was reduced in both types of cluster headache compared to controls ("poor sleepers": 71.4% (105/147) in chronic and 48.3% (235/367) in episodic cluster headache vs 25.6% (94/367) in controls; both $P < .001$; episodic adjusted B -1.71 CI $0.10; 0.32$; chronic adjusted B -0.93 CI $0.24; 0.65$).

CONCLUSION:

Sleep quality is decreased in both episodic and chronic cluster headache, most likely caused by cluster headache attacks that strike during the night. Episodic cluster headache patients report more difficulty in coping with reduced sleep, while chronic patients are less able to alter their sleep rhythm. Although not directly proven, cluster headache patients will likely benefit from a structured, regular daily schedule.

Post stroke sleeping

Sleep-disordered Breathing and Post-Stroke Outcomes

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Erin Case BA Lewis B Morgenstern MD Susan Tower MD Devin L Brown MD

<https://doi.org/10.1002/ana.25515>

Objective

To examine the association between sleep-disordered breathing and stroke outcomes, and determine the contribution of sleep-disordered breathing to outcome disparities in Mexican Americans.

Methods

Ischemic stroke patients (N=995), identified from the population-based Brain Attack Surveillance in Corpus Christi Project (2010-2015), were offered participation in a sleep-disordered breathing study including a home sleep apnea test (ApneaLink Plus). Sleep-disordered breathing (respiratory event index \geq 10) was determined soon after stroke. Neurologic, functional, cognitive, and quality of life outcomes were assessed at 90 days post-stroke. Regression models were used to assess associations between sleep-disordered breathing and outcomes, adjusted for socio-demographics, pre-stroke function and cognition, health-risk behaviors, stroke severity, and vascular risk factors.

Results

Median age was 67 years (IQR:59-78); 62.1% were Mexican American. Median respiratory event index was 14 (IQR:6-25); 62.8% had sleep-disordered breathing. Sleep-disordered breathing was associated with worse functional outcome (mean difference in activities of daily living/instrumental activities of daily living score 0.15, 95% CI:0.01,0.28) and cognitive outcome (mean difference in modified Mini Mental State Examination -2.66, 95% CI:-4.85,-0.47) but not neurologic or quality of life outcomes. Sleep-disordered breathing accounted for 9-10% of ethnic differences in functional and cognitive outcome and was associated with cognitive outcome more strongly for Mexican Americans (β =-3.97, 95% CI:-6.63,-1.31) than non-Hispanic whites (β =-0.40, 95% CI:-4.18,3.39, p-interaction=0.15).

Interpretation

Sleep-disordered breathing is associated with worse functional and cognitive function at 90 days post-stroke. These outcomes are reasonable endpoints for future trials of sleep-disordered breathing treatment in stroke. If effective, sleep-disordered breathing treatment may somewhat lessen ethnic stroke outcome disparities.

Testing for Alzheimer's

Association of amyloid and tau with cognition in pre-clinical Alzheimer disease : A longitudinal study

JAMA — Hanseeuw BJ, et al. | June 07, 2019

Through a longitudinal prospective cohort study of 279 clinically normal participants, the contributors intended to determine the correlations measured during different observation periods for 7 years between amyloid- β ($A\beta$), tau, and cognition.

A close link among tau-positron emission tomography (tau-PET), neuronal injury and cognition may be found. Mediated by successive changes in $A\beta$ and tau when measured post 7 years, an association between initial $A\beta$ and final cognition was assessed. For clinical criteria of mild cognitive impairment, persistent changes in normal older adults were identified from $A\beta$ to tau to cognition.

To track disease progression and to detect the earliest Alzheimer disease pathologic changes, repeated tau-PET observations and amyloid-PET observations respectively were crucially concluded.

14. HEADACHES

HA's and Anxiety

Headache. 2019 Jun 5. doi: 10.1111/head.13568

Anxiety Sensitivity as a Risk Indicator for Anxiety, Depression, and Headache Severity in Women With Migraine.

Farris SG¹, Burr EK¹, Abrantes AM^{2,3}, Thomas JG^{2,4}, Godley FA⁵, Roth JL^{2,6}, Lipton RB^{7,8}, Pavlovic JM^{7,8}, Bond DS^{2,4}.

OBJECTIVE:

The primary aim of this exploratory study was to assess the relationship between anxiety sensitivity and emotional disorders, migraine characteristics, and migraine-related fear and avoidance behaviors in women with probable migraine.

BACKGROUND:

Anxiety and depressive disorders are the most frequent comorbid psychiatric conditions in migraine, particularly in women; however, the underlying reasons for these comorbidities are uncertain. Anxiety sensitivity, the tendency to catastrophically appraise anxiety and bodily sensations in terms of their physical, social, or cognitive consequences, is a psychological factor that may contribute to the comorbidity of anxiety and depressive disorders and migraine. It was hypothesized that anxiety sensitivity would be associated with greater migraine severity and psychiatric symptoms.

METHOD:

Participants were women (n = 100) who screened positive for migraine on the validated ID Migraine Screener participated in an anonymous single-session online survey-based study on migraine. The Anxiety Sensitivity Index-3 total and subscales scores were used to assess anxiety sensitivity. Anxiety and depression symptoms were assessed with the brief Patient Health Questionnaire.

RESULTS:

On average, anxiety sensitivity was clinically elevated (mean \pm SD: 24.0 \pm 15.2). Anxiety sensitivity cognitive and social concerns were most strongly correlated with severity of anxiety (r's = .38-.46) and depressive symptoms (r = .35-.39, P's < .001), and all anxiety sensitivity facets were related to fear of head pain (r's = .35-.38, P's < .001). Anxiety sensitivity cognitive concern facet was uniquely related to headache patterns, including longer migraine attack duration (r = .22, P = .029) and pain intensity (r = .24, P = .029), pain-related avoidance, including avoiding movement and more frequent misuse of prescribed or non-prescribed pain medication (r's = .20-.21, P's < .01).

CONCLUSIONS:

These novel findings indicate that anxiety sensitivity, specifically fearful appraisal of bodily sensations, are linked to both psychiatric symptoms and migraine severity in women. In this cross-sectional study, causal sequence cannot be determined. If anxiety sensitivity leads to more severe pain and psychiatric distress, targeting anxiety sensitivity could lead to better headache outcomes.

22 A. SHOULDER IMPINGEMENT**PT effective compared to surgery**

PLoS One. 2019 May 29;14(5):e0216961. doi: 10.1371/journal.pone.0216961. eCollection 2019.

The effectiveness of surgical vs conservative interventions on pain and function in patients with shoulder impingement syndrome. A systematic review and meta-analysis.

Nazari G^{1,2}, MacDermid JC^{1,3}, Bryant D^{1,2}, Athwal GS^{2,3}.

OBJECTIVE:

To assess the effectiveness of surgical vs conservative interventions on pain and function in patients with subacromial impingement syndrome.

DESIGN:

Systematic review and meta-analysis of randomized controlled trials.

SETTING:

Clinical setting.

PARTICIPANTS:

Patients 18 years and older with subacromial impingement syndrome.

INTERVENTION/COMPARISON:

Surgical intervention plus postoperative physiotherapy / placebo surgery plus physiotherapy or physiotherapy only.

MAIN OUTCOME MEASURES:

Pain and function.

RESULTS:

11 RCTs (n = 919) were included. The pooled results displayed no statistically or clinically different between surgery plus physiotherapy vs physiotherapy alone on pain levels at 3-, 6-months, 5- and 10 years follow up (moderate quality, 3 RCTs, 300 patients, WMD -0.39, 95% CI: -1.02 to 0.23, p = 0.22; moderate quality, 3 RCTs, 310 patients, WMD -0.36, 95% CI: -1.02 to 0.29, p = 0.27; low quality, 1 RCT, 109 patients, WMD -0.30, 95% CI: -1.54 to 0.94, p = 0.64; low quality, 1 RCT, 90 patients, WMD -1.00, 95% CI: -0.24 to 2.24, p = 0.11) respectively. Similarly, the pooled results were not statistically or clinically different between groups for function at 3-, 6-month and 1-year follow ups (very low quality, 2 RCTs, 184 patients, SMD 0.11, 95% CI: -0.57 to 0.79, p = 0.75; moderate quality, 3 RCTs, 310 patients, SMD 0.15, 95% CI: -0.14 to 0.43, p = 0.31; very low quality, 2 RCTs, 197 patients, SMD 0.11, 95% CI: -0.46 to 0.69, p = 0.70) respectively.

CONCLUSION:

The effects of surgery plus physiotherapy compared to physiotherapy alone on improving pain and function are too small to be clinically important at 3-, 6-months, 1-, 2-, 5- and \geq 10-years follow up.

34. PATELLA

Patella alignment and ant. Knee pain

Arthritis Care Res (Hoboken). 2019 Jun 14. doi: 10.1002/acr.24004

Relation of Patellofemoral Joint Alignment, Morphology, and Radiographic Osteoarthritis to Frequent Anterior Knee Pain: The MOST Study.

Macri EM^{1,2}, Neogi T³, Tolstykh I⁴, Widjajahakim R⁵, Lewis CE⁶, Torner JC⁷, Nevitt MC⁴, Roux M⁸, Stefanik JJ^{1,3,9}.

OBJECTIVE:

Patellofemoral (PF) alignment and trochlear morphology are associated with PF osteoarthritis (OA) and knee pain, however it is unknown whether they are associated with localized anterior knee pain (AKP), which is believed to be a symptom specific to PF joint pathology. We therefore aimed to evaluate the relation of PF alignment and morphology, as well as PFOA and tibiofemoral OA, to AKP.

METHODS:

The Multicenter Osteoarthritis Study (MOST) is a cohort study of individuals with, or at risk for, knee OA. We evaluated cross-sectional associations of PF alignment, trochlear morphology, and PF and tibiofemoral radiographic OA, with localized AKP (defined with a pain map). We used two approaches: a within-person knee-matched evaluation of participants with unilateral AKP (conditional logistic regression); and a cohort approach comparing those with AKP to those without (binomial regression).

RESULTS:

With the within-person knee-matched approach (n=110, 64% women, mean age 70, BMI 30.9), PF alignment, morphology, and tibiofemoral OA were not associated with unilateral AKP. Radiographic PFOA was associated with pain, odds ratio 5.3 (95% CI 1.6, 18.3). Using the cohort approach (n=1818, 7% of knees with AKP, 59% women, age 68, BMI 30.4), results were similar: only PFOA was associated with pain, prevalence ratio 2.2 (1.4, 3.4).

CONCLUSION:

PF alignment and trochlear morphology were not associated with anterior knee pain in individuals with, or at risk for, knee OA. Radiographic PFOA, however, was associated with pain, suggesting features of OA, more so than mechanical features, may contribute to localized symptoms. This article is protected by copyright. All rights reserved.

35. KNEE/TOTAL

Sex differences

Arthritis Care Res (Hoboken). 2019 Jun 14. doi: 10.1002/acr.24002.

The effects of depression, low back pain and comorbidities on pain after total knee arthroplasty for osteoarthritis are modified by sex.

Perruccio AV^{1,2,3,4}, Fitzpatrick J¹, Power JD^{2,3}, Gandhi R^{3,4}, Rampersaud YR^{3,4}, Mahomed NN^{3,4}, Davey JR^{3,4}, Syed K^{3,4}, Veillette C^{3,4}, Badley EM^{1,2,3}.

OBJECTIVES:

The influence of sex on post-total knee arthroplasty (TKA) outcomes has been variable in the literature. Though often reported as an average effect, we investigated whether sex modified the influence of pre-surgery characteristics on post-TKA knee pain.

METHODS:

This was a prospective study with data derived from 477 TKA (279 women, 198 men) osteoarthritis patients. Questionnaires were completed pre- and three months post-surgery. The association between 3-month post-TKA knee pain and pre-surgery covariates (body mass index, comorbidity count, symptomatic joint count, low back pain, knee pain, and depressive symptoms) was assessed by linear regression. Sex-specific effects were evaluated using interactions.

RESULTS:

Women had significantly worse pre-surgery knee pain, joint count and depressive symptoms, and worse post-surgery knee pain than men. With simple covariate adjustment, no sex effect on pain was found. However, sex was found to moderate the effects of comorbidities (worse for women ($p=0.013$)), presence of low back pain (worse for men ($p=0.003$)) and depressive symptoms (worse for men ($p<0.001$)) on post-surgery pain. Worse pre-surgery pain was associated with worse post-surgery pain similarly for women and men.

CONCLUSION:

The influence of some patient factors on early post-TKA pain cannot be assumed to be the same for women and men; average effects may mask underlying associations. Results suggest a need to consider sex differences in understanding TKA outcomes, which may have important implications for prognostic tool development in TKA. This article is protected by copyright. All rights reserved.

37. OSTEOARTHRITIS/KNEE**Exercise and knee and hip OA****Efficacy and potential determinants of exercise therapy in knee and hip osteoarthritis: A systematic review and meta-analysis**

panelSiew-LiGoh^{ab}Monica S.M.Persson^aJoanneStocks^aYunfeiHou^cJianhaoLin^cMichelle C.Hall^dMichaelDoherty^aWeiyaZhang^a

<https://doi.org/10.1016/j.rehab.2019.04.006>Get rights and content

Background

Exercise is an effective treatment for osteoarthritis. However, the effect may vary from one patient (or study) to another.

Objective

To evaluate the efficacy of exercise and its potential determinants for pain, function, performance, and quality of life (QoL) in knee and hip osteoarthritis (OA).

Methods

We searched 9 electronic databases (AMED, CENTRAL, CINAHL, EMBASE, MEDLINE Ovid, PEDro, PubMed, SPORTDiscus and Google Scholar) for reports of randomised controlled trials (RCTs) comparing exercise-only interventions with usual care. The search was performed from inception up to December 2017 with no language restriction. The effect size (ES), with its 95% confidence interval (CI), was calculated on the basis of between-group standardised mean differences. The primary endpoint was at or nearest to 8 weeks. Other outcome time points were grouped into intervals, from < 1 month to ≥ 18 months, for time-dependent effects analysis. Potential determinants were explored by subgroup analyses. Level of significance was set at $P \leq 0.10$.

Results

Data from 77 RCTs (6472 participants) confirmed statistically significant exercise benefits for pain (ES 0.56, 95% CI 0.44–0.68), function (0.50, 0.38–0.63), performance (0.46, 0.35–0.57), and QoL (0.21, 0.11–0.31) at or nearest to 8 weeks. Across all outcomes, the effects appeared to peak around 2 months and then gradually decreased and became no better than usual care after 9 months. Better pain relief was reported by trials investigating participants who were younger (mean age < 60 years), had knee OA, and were not awaiting joint replacement surgery.

Conclusions

Exercise significantly reduces pain and improves function, performance and QoL in people with knee and hip OA as compared with usual care at 8 weeks. The effects are maximal around 2 months and thereafter slowly diminish, being no better than usual care at 9 to 18 months. Participants with younger age, knee OA and not awaiting joint replacement may benefit more from exercise therapy. These potential determinants, identified by study-level analyses, may have implied ecological bias and need to be confirmed with individual patient data.

OA and comorbidities

Arthritis Care Res (Hoboken). 2019 Jun 17. doi: 10.1002/acr.24008.

Comorbidities in Osteoarthritis: A systematic review and meta-analysis of observational studies.

Swain S^{1,2}, Sarmanova A^{1,2}, Coupland C³, Doherty M^{1,2}, Zhang W^{1,2}.

OBJECTIVES:

Osteoarthritis (OA) is a common chronic condition in older people but its association with other chronic conditions is largely unknown. This study aimed to systematically review the literature on comorbidities in people with OA compared to those without.

METHODS:

We searched four databases for observational studies on comorbidities in people with OA. Studies of OA only or in comparison with non-OA controls were included. Risk of bias and study quality was assessed using the Newcastle-Ottawa Scale (NOS). The prevalence of comorbidities in the OA group and prevalence ratio (PR) and 95% confidence interval (CI) between OA and non-OA groups were calculated.

RESULTS:

Forty-two studies from 16 countries (27 case-only and 15 comparative studies) met the inclusion criteria. Mean age of participants varied from 51 to 76 years. Pooled prevalence of any comorbidity was 67% (95%CI: 57%-74%) in people with OA versus 56% (95%CI: 44%-68%) in people without OA. The pooled PR for any comorbidity was 1.21 (95%CI: 1.02-1.45). The PR increased from 0.73 (95%CI: 0.43-1.25) for one comorbidity, to 1.58 (95%CI: 1.03-2.42) for two, and 1.94 (95%CI 1.45- 2.59) for three or more comorbidities. The key comorbidities associated with OA were stroke (PR 2.61; 95%CI: 2.13-3.21), peptic ulcer (PR 2.36; 95%CI: 1.71-3.27) and metabolic syndrome (PR 1.94; 95%CI 1.21-3.12).

CONCLUSIONS:

People with OA are more likely to have other chronic conditions. The association is dose-dependent in terms of the number of comorbidities, suggesting multimorbidities. Further studies on the causality of this association and clinical implications are needed. This article is protected by copyright. All rights reserved.

Knee OA and falls

Arthritis Care Res (Hoboken). 2018 Aug 21. doi: 10.1002/acr.23725.

Knee Osteoarthritis and the Risk of Medically Treated Injurious Falls Among Older Adults: A Community-Based US Cohort Study.

Barbour KE¹, Sagawa N², Boudreau RM², Winger ME², Cauley JA², Nevitt MC³, Fujii T⁴, Patel KV⁵, Strotmeyer ES².

OBJECTIVE:

The risk of falls among adults with knee osteoarthritis (OA) has been documented, yet, to our knowledge no studies have examined knee OA and the risk of medically treated injurious falls (overall and by sex), which is an outcome of substantial clinical and public health relevance.

METHODS:

Using data from the Health Aging and Body Composition Knee Osteoarthritis Substudy, a community-based study of white and African American older adults, we tested associations between knee OA status and the risk of injurious falls among 734 participants with a mean \pm SD age of 74.7 ± 2.9 years. Knee radiographic OA (ROA) was defined as having a Kellgren-Lawrence grade of ≥ 2 in at least 1 knee. Knee symptomatic ROA (sROA) was defined as having both ROA and pain symptoms in the same knee. Injurious falls were defined using a validated diagnosis code algorithm from linked Medicare fee-for-service claims. Cox regression modeling was used to estimate hazard ratios (HRs) and 95% confidence intervals (95% CIs).

RESULTS:

The mean \pm SD follow-up time was 6.59 ± 3.12 years. Of the 734 participants, 255 (34.7%) had an incident injurious fall over the entire study period. In the multivariate model, compared with those without ROA or pain, individuals with sROA (HR 1.09 [95% CI 0.73-1.65]) did not have a significantly increased risk of injurious falls. Compared with men without ROA or pain, men with sROA (HR 2.57 [95% CI 1.12-5.91]) had a significantly higher risk of injurious falls. No associations were found for women or by injurious fall type.

CONCLUSION:

Knee sROA was independently associated with an increased risk of injurious falls in older men, but not in older women.

41 A. ACHILLES TENDON AND CALF**Plantaris Tendon pathology**

Sports (Basel). 2019 May 22;7(5). pii: E124. doi: 10.3390/sports7050124.

Prevalence of Coexistent Plantaris Tendon Pathology in Patients with Mid-Portion Achilles Pathology: A Retrospective MRI Study.

Khullar S^{1,2}, Gamage P³, Malliaras P⁴, Huguenin L^{5,6}, Prakash A^{7,8}, Connell D^{9,10}.

Co-existence of Plantaris tendinopathy (PT) in patients with mid-Achilles tendinopathy (Mid-AT) is of clinical significance.

This study aims to describe the MRI-based pathological characteristics of co-existing PT and Mid-AT. One-hundred MRI studies of patients diagnosed with Mid-AT were retrospectively analysed by an experienced musculoskeletal radiologist. Presence or absence of a Plantaris tendon, co-existing PT with Mid-AT, insertional characteristics of Plantaris tendon, and maximum anteroposterior thickness of the tendon in Mid-AT (axial images) were evaluated.

When PT co-existed with Mid-AT, the location of the tendon pathologies in relation to calcaneal insertion was assessed (sagittal images) and their association was analysed using the coefficient of variation (CV) and Pearson's correlation coefficient. Plantaris was present in 84 cases (84%), and Mid-AT and PT co-existed in 10 cases (10%). A greater variability in the location of Plantaris pathology (CV = 42%) than Achilles tendinopathy (CV = 42%) was observed. The correlation coefficient also revealed a low and non-significant association between the location of two pathologies when they exist together ($r = +0.06$; $p = 0.88$).

Clinical evaluation of Achilles tendon pain needs careful consideration into the possible co-existence of Plantaris pathology. The considerable difference observed in the location of PT and Mid-AT suggest possible isolated pathologies and differentials for Achilles tendon pain.

45 A. MANUAL THERAPY LUMBAR & GENERAL**Flexion distraction technique effective**

Complement Ther Med. 2019 Jun;44:61-67. doi: 10.1016/j.ctim.2019.02.012. Epub 2019 Mar 31.

Short-term effectiveness of the flexion-distraction technique in comparison with high-velocity vertebral manipulation in patients suffering from low-back pain.

Carrasco-Martínez F¹, Ibáñez-Vera AJ², Martínez-Amat A³, Hita-Contreras F³, Lomas-Vega R³.

OBJECTIVES:

To determine the short-term effects of a modified Flexion-Distraction (FD) technique in comparison with a high-velocity low-back spinal manipulation (HVLA-SM) protocol on patients suffering from chronic low-back pain (CLBP).

DESIGN AND METHODS:

A randomized controlled trial. The sample was composed of 150 patients suffering from CLBP, who were randomly assigned to either a FD (n = 75) or a HVLA-SM (n = 75) group. The variables used to study pain were the scores of the Visual Analogue Scale (VAS) and the Pressure Pain Threshold (PPT) on trigger points (TrPs) of the quadratus lumborum. In addition, the Oswestry Disability Index (ODI) was used to measure disability, and Schober's test and the Finger Floor Distance test (FFDT) to measure changes in low-back spine motion. An Analysis of Covariance (ANCOVA) was used to measure group effect, and Number Needed to Treat (NNT) for effect size.

RESULTS:

Greater improvements occurred in the FD group, with a statistically significant group effect ($p < 0.001$) for all outcome variables. The η^2 value was larger than 0.100 in the Schober's and FDD tests, larger than 0.200 in the case of ODI and PPT, and larger than 0.300 for VAS. OR = 0.07 [IC 95% = 0.03 to 0.18] and NNT = 2.08 [IC 95% = 1.64-2.84] yielded improved values for the FD group.

CONCLUSION:

For patients suffering from CLBP, greater improvements in pain and function were observed in the group receiving the modified FD treatment than in the HVLA-SM group.

45 D. MANUAL THERAPY EXTREMITIES**Hip mobilization with movement for PF pain**

J Sport Rehabil. 2019 May 29;1-26. doi: 10.1123/jsr.2018-0497.

Acute Effects of Hip Mobilization With Movement Technique on Pain and Biomechanics in Females With Patellofemoral Pain: A Randomized Placebo-Controlled Trial.

Nunes GS¹, Wolf DF¹, Santos DAD¹, de Noronha M², Serrão FV¹.

CONTEXT:

People with patellofemoral pain (PFP) present altered lower limb movements during some activities. Perhaps, joint misalignment in the hip is one of the reasons for altered movement patterns in people with PFP. Some mobilization techniques have been designed to address joint misalignments.

OBJECTIVE:

To investigate the acute effects of hip mobilization-with-movement (MWM) technique on pain and biomechanics during squats and jumps in females with and without PFP.

DESIGN:

Randomized placebo-controlled trial.

SETTING:

Movement analysis laboratory.

PATIENTS:

Fifty-six physically active females (28 with PFP and 28 asymptomatic) divided into four groups: PFP experimental and sham, and asymptomatic experimental and sham.

INTERVENTION(S):

The experimental groups received MWM for the hip and the sham groups received sham mobilization.

MAIN OUTCOME MEASURES:

Pain, trunk and lower limb kinematics, and hip and knee kinetics during single-leg squats and landings.

RESULTS:

After the interventions, no difference between groups was found for pain. The PFP experimental group decreased hip internal rotation during squats compared to the PFP sham group ($p=0.03$). There was no other significant difference between PFP groups for kinematic or kinetic outcomes during squats, as well as for any outcome during landings. There was no difference between asymptomatic groups for any of the outcomes in any of the tasks.

CONCLUSIONS:

Hip mobilization was ineffective to reduce pain in people with PFP. Hip MWM may contribute to dynamic lower limb realignment in females with PFP by decreasing hip internal rotation during squats. Therefore, hip MWM could be potentially useful as a complementary intervention for patients with PFP.

Muscle energy for elbow treatment

Hong Kong Physiother J. 2019 Jun;39(1):25-33. doi: 10.1142/S1013702519500033. Epub 2018 Oct 11.

Effects of muscle energy technique on pain, range of motion and function in patients with post-surgical elbow stiffness: A randomized controlled trial.

Faqih AI¹, Bedekar N², Shyam A³, Sancheti P⁴.

BACKGROUND:

Elbow is a very functional joint. Elbow stiffness is a significant cause of disability hampering the function of the upper extremity as a whole. Muscle Energy Techniques (METs) are relatively pain-free techniques used in clinical practice for restricted range of motion (ROM).

OBJECTIVE:

To study the effects of MET on pain, ROM and function given early in the rehabilitation in post-surgical elbow stiffness.

METHODS:

An RCT was conducted on 30 patients post elbow fracture fixation. Group 1 was given MET immediately post removal of immobilization while Group 2 received MET 1 week later along with the rehabilitation protocol. Pain (Visual Analogue Scale), ROM (goniometry) and function (Disability of Arm, Shoulder and Hand questionnaire) were assessed pre and post 3 weeks.

RESULTS:

Group 1 showed greater improvement than Group 2, mean flexion and extension change between groups being 11.7 ± 2.8 , 95%CI(5.9,17.4) and 8.5 ± 2.0 , 95%CI(4.4,12.7), respectively. VAS and DASH scores improved better in Group 1, mean change being 1.2 ± 0.2 , 95%CI(0.6,1.8) and 18.2 ± 2.2 , 95%CI(13.5,22.8) for VAS and DASH scores, respectively.

CONCLUSION:

MET can be used as an adjunct to the rehabilitation protocol to treat elbow stiffness and can be given safely in the early stages of post elbow fracture rehabilitation managed surgically with open reduction and rigid internal fixation.

49. STRETCHING**Isostretching for LBP**

Physiother Theory Pract. 2019 Jun 4:1-8. doi: 10.1080/09593985.2019.1625091

Influence of isostretching on patients with chronic low back pain. A randomized controlled trial.

Prado ÉRA¹, Meireles SM², Carvalho ACA¹, Mazoca MF¹, Motta Neto AM¹, Barboza Da Silva R¹, Trindade Filho EM³, Lombardi Júnior I⁴, Natour J².

Objective: This study investigated the influence of isostretching on patients with chronic low back pain.

Methods: It was a randomized, controlled trial with concealed allocation, intention-to-treat analysis, and blind assessment. Fifty-four patients with chronic low back pain were randomized to an experimental group and a control group. The experimental group performed isostretching twice a week for 45 days, while the control group remained on the waiting list for physical therapy. Patients were submitted to evaluations at baseline, after 20 and 45 days of treatment with regard to pain, quality of life, functional capacity, and satisfaction.

Results: The experimental group exhibited statistically significant improvements in comparison to the control group with regard to pain ($p = .003$), functional capacity ($p = .026$), patient satisfaction ($p < .001$), and quality of life as determined by the functional capacity ($p = .012$), physical aspects ($p = .011$) and pain ($p = .006$) subscales of the SF-36. The experimental group used a significantly lesser amount of pain medication than the control group ($p = .03$).

Conclusion: Isostretching was effective in reducing pain and in improving function, patient satisfaction and some aspects of quality of life in patients with chronic low back pain.

50 B. PNF**PNF and joint position sense**

J Sport Rehabil. 2019 May 16:1-30. doi: 10.1123/jsr.2018-0498.

The Effect of Proprioceptive Neuromuscular Facilitation on Joint Position Sense: A Systematic Review.

Takasaki H¹, Okubo Y², Okuyama S¹.

CONTEXT:

Accurate joint position sense (JPS) is necessary for effective motor learning and high performance in activities that require fine motor control. Proprioceptive Neuromuscular Facilitation (PNF) can be a promising intervention.

OBJECTIVES:

The current study aimed to examine existing peer-reviewed original studies that have investigated the effect of PNF techniques on the JPS in terms of the methodological quality, PNF techniques, outcomes, and participant characteristics.

EVIDENCE ACQUISITION:

A systematic literature search was performed using PubMed, Embase, Medline, CINAHL, SocINDEX, Scopus, and Cochrane library from inception to January 2018. The following inclusion criteria were used: 1) assessment of the JPS, 2) peer-reviewed original studies with a RCT or quasi-RCT design, 3) participants with musculoskeletal disorders or healthy individuals (i.e., neither animal studies nor those involving neurological problems), and 4) no co-intervention with PNF, except for warm-up procedures. The methodological quality was assessed using PEDro scale and five additional criteria. Effect size η^2 was calculated where a positive value indicated an increased JPS after PNF as compared with other approaches including the wait-and-see method.

EVIDENCE SYNTHESIS:

Nine studies were examined for their methodological quality and only one study scored > 6 on the PEDro scale. Positive and large effect size ($\eta^2 > 0.14$) were detected in two studies where JPS of the knee with contract-relax and replication techniques were assessed in healthy individuals. However, the methodological quality of these studies was poor (PEDro scores of 3 and ≤ 5 in the total quality score out of 16, respectively).

CONCLUSIONS:

The current study did not find multiple studies with high-methodological quality and similar PNF techniques, outcomes and characteristics of participants. More high-quality studies are required to achieve a comprehensive understanding of the effect of PNF on the JPS.

52. EXERCISE

Pilates and LBP

Braz J Phys Ther. 2019 May 16. pii: S1413-3555(18)30601-4. doi: 10.1016/j.bjpt.2019.05.001.

Different weekly frequencies of Pilates did not accelerate pain improvement in patients with chronic low back pain.

Silva MLD¹, Miyamoto GC², Franco KFM¹, Franco YRDS¹, Cabral CMN¹.

BACKGROUND:

Recent evidence recommends Pilates for the treatment of chronic low back pain. However, it is still unknown if different weekly frequencies of Pilates can accelerate the improvement of symptoms in patients with chronic low back pain verified by a daily pain assessment.

OBJECTIVE:

To analyze whether different weekly frequencies of Pilates can accelerate pain reduction by 30%, 50%, and 100% in patients with non-specific chronic low back pain and the necessary number of weeks to reach these improvements.

METHODS:

Two hundred and twenty-two patients were randomized into three groups: Pilates group 1 received treatment once a week, Pilates group 2 received treatment twice a week, and Pilates group 3 received treatment three times a week. All groups received Pilates for six weeks. Pain intensity was measured daily before and after each intervention session using the Pain Numerical Rating Scale. The assessor was not blind.

RESULTS:

The survival analysis showed that all Pilates groups had a pain reduction of 30%, 50%, and 100% at the same speed during treatment. There was no difference between the different weekly frequencies of Pilates for any of the comparisons ($p>0.05$). After the first week of treatment, 44.6% of the patients in Pilates group 3 showed complete pain improvement, followed by 37.8% of the patients in Pilates group 2 and 29.7% in Pilates group 1. After the last week, 71.6% (Pilates group 1), 77% (Pilates group 2), and 78.4% (Pilates group 3) of the patients reported complete improvement of symptoms.

CONCLUSION:

Different weekly frequencies of Pilates did not accelerate pain improvement in patients with non-specific chronic low back pain. Registered in Clinical Trials Registry: NCT02241538 (<https://clinicaltrials.gov/ct2/show/NCT02241538>).

Planks and dorsi flexion

J Strength Cond Res. 2019 May 24. doi: 10.1519/JSC.0000000000003188.

Comparison of Trunk Muscle Activity Between Traditional Plank Exercise and Plank Exercise With Isometric Contraction of Ankle Muscles in Subjects With Chronic Low Back Pain.

Choi JH^{1,2}, Kim DE^{3,2}, Cynn HS².

Choi, JH, Kim, DE, and Cynn, HS. Comparison of trunk muscle activity between traditional plank exercise and plank exercise with isometric contraction of ankle muscles in subjects with chronic low back pain. J Strength Cond Res XX(X): 000-000, 2019-

This study aimed to compare the effects of 4 different ankle conditions on the activities of rectus abdominis (RA), external oblique (EO), transversus abdominis/internal oblique (TrA/IO), and erector spinae (ES) muscles during plank exercise in subjects with chronic low back pain (CLBP).

Twenty-two subjects with CLBP participated in this study. The subjects performed the traditional plank and plank with 3 different ankle muscle contraction types (isometric contraction of ankle dorsiflexor, plantarflexor, and without ankle muscle contraction). Surface electromyography was used to measure the activities of RA, EO, TrA/IO, ES, tibialis anterior, and gastrocnemius muscles. A 1-way repeated-measures analysis of variance was used to assess the statistical significance of activities of the RA, EO, TrA/IO, and ES muscles.

The activities of RA, EO, and TrA/IO muscles were significantly greater in the plank with isometric contraction of ankle dorsiflexor (PlankDF) than in the other 3 plank exercises. No significant difference in the activity of ES muscles was revealed during the 4 plank exercises. The activities of all abdominal muscles during PlankDF were significantly higher than those during the traditional plank, as well as during the plank with isometric contraction of ankle plantarflexor (PlankPF) and the plank without ankle muscular contraction (Plankw/o), and more than 60% of maximal voluntary isometric contraction was observed.

Thus, PlankDF could be applied not only as a rehabilitation strategy for patients with decreased core stability owing to weakness of abdominal muscles but also as fitness program for improving core strength.

High intensity exercise improves some lumbar muscular status

BMC Musculoskelet Disord. 2019 Jun 18;20(1):290. doi: 10.1186/s12891-019-2658-1.

The effect of high-intensity resistance exercise on lumbar musculature in patients with low back pain: a preliminary study.

Berry DB^{1,2}, Padwal J³, Johnson S⁴, Englund EK⁴, Ward SR^{1,4,5}, Shahidi B⁶.

BACKGROUND:

Muscle atrophy and fatty infiltration of the lumbar extensors is associated with LBP. Exercise-based rehabilitation targets strengthening these muscles, but few studies show consistent changes in muscle quality with standard-of-care rehabilitation. The goal of this study was to assess the effect of high-intensity resistance exercise on lumbar extensor muscle size (cross sectional area) and quality (fat fraction) in individuals with low back pain (LBP).

METHODS:

Fourteen patients with LBP were recruited from a local rehabilitation clinic. Patients underwent MRI scanning before and after a standardized 10-week high-intensity machine-based, resistance exercise program. Patient pain, disability, anxiety/depression, satisfaction, strength, and range of motion was compared pre- and post-rehabilitation using analysis of covariance (covariates: age, gender). Exercise-induced changes in MRI, and patient functional outcome measures were correlated using Pearson's correlation test.

RESULTS:

No significant differences were found in muscle size or fatty infiltration of the lumbar extensors over the course of rehabilitation ($p > 0.31$). However, patients reported reduced pain ($p = 0.002$) and were stronger ($p = 0.03$) at the conclusion of the program. Improvements in muscle size and quality for both multifidus and erector spinae correlated with improvements in disability, anxiety/depression, and strength.

CONCLUSION:

While average muscle size and fatty infiltration levels did not change with high-intensity exercise, the results suggest that a subgroup of patients who demonstrate improvements in muscle health demonstrate the largest functional improvements. Future research is needed to identify which patients are most likely to respond to this type of treatment.

Physical activity and improved life expectancy

BMC Med. 2019 Jun 12;17(1):108. doi: 10.1186/s12916-019-1339-0.

Physical activity, multimorbidity, and life expectancy: a UK Biobank longitudinal study.

Chudasama YV^{1,2}, Khunti KK^{3,4}, Zaccardi F³, Rowlands AV^{3,5,6}, Yates T^{3,5}, Gillies CL³, Davies MJ^{3,5}, Dhalwani NN^{3,4,7}.

BACKGROUND:

Multimorbidity is an emerging public health priority. Physical activity (PA) is recommended as one of the main lifestyle behaviours, yet the benefits of PA for people with multimorbidity are unclear. We assessed the benefits of PA on mortality and life expectancy in people with and without multimorbidity.

METHODS:

Using the UK Biobank dataset, we extracted data on 36 chronic conditions and defined multimorbidity as (a) 2 or more conditions, (b) 2 or more conditions combined with self-reported overall health, and (c) 2 or more top-10 most common comorbidities. Leisure-time PA (LTPA) and total PA (TPA) were measured by questionnaire and categorised as low (< 600 metabolic equivalent (MET)-min/week), moderate (600 to < 3000 MET-min/week), and high (\geq 3000 MET-min/week), while objectively assessed PA was assessed by wrist-worn accelerometer and categorised as low (4 min/day), moderate (10 min/day), and high (22 min/day) walking at brisk pace. Survival models were applied to calculate adjusted hazard ratios (HRs) and predict life expectancy differences.

RESULTS:

491,939 individuals (96,622 with 2 or more conditions) had a median follow-up of 7.0 (IQR 6.3-7.6) years. Compared to low LTPA, for participants with multimorbidity, HR for mortality was 0.75 (95% CI 0.70-0.80) and 0.65 (0.56-0.75) in moderate and high LTPA groups, respectively. This finding was consistent when using TPA measures. Using objective PA, HRs were 0.49 (0.29-0.80) and 0.29 (0.13-0.61) in the moderate and high PA groups, respectively. These findings were similar for participants without multimorbidity. In participants with multimorbidity, at the age of 45 years, moderate and high LTPA were associated with an average of 3.12 (95% CI 2.53, 3.71) and 3.55 (2.34, 4.77) additional life years, respectively, compared to low LTPA; in participants without multimorbidity, corresponding figures were 1.95 (1.59, 2.31) and 1.85 (1.19, 2.50). Similar results were found with TPA. For objective PA, moderate and high levels were associated with 3.60 (-0.60, 7.79) and 5.32 (-0.47, 11.11) life years gained compared to low PA for those with multimorbidity and 3.88 (1.79, 6.00) and 4.51 (2.15, 6.88) life years gained in those without. Results were consistent when using other definitions of multimorbidity.

CONCLUSIONS:

There was an inverse dose-response association between PA and mortality. A moderate exercise is associated with a longer life expectancy, also in individuals with multimorbidity.

61. FIBROMYALGIA

Vibration helps

Testing the effects of gentle vibrotactile stimulation on symptom relief in fibromyalgia

- Jesus Pujol Daniel Ramos-López, Laura Blanco-Hinojo, Guillem Pujol, Héctor Ortiz,
- Gerard Martínez-Vilavella, Josep Blanch, Jordi Monfort and Joan Deus

Arthritis Research & Therapy 2019 **21**:148
<https://doi.org/10.1186/s13075-019-1932-9>
Background

Sensory disturbances in fibromyalgia extend beyond nociception. It has been proposed that imbalance in the mutual competition between painful input and non-painful sensory activity may, to a significant extent, account for the augmented subjective perception of pain. In this context, non-nociceptive somatosensory stimulation could arguably attenuate fibromyalgia symptoms by restoring the sensory balance. We specifically tested the effect of vibrotactile stimulation on symptom relief in fibromyalgia patients with a randomized, double-blind, sham-controlled, crossover clinical trial.

Methods

Seventy-seven female patients were randomized and data from 63 valid cases were analyzed. Active intervention involved extensive body stimulation with gentle mechanical vibrations administered during 3 h at night for 3 weeks, and the placebo effect was controlled using identical instruments to simulate an alternative treatment option. The primary outcome measure combined pain, fatigue, and complaints of poor cognition.

Results

Vibrotactile stimulation was significantly superior to sham in alleviating fibromyalgia symptoms globally. However, univariate analyses showed that the effect was not universal. Benefits were perceived on unpleasant somatic sensations such as generalized pain and fatigue, but not on poor cognition, anxiety, and depression. Vibrotactile stimulation was notably well tolerated and sleep quality significantly improved despite the fact that vibrations were administered at night.

Conclusions

Results thus provide new evidence that non-nociceptive somatosensory stimulation may favorably act upon altered somatosensory balance in fibromyalgia. From a clinical perspective, both the degree of improvement and the easy application of our proposal would seem to support a potential role for vibrotactile stimulation in the symptomatic treatment of fibromyalgia.

62 A. NUTRITION/VITAMINS**Vit D and parathyroid hormone**

Original Article

Effect of Vitamin D Supplementation on Total and Free 25 Hydroxyvitamin D and Parathyroid Hormone. An Analysis of Two Randomized Controlled Trials

Lynette M. Smith J Christopher Gallagher

<https://doi.org/10.1111/joim.12950>

Background

It is questionable as to whether total serum 25 hydroxyvitamin D (T25D) levels are lower in African Americans. We measured serum T25D, free 25hydroxyvitamin D (F25D), and serum parathyroid hormone (PTH) in African American and Caucasian women and studied the effect of vitamin D dosing to determine if differences by race or age occur.

Methods

Healthy young and older Caucasian and African American women who were vitamin D insufficient were randomized in two clinical trials to escalating daily doses of vitamin D from 400 IU - 4800IU and placebo for 12 months.

Results

Baseline F25D and T25D were significantly lower in young but not older African American compared to Caucasian women. At baseline the rate of change in F25D with T25D was significantly greater in younger women than in older women, but difference in the rate of change in F25D with T25D is similar in African American and Caucasian women.

After vitamin D supplementation there was an increase in F25D, and the dose response was not significantly different by age or race. The ratio of F25D/T25D decreased in all groups once T25D exceeded ~ 60nmol/L. There was a progressive decrease in serum PTH with increasing vitamin D doses and the percent change was similar for F25D and T25D.

Conclusion

Serum F25D and T25D are lower in younger African American women and since dietary vitamin D is similar in the groups, it is likely that the cause of low serum 25OHD in African American women is due to reduced UV exposure and reduced skin production of vitamin D.

Fruits and Vegi's

Intake of Vegetables and Fruits Through Young Adulthood Is Associated with Better Cognitive Function in Midlife in the US General Population

Xuanxia Mao Cheng Chen Pengcheng Xun Martha L Daviglus Lyn M Steffen David R Jacobs, Jr. Linda Van Horn Stephen Sidney Na Zhu Bo Qin ... Show more

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Background

Vegetables and fruits (VF) may differentially affect cognitive functions, presumably due to their various nutrient contents, but evidence from epidemiologic studies is limited.

Objectives

The aim of this study was to examine the long-term association between VF intakes, including VF subgroups, in young adulthood and cognitive function in midlife.

Methods

A biracial cohort of 3231 men and women aged 18–30 y at baseline in 1985–1986 were followed up for 25 y in the Coronary Artery Risk Development in Young Adults Study. Diet was measured at baseline, and in examination years 7 and 20. Cognitive function was assessed at examination year 25 through the use of 3 tests: the Rey Auditory Verbal Learning Test (RAVLT), the Digit Symbol Substitution Test (DSST), and the Stroop test. The mean differences (MDs) with 95% CIs in cognitive scores across intake categories were estimated through the use of the multivariable-adjusted general linear regression model.

Results

Excluding potatoes, intake of whole vegetables was significantly associated with a better cognitive performance after adjustment for potential confounders in all 3 cognitive tests (quintile 5 compared with quintile 1—RAVLT, MD: 0.33; 95% CI: 0.01, 0.64; *P*-trend = 0.08; DSST, MD: 2.84; 95% CI: 0.93, 4.75; *P*-trend < 0.01; Stroop test, MD: -2.87; 95% CI: -4.24, -1.50; *P*-trend < 0.01]. Similarly, intake of fruits, except fruit juices, was significantly related to a better cognitive performance (quintile 5 compared with quintile 1—DSST, MD: 2.41; 95% CI: 0.70, 4.12; *P*-trend = 0.03).

Conclusions

This study supports the long-term benefits of VF consumption on cognitive performance, except those VF with relatively low fiber content such as potatoes and fruit juices, among the middle-aged US general population.

65. NEUROLOGICAL CONDITIONS

Mortality in CP

Survival and mortality in cerebral palsy: Observations to the sixth decade from a data linkage study of a total population register and National Death Index

BMC Neurology — Blair E, et al. | June 07, 2019

Using survival analysis method, researchers characterized survival and mortality trends up to the sixth century in a geographically defined population of individuals with stratified cerebral palsy (CP) based on the clinical description of their early childhood impairments.

Of the 3185 eligible individuals, 436 (13.7%) died. For 22% of the CP population with the mildest impairments, the length of survival to 58 years does not differ significantly from that of the population, but with increasingly severe impairments, as expected, the standardised mortality ratio increases.

However, over 80% have a life expectancy beyond 58 years and longer follow-up of population-based samples with detailed descriptions of impairments is suggested in order to obtain a more complete picture of CP survival. Mortality has tended to change from infancy to early adulthood for those with severe CP in Western Australia since 1990.