

## 2. LBP

### Walking helps

Musculoskelet Sci Pract. 2018 Apr;34:38-46. doi: 10.1016/j.msksp.2017.12.003. Epub 2017 Dec 12.

#### **The effects of walking intervention in patients with chronic low back pain: A meta-analysis of randomized controlled trials.**

Sitthipornvorakul E<sup>1</sup>, Klinsophon T<sup>2</sup>, Sihawong R<sup>2</sup>, Janwantanakul P<sup>3</sup>.

##### *OBJECTIVE:*

The aim of this meta-analysis of randomized controlled trials was to gain insight into the effectiveness of walking intervention on pain, disability, and quality of life in patients with chronic low back pain (LBP) at post intervention and follow ups.

##### *METHOD:*

Six electronic databases (PubMed, Science Direct, Web of Science, Scopus, PEDro and The Cochrane library) were searched from 1980 to October 2017. The following keywords were used: Walk\* or Pedometer\* or Accelerometer\* or Treadmill\* paired with "Back pain", "Low back pain", "Chronic low back pain", "LBP", or "Backache". Randomized controlled trials in patients with chronic LBP were included if they compared the effects of walking intervention to non-pharmacological interventions. Pain, disability, and quality of life were the primary health outcomes.

##### *RESULTS:*

Nine studies were suitable for meta-analysis. Data was analyzed according to the duration of follow-up (short-term, < 3 months; intermediate-term, between 3 and 12 months; long-term, > 12 months). Low- to moderate-quality evidence suggests that walking intervention in patients with chronic LBP was as effective as other non-pharmacological interventions on pain and disability reduction in both short- and intermediate-term follow ups.

##### *CONCLUSIONS:*

Unless supplementary high-quality studies provide different evidence, walking, which is easy to perform and highly accessible, can be recommended in the management of chronic LBP to reduce pain and disability.

**Vit. D and LBP**

Clin Rheumatol. 2018 May;37(5):1367-1374. doi: 10.1007/s10067-017-3798-z. Epub 2017 Aug 25.

**Prevalence of vitamin D deficiency in chronic and subacute low back pain patients in India: a triple-arm controlled study.**

Panwar A<sup>1</sup>, Valupadas C<sup>2</sup>, Veeramalla M<sup>3</sup>, Vishwas HN<sup>4</sup>.

Vitamin D is vital for musculoskeletal health and may be associated with subacute and chronic low back pain.

The objective of this study was to estimate the prevalence of vitamin D deficiency among chronic low back pain (CLBP) and subacute low back pain (SLBP), and compare the same with healthy controls. This study was designed as triple-arm case-control study comprising of CLBP, SLBP, and controls. SLBP and CLBP cases were consecutively enrolled over 3 months of winter season from November 2016 to January 2017. Serum 25- (OH) vitamin D was estimated for the study subjects and categorical comparison of severity of vitamin D deficiency was done for the cases and controls. A total of 250 CLBP, 177 SLBP cases, and 248 controls were included in the study. Mean ( $\pm$  SD) serum vitamin D levels among CLBP, SLBP, and controls were 20.36 ( $\pm$  12.56), 21.42 ( $\pm$  13.20), and 20.84 ( $\pm$  6.93) ng/ml respectively, the difference being statistically insignificant.

There was no significant difference in the prevalence of vitamin D deficiency among CLBP, SLBP, and controls which was 53.6, 50.8, and 51.6% respectively, in the three arms. However, the categorical analysis revealed that CLBP and SLBP cases had a significantly higher prevalence of worse categories of vitamin D deficiency. Cases had significantly larger frequency (CLBP vs. controls, 43.6 vs 20.1%,  $P < 0.001$ ; SLBP vs. controls, 43.5 vs 20.1%,  $P = 0.001$ ) of individuals with vitamin D levels  $\leq 16$  ng/ml (moderate deficiency upper threshold level). Thus, the severe forms of vitamin D deficiency may be causally associated with CLBP and SLBP. The results of the present study revealed that increasing severity of vitamin D deficiency may have a pathogenetic association with chronic low back pain and subacute low back pain.

These results may prove to be of significance in framing of future management guidelines for the above clinical conditions.

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Prolapse

NeuroUrol Urodyn. 2018 Apr 10. doi: 10.1002/nau.23587

#### **Bowel function, sexual function, and symptoms of pelvic organ prolapse in women with and without urinary incontinence.**

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#### *AIMS:*

Bowel symptoms, pelvic organ prolapse, and sexual dysfunction are common, but their frequency among women with lower urinary tract symptoms (LUTS) has not been well described. Our aims were to describe pelvic floor symptoms among women with and without urinary incontinence (UI) and among subtypes of UI.

#### *METHODS:*

Women with LUTS seeking care at six U.S. tertiary care centers enrolled in prospective cohort study were studied. At baseline, participants completed the Pelvic Floor Distress Inventory (PFDI-20), Pelvic Organ Prolapse/Incontinence Sexual Questionnaire (PISQ-IR), and PROMIS GI Diarrhea, Constipation, and Fecal Incontinence Scales.

#### *RESULTS:*

Mean age among the 510 women was 56.4 ± 14.4 years. Women who reported UI (n = 420) had more diarrhea and constipation symptoms (mean scores 49.5 vs 46.2 [P = 0.01] and 51.9 vs 48.4 [P < 0.01], respectively) at baseline. Among sexually active women, mean PISQ-IR subscale scores were lower among those with UI (condition specific: 89.8 vs 96.7, P < 0.01; condition impact: 79.8 vs 92.5, P < 0.01). Women with mixed urinary incontinence (MUI) (n = 240) reported more prolapse symptoms, fecal incontinence, and worse sexual function compared to those with stress urinary incontinence (SUI) and urgency urinary incontinence (UUI).

#### *CONCLUSIONS:*

Women presenting with LUTS with UI reported significantly worse constipation, diarrhea, fecal incontinence, and sexual function compared to women without UI. In women with UI, sexual function and pelvic organ prolapse (POP) symptoms were worse in those with MUI compared to SUI and UUI.

**CV risk increases after hysterectomy**

Menopause. 2018 May;25(5):483-492. doi: 10.1097/GME.0000000000001043.

**Cardiovascular and metabolic morbidity after hysterectomy with ovarian conservation: a cohort study.**

Laughlin-Tommaso SK<sup>1,2</sup>, Khan Z<sup>3</sup>, Weaver AL<sup>4</sup>, Smith CY<sup>4</sup>, Rocca WA<sup>5,6,7</sup>, Stewart EA<sup>2,3,7</sup>.

*OBJECTIVE:*

The aim of the study was to determine the long-term risk of cardiovascular disease and metabolic conditions in women undergoing hysterectomy with bilateral ovarian conservation compared with age-matched referent women.

*METHODS:*

Using the Rochester Epidemiology Project records-linkage system, we identified 2,094 women who underwent hysterectomy with ovarian conservation for benign indications between 1980 and 2002 in Olmsted County, Minnesota. Each woman was age-matched ( $\pm 1$  y) to a referent woman residing in the same county who had not undergone prior hysterectomy or any oophorectomy. These two cohorts were followed historically to identify de novo cardiovascular or metabolic diagnoses. We estimated hazard ratios (HRs) and 95% CIs using Cox proportional hazards models adjusted for 20 preexisting chronic conditions and other potential confounders. We also calculated absolute risk increases and reductions from Kaplan-Meier estimates.

*RESULTS:*

Over a median follow-up of 21.9 years, women who underwent hysterectomy experienced increased risks of de novo hyperlipidemia (HR 1.14; 95% CI, 1.05-1.25), hypertension (HR 1.13; 95% CI, 1.03-1.25), obesity (HR 1.18; 95% CI, 1.04-1.35), cardiac arrhythmias (HR 1.17; 95% CI, 1.05-1.32), and coronary artery disease (HR 1.33; 95% CI, 1.12-1.58). Women who underwent hysterectomy at age  $\leq 35$  years had a 4.6-fold increased risk of congestive heart failure and a 2.5-fold increased risk of coronary artery disease.

*CONCLUSIONS:*

Even with ovarian conservation, hysterectomy is associated with an increased long-term risk of cardiovascular and metabolic conditions, especially in women who undergo hysterectomy at age  $\leq 35$  years. If these associations are causal, alternatives to hysterectomy should be considered to treat benign gynecologic conditions.

**Breast CA risk**

Int J Cancer. 2018 Mar 23. doi: 10.1002/ijc.31394.

**Adiposity and breast cancer risk in postmenopausal women: Results from the UK Biobank prospective cohort.**

Guo W<sup>1</sup>, Key TJ<sup>1</sup>, Reeves GK<sup>1</sup>.

Body size is an important modifiable risk factor for postmenopausal breast cancer. However, it remains unclear whether direct measures of fat mass are better indicators of risk than anthropometric measures, or whether central adiposity may contribute to risk beyond overall adiposity.

We analyzed data from 162,691 postmenopausal women in UK Biobank followed from 2006 to 2014. Body size was measured by trained technicians. Multivariable-adjusted Cox regression was used to estimate relative risks. Analyses were stratified by age at recruitment, region and socioeconomic status, and adjusted for family history of breast cancer, age at menarche, age at first birth, parity, age at menopause, previous hormone replacement therapy use, smoking, alcohol intake, height, physical activity and ethnicity. We observed 2,913 incident invasive breast cancers during a mean 5.7 years of follow-up. There was a continuous increase in risk of postmenopausal breast cancer with increasing adiposity, across all measures. The point estimate, comparing women in the top (median 37.6 kg) to bottom (median 17.6 kg) quartile of body fat mass was 1.70 (95% confidence interval 1.52-1.90). The magnitudes of the associations between per SD increase in BMI and body fat mass with breast cancer risk were similar, suggesting impedance measures of fat were not substantially better indicators of risk than anthropometric measures. After adjusting for body fat mass, the associations between anthropometric measures of central adiposity and breast cancer risk were attenuated.

The magnitude of risk, across all measures of adiposity, was greater in women who had been postmenopausal for 12 or more years.

## 8. VISCERA

### IBS and joint hypermobility

Neurogastroenterol Motil. 2018 Apr 23:e13353. doi: 10.1111/nmo.13353.

#### **Higher prevalence of joint hypermobility in constipation predominant irritable bowel syndrome.**

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##### *BACKGROUND:*

Joint hypermobility syndrome (JHS) is characterized by excessive connective tissue laxity manifest as joint hypermobility (JH) together with musculoskeletal symptoms. Previous studies have shown an association between JH/JHS and gastrointestinal symptoms, including irritable bowel syndrome (IBS), although its association with specific IBS subtypes is incompletely understood. We aimed to determine the prevalence of JH according to the subtypes of IBS, in particular IBS-C and IBS-D.

##### *METHODS:*

Data of 228 consecutive IBS patients were analyzed. IBS was subtyped into constipation and diarrhea predominant IBS (IBS-C and IBS-D), IBS with mixed bowel habits (IBS-M) and unsubtyped IBS (IBS-U). JH was defined as a Beighton Score  $\geq 4/9$  points and JHS diagnosed according to revised Brighton Criteria. Data of IBS patients were analyzed for psychological comorbidities assessed by Hospital Anxiety and Depression Scale (HADS) and Visceral Sensitivity Index (VSI).

##### *KEY RESULTS:*

Of 228 IBS patients, 64 (28.1%) suffered from IBS-C, 89 (39.0%) from IBS-D, 48 (21.1%) from IBS-M, and 27 (11.8%) from IBS-U. JH was diagnosed in 95 patients (41.7%). The prevalence of JH was significantly higher in IBS-C than IBS-D (57.8% vs 34.8%,  $P = .031$ ). There was no significant difference in VSI and HADS according to JH or IBS subtype.

##### *CONCLUSIONS AND INTERFERENCES:*

The prevalence of JH was significantly higher in IBS-C compared to IBS-D. Abnormalities in the connective tissue biomechanics in those with JH may contribute to a degree of colonic inertia which could result in constipation in JH-positive IBS patients. Further work is needed to determine the colonic biomechanics in patients with JH.

**Lifestyle factors in diverticulitis**

Clin Gastroenterol Hepatol. 2018 Apr 11. pii: S1542-3565(18)30342-2. doi: 10.1016/j.cgh.2018.04.006

**Lifestyle Factors in Late Adolescence Associate With Later Development of Diverticular Disease Requiring Hospitalization.**

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*BACKGROUND & AIMS:*

The burden of diverticular disease on society is high and is increasing with an aging population. It is therefore important to identify risk factors for disease development or progression. Many lifestyle behaviors during adolescence affect risk for later disease. We searched for adolescent lifestyle factors that affect risk of diverticular disease later in life.

*METHODS:*

We performed a retrospective analysis of data from 43,772 men (18-20 years old) conscripted to military service in Sweden from 1969 through 1970, with a follow-up period of 39 years. All conscripts underwent an extensive mental and physical health examination and completed questionnaires covering alcohol consumption, smoking, and use of recreational drugs; cardiovascular fitness was assessed using an ergometer cycle at the time of conscription. Outcome data were collected from national registers to identify discharge diagnoses of diverticular disease until the end of 2009. We performed Cox regression analysis to determine whether body mass index, cardiovascular fitness, smoking, use of recreational drugs, alcohol consumption, and risky use of alcohol, at time of conscription are independent risk factors for development of diverticular disease.

*RESULTS:*

Overweight and obese men had a 2-fold increased risk of diverticular disease compared to normal-weight men (hazard ratio= 2.00; P<.001). A high level of cardiovascular fitness was associated with a reduced risk of diverticular disease requiring hospitalization (P=.009). Smoking (P=.003), but not use of recreational drugs (P=.11), was associated with an increased risk of diverticular disease requiring hospitalization. Risky use of alcohol, but not alcohol consumption per se, was associated with a 43% increase in risk of diverticular disease requiring hospitalization (P=.007).

*CONCLUSION:*

In a retrospective analysis of data from 43,772 men in Sweden, we associated being overweight or obese, a smoker, a high-risk user of alcohol, and/or having a low level of cardiovascular fitness in late adolescence with an increased risk of developing diverticular disease requiring hospitalization later in life. Improving lifestyle factors among adolescents might reduce the economic burden of diverticular disease decades later.

### Antibodies and CD

#### **Antibody concentrations decrease 14-fold in children with celiac disease on a gluten-free diet but remain high at 3 months**

Clinical Gastroenterology and Hepatology — | April 27, 2018

Petroff D, et al.

The target of the researchers was to gauge the concentrations of immunoglobulin A (IgA) against tissue transglutaminase (IgA-TTG) in children with celiac disease, placed on a gluten-free diet (GFD). Eligible candidates included pediatric patients (mean age, 8.4 years) who underwent duodenal biopsy to confirm or refute celiac disease from October 2012 through December 2015. A notable decrease was found in the serum concentration of IgA-TTG in most children with celiac disease within 3 months after they were placed on a GFD. Nonetheless, it did not normalize in most. Yielded data could aid in analyzing the patient response to the diet at short-term follow-up evaluations.

It was deduced that subjects with a significant response to a GFD displayed persistently high antibody levels after 3 months.



**10 B. CERVICAL EXERCISES****Axial Elongation**

Physiother Res Int. 2018 Mar 14. doi: 10.1002/pri.1712.

**Cervical flexor muscle training reduces pain, anxiety, and depression levels in patients with chronic neck pain by a clinically important amount: A prospective cohort study.**

Nazari G<sup>1</sup>, Bobos P<sup>1,2</sup>, Billis E<sup>3</sup>, MacDermid JC<sup>1,2</sup>.

*BACKGROUND AND PURPOSE:*

Neck pain is the fourth leading cause of disability in the United States and exerts an important socio-economic burden around the world. The aims of this study were to determine the effectiveness of deep and superficial flexor muscle training in addition to home-based exercises in reducing chronic neck pain and anxiety/depression levels.

*METHODS:*

This was a prospective cohort study. Patients between 18 and 65 years old with chronic neck pain were eligible to participate if they had disability levels at least 5 out of 50 on the Neck Disability Index. Patients were divided into three groups: Group A received deep neck flexor and home-based exercises; Group B received superficial muscle and home-based exercises; and Group C received home-based exercises only. The Numeric Pain Rating Scale (NPRS), Neck Disability Index, and Hospital Anxiety and Depression Scale were administered at baseline and 7 weeks later.

*RESULTS:*

The highest improvements in pain intensity levels were observed in Group A with 4.75 (1.74) NPRS points, and the lowest were in Group C with 1.00 (1.10). The highest reductions in anxiety and depression levels were noted in Group A (2.80) and Group B (1.65), respectively. The highest improvements in pain intensity levels were observed among Groups A versus C with 2.80 (0.52) NPRS. The highest reductions in anxiety and depression levels were noted among Groups A versus C with 1.75 (1.10) points and Groups B versus C with 1.60 (0.90) points, respectively.

*CONCLUSIONS:*

Deep and superficial flexor muscle training along with home-based exercises is likely to reduce chronic neck pain and anxiety/depression levels by a clinically relevant amount. Future larger scaled randomized controlled trials are warranted to further support these findings.

**13 B. TMJ/ORAL****Tea improves oral bacteria**

Cancer Epidemiol Biomarkers Prev. 2018 Apr 27. pii: cebp.0184.2018. doi: 10.1158/1055-9965.EPI-18-0184.

**Association of coffee and tea intake with the oral microbiome: results from a large cross-sectional study.**

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**BACKGROUND:**

The oral microbiota play a central role in oral health, and possibly in carcinogenesis. Research suggests coffee and tea consumption may have beneficial health effects. We examined the associations of these common beverages with the oral ecosystem in a large cross-sectional study.

**METHODS:**

We assessed oral microbiota in mouthwash samples from 938 participants in two U.S. cohorts using 16S rRNA gene sequencing. Coffee and tea intake were assessed from food frequency questionnaires. We examined associations of coffee and tea intake with overall oral microbiota diversity and composition using linear regression and permutational MANOVA, respectively, and with taxon abundance using negative binomial generalized linear models; all models adjusted for age, sex, cohort, BMI, smoking, ethanol intake, and energy intake.

**RESULTS:**

Higher tea intake was associated with greater oral microbiota richness (P=0.05) and diversity (P=0.006), and shifts in overall community composition (P=0.002); coffee was not associated with these microbiome parameters. Tea intake was associated with altered abundance of several oral taxa; these included Fusobacteriales, Clostridiales, and Shuttleworthia satelles (higher with increasing tea) and Bifidobacteriaceae, Bergeyella, Lactobacillales, and Kingella oralis (lower with increasing tea). Higher coffee intake was only associated with greater abundance of Granulicatella and Synergistetes.

**CONCLUSIONS:**

In the largest study to date of tea and coffee consumption in relation to the oral microbiota, the microbiota of tea drinkers differed in several ways from non-drinkers.

**IMPACT:**

Tea-driven changes to the oral microbiome may contribute to previously observed associations between tea and oral and systemic diseases, including cancers.

**13 C. AIRWAYS/SWALLOWING/SPEECH****Phrenic nerve stim helps sleep apnea**

The American Journal of Cardiology

**Sustained Twelve Month Benefit of Phrenic Nerve Stimulation for Central Sleep Apnea**

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<https://doi.org/10.1016/j.amjcard.2018.02.022>

Transvenous phrenic nerve stimulation improved sleep metrics and quality of life, and reduced sleepiness after 6-months versus control in the **remedē**<sup>®</sup>

System Pivotal Trial. Sustainability of effectiveness beyond 6-months has not been reported. This analysis explored the effectiveness of phrenic nerve stimulation in patients with central sleep apnea after 12-months of therapy. Reproducibility of the treatment effect was assessed in the former control group in whom the implanted device was initially inactive for the 6-month effectiveness endpoint evaluation and subsequently activated when the randomized control assessments were complete. Patients with moderate to severe central sleep apnea were implanted with the phrenic nerve stimulation system and randomized to therapy activation at 1-month (treatment) or after the 6-month primary endpoint assessment (control). Sleep indices were assessed from baseline to 12-months in the treatment group and from 6 to 12-months in the former control. In the treatment group, a  $\geq 50\%$  reduction in apnea hypopnea index occurred in 60% [35/58] (95% CI 47% to 64%) of patients at 6-months and 67% [36/54] (95% CI 53% to 78%) at 12-months. After 6-months of therapy, 55% (36/65) (95% CI 43%, 67%) of the former control group achieved  $\geq 50\%$  reduction in apnea hypopnea index. Patient Global Assessment (PGA) was markedly or moderately improved at 6 and 12 months in 60% of treatment patients. Improvements in all sleep indices and PGA persisted at 12-months. A serious adverse event within 12 months occurred in 13/151 (9%) patients.

In conclusion, phrenic nerve stimulation produced sustained improvements in sleep indices and quality of life to at least 12-months in patients with central sleep apnea. The similar improvement of the former control group after 6-months of active therapy confirms that the benefits of phrenic nerve stimulation are reproducible and reliable.

**20 A. ROTATOR CUFF****Tests****RESEARCH REPORT****Validity and Responsiveness of the Short Version of the Western Ontario Rotator Cuff Index (Short-WORC) in Patients With Rotator Cuff Repair**

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**48 **Issue:**5 **Pages:**409–418 **DOI:**10.2519/jospt.2018.7928

**Study Design**

Clinical measurement.

**Background**

Recently, the Western Ontario Rotator Cuff Index (WORC) was shortened, but few studies have reported its measurement properties.

**Objective**

To compare the validity and responsiveness of the short version of the Western Ontario Rotator Cuff Index (Short-WORC) and the WORC (disease-specific measures) with those of the Shoulder Pain and Disability Index (SPADI) and the simple shoulder test (SST) (joint-specific measures); the Disabilities of the Arm, Shoulder and Hand (DASH) (a region-specific measure); and the Medical Outcomes Study 12-Item Short-Form Health Survey version 2 (SF-12v2) (a general health status measure) in patients undergoing rotator cuff repair (RCR).

**Methods**

A cohort of patients (n = 223) completed the WORC, SPADI, SST, DASH, and SF-12v2 preoperatively and at 3 and 6 months after RCR. Short-WORC scores were extracted from the WORC questionnaire. The construct validity (Pearson correlations) and internal responsiveness (effect size [ES], standardized response mean [SRM], relative efficiency [RE]) of the Short-WORC were calculated.

**Results**

The Short-WORC was strongly correlated with the WORC ( $r = 0.89-0.96$ ) and moderately to strongly correlated with non-disease-specific measures at preoperative and postoperative assessments ( $r = 0.51-0.92$ ). The Short-WORC and WORC were equally responsive ( $RE_{\text{Short-WORC/WORC}} = 1$ ) at 0 to 6 months and highly responsive overall at 0 to 3 months ( $ES_{\text{Short-WORC}}$ , 0.72;  $ES_{\text{WORC}}$ , 0.92;  $SRM_{\text{Short-WORC}}$ , 0.75;  $SRM_{\text{WORC}}$ , 0.81) and 0 to 6 months ( $ES_{\text{Short-WORC}}$ , 1.05;  $ES_{\text{WORC}}$ , 1.12;  $SRM_{\text{Short-WORC}}$ , 0.89;  $SRM_{\text{WORC}}$ , 0.89). The responsiveness of the comparator measures (SPADI, SST, DASH, SF-12v2) was poor to moderate at 0 to 3 months ( $ES$ , 0.07–0.55;  $SRM$ , 0.09–0.49) and 0 to 6 months ( $ES$ , 0.05–0.78;  $SRM$ , 0.07–0.78).

**Conclusion**

The Short-WORC and WORC have similar responsiveness in patients undergoing RCR, and are more responsive than non-disease-specific measures. Future studies should focus on validation of the Short-WORC in samples representing the spectrum of rotator cuff disorders. *J Orthop Sports Phys Ther* 2018;48(5):409–418. doi:10.2519/jospt.2018.7928

**28. REPLACEMENTS****Return to sports good**

Sports Medicine pp 1–32|

**The Effect of Total Hip Arthroplasty on Sports and Work Participation: A Systematic Review and Meta-Analysis**

Alexander Hoorntje Kim Y. Janssen Stefan B. T. Bolder Koen L. M. Koenraadt Joost G. Daams Leendert Blankevoort Gino M. M. J. Kerkhoffs P. Paul F. M. Kuijjer

**Background**

Total hip arthroplasty (THA) is a successful procedure to treat end-stage hip osteoarthritis. The procedure is increasingly performed in adults of working age, who often wish to return to sports (RTS) and return to work (RTW). However, a systematic overview of the evidence on RTS and RTW after THA is lacking.

**Objectives**

Our aim was to systematically review (1) the extent to which patients RTS and RTW after THA, including (2) the time to RTS and RTW.

**Methods**

We searched MEDLINE and Embase from inception until October 2017. Two authors screened and extracted the data, including study information, patient demographics, rehabilitation protocols and pre- and postoperative sports and work participation. Methodological quality was assessed using the Newcastle–Ottawa scale. Data on pre- and postoperative sports and work participation were pooled using descriptive statistics.

**Results**

A total of 37 studies were included, of which seven were prospective studies and 30 were retrospective studies. Methodological quality was high in 11 studies, moderate in 16 studies, and low in ten studies. RTS was reported in 14 studies. Mean RTS was 104% to the pre-surgery level and 82% to the pre-symptomatic sports level. Time to RTS varied from 16 to 28 weeks. RTW was reported in 23 studies; the mean was 69%. Time to RTW varied from 1 to 17 weeks.

**Conclusion**

A great majority of patients RTS and RTW after THA within a timeframe of 28 and 17 weeks, respectively. For the increasingly younger THA population, this is valuable information that can be used in the preoperative shared decision-making process

## 32 A. KNEE/ACL

## QOL after

**Quality of Life in Symptomatic Individuals After Anterior Cruciate Ligament Reconstruction, With and Without Radiographic Knee Osteoarthritis**

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**48 **Issue:**5 **Pages:**398–408 **DOI:**10.2519/jospt.2018.7830

**Study Design** Clinical measurement, cross-sectional.

**Background** Individuals who have undergone anterior cruciate ligament (ACL) reconstruction commonly experience long-term impairments in quality of life (QoL), which may be related to persistent knee symptoms or radiographic osteoarthritis (ROA). Understanding the impact of knee symptoms and ROA on QoL after ACL reconstruction may assist in the development of appropriate management strategies.

**Objectives** To (1) compare QoL between groups of individuals after ACL reconstruction (including those who are symptomatic with ROA, symptomatic without ROA, and asymptomatic [unknown ROA status]), and (2) identify specific aspects of QoL impairment in symptomatic individuals with and without ROA post ACL reconstruction.

**Methods** One hundred thirteen participants completed QoL measures (Knee injury and Osteoarthritis Outcome Score QoL subscale [KOOS-QoL], Anterior Cruciate Ligament Quality of Life [ACL-QoL], Assessment of Quality of Life-8 Dimensions [AQoL-8D]) 5 to 20 years after ACL reconstruction. Eighty-one symptomatic individuals underwent radiographs, and 32 asymptomatic individuals formed a comparison group. Radiographic osteoarthritis was defined as a Kellgren-Lawrence grade of 2 or greater for the tibiofemoral and/or patellofemoral joints. Mann-Whitney *U* tests compared outcomes between groups. Individual ACL-QoL items were used to explore specific aspects of QoL.

**Results**

In symptomatic individuals after ACL reconstruction, ROA was related to worse knee-related outcomes on the KOOS-QoL (median, 50; interquartile range [IQR], 38–69 versus median, 69; IQR, 56–81;  $P < .001$ ) and the ACL-QoL (median, 51; IQR, 38–71 versus median, 66; IQR, 50–82;  $P = .04$ ). The AQoL-8D scores showed that health-related QoL was impaired in both symptomatic groups compared to the asymptomatic group. The ACL-QoL item scores revealed greater limitations and concern surrounding sport and exercise and social/emotional difficulties in the symptomatic group with ROA.

**Conclusion**

Osteoarthritis is associated with worse knee-related QoL in symptomatic individuals after ACL reconstruction. Diagnosing ROA in symptomatic individuals after ACL reconstruction may be valuable, because these individuals may require unique management. Targeted strategies to facilitate participation in satisfying activities have potential to improve QoL in symptomatic people with ROA after ACL reconstruction. *J Orthop Sports Phys Ther* 2018;48(5):398–408. doi:10.2519/jospt.2018.7830

Keyword: pain, physical activity, psychological, radiology/medical imaging, sport

## Cognitive demands in ACL testing

### RESEARCH REPORT

#### Cognitive Demands Influence Lower Extremity Mechanics During a Drop Vertical Jump Task in Female Athletes

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, 2018 **Volume:**48 **Issue:**5 **Pages:**381–387 **DOI:**10.2519/jospt.2018.7739

#### Study Design

Cross-sectional study.

#### Background

The drop vertical jump task is commonly used to screen for anterior cruciate ligament injury risk; however, its predictive validity is limited. The limited predictive validity of the drop vertical jump task may be due to not imposing the cognitive demands that reflect sports participation.

#### Objectives

To investigate the influence of additional cognitive demands on lower extremity mechanics during execution of the drop vertical jump task.

#### Methods

Twenty uninjured women (age range, 18–25 years) were required to perform the standard drop vertical jump task, as well as drop vertical jumps that included additional cognitive demands. The additional cognitive demands were related to attending to an overhead goal (ball suspended overhead) and/or temporal constraints on movement selection (decision making). Three-dimensional ground reaction forces and lower extremity mechanics were compared between conditions.

#### Results

The inclusion of the overhead goal resulted in higher peak vertical ground reaction forces and lower peak knee flexion angles in comparison to the standard drop vertical jump task. In addition, participants demonstrated greater peak knee abduction angles when trials incorporated temporal constraints on decision making and/or required participants to attend to an overhead goal, in comparison to the standard drop vertical jump task.

#### Conclusion

Imposing additional cognitive demands during execution of the drop vertical jump task influenced lower extremity mechanics in a manner that suggested increased loading of the anterior cruciate ligament. Tasks utilized in anterior cruciate ligament injury risk screening may benefit from more closely reflecting the cognitive demands of the sports environment. *J Orthop Sports Phys Ther* 2018;48(5):381–387. Epub 10 Jan 2018. doi:10.2519/jospt.2018.7739


Keyword: anterior cruciate ligament injury, biomechanics,

### 33. MENISCUS

#### Mulligan squeeze

#### Original Research Paper

#### Innovative treatment of clinically diagnosed meniscal tears: a randomized sham-controlled trial of the Mulligan concept 'squeeze' technique

Robinetta Hudson, Amy Richmond, Belinda Sanchez, Valerie Stevenson , Russell T. Baker, James May,

<https://doi.org/10.1080/10669817.2018.1456614>

#### Abstract

**Objective:** The purpose of this study was to assess the effects of the Mulligan Concept (MC) 'squeeze' technique compared to a sham technique in participants with a clinically diagnosed meniscal tear.

**Methods:** A multi-site randomized sham-controlled trial of participants ( $n = 23$ ), aged  $24.91 \pm 12.09$  years, with a clinically diagnosed meniscal tear were equally and randomly divided into two groups. Groups received a maximum of six treatments over 14 days. Patient outcomes included the numeric pain rating scale (NRS), patient-specific functional scale (PSFS), the disablement in the physically active (DPA) scale and the knee injury osteoarthritis outcome score. Data were analysed using univariate ANOVA, univariate ANCOVA, and descriptive statistics.

**Results:** All participants in the MC 'squeeze' group met the discharge criteria of  $\leq 2$  points on the NRS,  $\geq 9$  points on the PSFS, and  $\leq 34$  points or  $\leq 23$  on the DPA Scale for chronic or acute injuries, respectively within the treatment intervention timeframe. A significant difference was found in favor of the MC 'squeeze' technique in PSFS scores ( $F(1, 21) = 4.40, p = .048$ , partial eta squared = .17, observed power = .52) and in DPA Scale scores ( $F(1, 21) = 7.46, p = .013$ , partial eta squared = .27, observed power = .74).

**Discussion:** The results indicate the MC 'squeeze' technique had positive effects on patient function and health-related quality of life over a period of 14 days and was clinically and statistically superior to the sham treatment. Further investigation of the MC 'squeeze' technique is warranted.



**37. OSTEOARTHRITIS/KNEE****Central changes in response to pain**

Pain. 2018 May;159(5):929-938. doi: 10.1097/j.pain.0000000000001209.

**Altered connectivity of the right anterior insula drives the pain connectome changes in chronic knee osteoarthritis.**

Cottam WJ<sup>1,2,3</sup>, Iwabuchi SJ<sup>1,2,3</sup>, Drabek MM<sup>1,2,3</sup>, Reckziegel D<sup>1,2,3</sup>, Auer DP<sup>1,2,3</sup>.

Resting-state functional connectivity (FC) has proven a powerful approach to understand the neural underpinnings of chronic pain, reporting altered connectivity in 3 main networks: the default mode network (DMN), central executive network, and the salience network (SN). The interrelation and possible mechanisms of these changes are less well understood in chronic pain. Based on emerging evidence of its role to drive switches between network states, the right anterior insula (rAI, an SN hub) may play a dominant role in network connectivity changes underpinning chronic pain.

To test this hypothesis, we used seed-based resting-state FC analysis including dynamic and effective connectivity metrics in 25 people with chronic osteoarthritis (OA) pain and 19 matched healthy volunteers.

Compared with controls, participants with painful knee OA presented with increased anticorrelation between the rAI (SN) and DMN regions. Also, the left dorsal prefrontal cortex (central executive network hub) showed more negative FC with the right temporal gyrus. Granger causality analysis revealed increased negative influence of the rAI on the posterior cingulate (DMN) in patients with OA in line with the observed enhanced anticorrelation. Moreover, dynamic FC was lower in the DMN of patients and thus more similar to temporal dynamics of the SN.

Together, these findings evidence a widespread network disruption in patients with persistent OA pain and point toward a driving role of the rAI.

PMID: 29557928 DOI: 10.1097/j.pain.0000000000001209

**Activity level**

Semin Arthritis Rheum. 2018 Apr;47(5):683-688. doi: 10.1016/j.semarthrit.2017.10.005. Epub 2017 Oct 9.

**Relationship of knee pain to time in moderate and light physical activities: Data from Osteoarthritis Initiative.**

Song J<sup>1</sup>, Chang AH<sup>2</sup>, Chang RW<sup>3</sup>, Lee J<sup>4</sup>, Pinto D<sup>5</sup>, Hawker G<sup>6</sup>, Nevitt M<sup>7</sup>, Dunlop DD<sup>8</sup>.

**INTRODUCTION:**

While OA literature indicates greater pain is related to less time being physically active, it is not known if time curtailment occurs primarily for moderate intensity activities or for light activities or in both. We examine the cross-sectional association of knee pain with physical activity using data from 1874 Osteoarthritis Initiative participants.

**METHODS:**

Knee pain characteristics of constant and intermittent pain were each scored by the Intermittent and Constant Osteoarthritis Pain instrument and categorized into four pain levels (no pain, intermittent pain below and above median level, and constant pain). The relationships between knee pain levels and objectively measured physical activity (average weekly moderate or light intensity minutes) were assessed by quantile regression adjusted for socio-demographics and health factors.

**RESULTS:**

Knee pain levels had a strong negative relationship with moderate intensity physical activities (p-value for trend =0.029). Compared to the no pain group, persons with more severe knee pain, particularly those reporting higher intermittent or constant pain spent less time in moderate activity. In contrast, there was no notable trend related to pain with time spent in light intensity activity. These patterns remained when restricted to persons with clinical evidence (symptoms and/or radiographic) of knee OA and among persons not using medications for knee symptoms.

**CONCLUSION:**

Greater knee pain levels were strongly related to less moderate intensity activity time, but not time spent in light intensity physical activity. This relationship suggests that light activity may be a more acceptable way to increase physical activity than moderate activity for people with symptomatic knee pain.

## Exercise helps

Br J Sports Med. 2018 Mar 16. pii: bjsports-2017-098099. doi: 10.1136/bjsports-2017-098099.

**What interventions can improve quality of life or psychosocial factors of individuals with knee osteoarthritis? A systematic review with meta-analysis of primary outcomes from randomised controlled trials.**

Briani RV<sup>1</sup>, Ferreira AS<sup>1</sup>, Pazzinatto MF<sup>1</sup>, Pappas E<sup>2</sup>, De Oliveira Silva D<sup>3</sup>, Azevedo FM<sup>1</sup>.

*OBJECTIVE:*

To systematically review evidence of primary outcomes from randomised controlled trials (RCTs) examining the effect of treatment strategies on quality of life (QoL) or psychosocial factors in individuals with knee osteoarthritis (OA).

*DESIGN:*

Systematic review with meta-analysis.

*DATA SOURCES:*

Medline, Embase, SPORTDiscus, the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Web of Science were searched from inception to November 2017.

*ELIGIBILITY CRITERIA FOR SELECTING STUDIES:*

We included RCTs investigating the effect of conservative interventions on QoL or psychosocial factors in individuals with knee OA. Only RCTs considering these outcomes as primary were included.

*RESULTS:*

Pooled data supported the use of exercise therapy compared with controls for improving health-related and knee-related QoL. There was limited evidence that a combined treatment of yoga, transcutaneous electrical stimulation and ultrasound may be effective in improving QoL. Limited evidence supported the use of cognitive behavioural therapies (with or without being combined with exercise therapy) for improving psychosocial factors such as self-efficacy, depression and psychological distress.

*SUMMARY/CONCLUSION:*

Exercise therapy (with or without being combined with other interventions) seems to be effective in improving health-related and knee-related QoL or psychosocial factors of individuals with knee OA. In addition, evidence supports the use of cognitive behavioural therapies (with or without exercise therapy) for improving psychosocial factors such as self-efficacy, depression and psychological distress in individuals with knee OA.

### 45 A. MANUAL THERAPY LUMBAR & GENERAL

#### Temperature detection

##### Original Research Paper

##### **Detection of skin temperature differences using palpation by manual physical therapists and lay individuals**

**David Levine**, J. Randy Walker, Denis J. Marcellin-Little , Ron Goulet & Hongyu Ru

<https://doi.org/10.1080/10669817.2018.1427908>

**Objectives**—To evaluate the accuracy of detection of temperature differences among skin sites of lay individuals and manual physical therapists.

**Methods**—Forty-four manual physical therapists and 44 lay individuals were recruited. Subjects palpated two temperature-controlled surfaces that ranged in temperature between 30 and 35 °C and varied randomly by 1, 2, 3, 4, or 5 °C for 10 s. The subjects were then asked to identify the warmer pad.

**Results**—Accuracy increased with larger temperature differences. Accuracy of detection of 1 and 3 °C temperature differences was higher in manual physical therapists than lay individuals.

**Discussion**—Palpation can be used to accurately detecting temperature differences between sites and is more accurately performed by an experienced practitioner.

**Level of Evidence:** 3b

**Prescribed vs. prescriptive care****The impact of pragmatic vs. prescriptive study designs on the outcomes of low back and neck pain when using mobilization or manipulation techniques: a systematic review and meta-analysis**

**Daniel Roenz**, Jake Broccolo, Steven Brust, Jordan Billings, Alexander Perrott, Jeremy Hagadorn

<https://doi.org/10.1080/10669817.2017.1398923>

**Abstract**

**Objective:** The purpose of this systematic review and meta-analysis was to examine the impact of pragmatic versus prescriptive study designs on the outcomes of low back and neck pain when using mobilization or manipulation techniques.

**Methods:** This study design was a systematic review and meta-analysis, which was performed according to the PRISMA guidelines. A search of MEDLINE and CINAHL complete databases was performed. Article titles and abstracts were reviewed to identify studies comparing mobilization and manipulation in low back or neck pain that met eligibility criteria. Validity of studies was examined using the Cochrane Risk of Bias tool. Data analysis was performed using RevMan 5.3. Forest plots were constructed after data were analyzed to determine effect sizes.

**Results:** Thirteen studies with a total of 1313 participants were included in the systematic review, and 12 studies with 977 participants in the meta-analysis. For most time-points prescriptive studies found manipulation to be superior to mobilization for both pain and disability. At no time-point did pragmatic designs find a difference between mobilization and manipulation for either pain or disability.

**Discussion:** When a pragmatic design was used, representing actual clinical practice, patients improved with both techniques with no difference between mobilization and manipulation. When clinicians were prescribed techniques, not representing true clinical practice, manipulation showed better outcomes than mobilization for pain and disability.

**Directional preference and CBT in LBP**

Physiother Res Int. 2018 Mar 14. doi: 10.1002/pri.1711.

**Directional preference and functional outcomes among subjects classified at high psychosocial risk using STarT.**

Werneke MW<sup>1</sup>, Edmond S<sup>2</sup>, Young M<sup>3</sup>, Grigsby D<sup>4</sup>, McClenahan B<sup>5</sup>, McGill T<sup>6</sup>.

*BACKGROUND AND PURPOSE:*

Physiotherapy has an important role in managing patients with non-specific low back pain who experience elevated psychosocial distress or risk for chronic disability. In terms of evidence-based physiotherapy practice, cognitive-behavioural approaches for patients at high psychosocial risk are the recommended management to improve patient treatment outcomes. Evidence also suggests that directional preference (DP) is an important treatment effect modifier for prescribing specific exercises for patients to improve outcomes. Little is known about the influence of treatment techniques based on DP on outcomes for patients classified as high psychosocial risk using the Subgroups for Targeted Treatment (STarT) Back Screening Tool. This study aimed to examine the association between functional status (FS) at rehabilitation discharge for patients experiencing low back pain classified at high STarT psychosocial risk and whose symptoms showed a DP versus No-DP.

*METHODS:*

High STarT risk patients (n = 138) completed intake surveys, that is, the lumbar FS of Focus On Therapeutic Outcomes, Inc., and STarT, and were evaluated for DP by physiotherapists credentialed in McKenzie methods. The FS measure of Focus On Therapeutic Outcomes, Inc., was repeated at discharge. DP and No-DP prevalence rates were calculated. Associations between first-visit DP and No-DP and change in FS were assessed using univariate and multivariate regression models controlling for 11 risk-adjusted variables.

*RESULTS:*

One hundred nine patients classified as high STarT risk had complete intake and discharge FS and DP data. Prevalence rate for DP was 65.1%. A significant and clinically important difference (7.98 FS points; p = .03) in change in function at discharge between DP and No-DP was observed after controlling for all confounding variables in the final model.

*CONCLUSION:*

Findings suggest that interventions matched to DP are effective for managing high psychological risk patients and may provide physiotherapists with an alternative treatment pathway compared to managing similar patients with cognitive-behavioural approaches. Stricter research designs are required to validate study conclusions.

## 45 D. MANUAL THERAPY EXTREMITIES

## PFP MT

## RESEARCH REPORT

**Effectiveness of Manual Therapy for Pain and Self-reported Function in Individuals With Patellofemoral Pain: Systematic Review and Meta-analysis**

**Authors:** Brian J. Eckenrode, PT, DPT, OCS<sup>1,2</sup>, David M. Kietrys, PT, PhD, OCS<sup>2</sup>, J. Scott Parrott, PhD<sup>2</sup>

**Published:** *Journal of Orthopaedic & Sports Physical Therapy*,  
2018 **Volume:**48 **Issue:**5 **Pages:**358–371 **DOI:**10.2519/jospt.2018.7243

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**Study Design** Systematic literature review with meta-analysis.

**Background** Management of patellofemoral pain (PFP) may include the utilization of manual therapy (MT) techniques to the patellofemoral joint, surrounding soft tissues, and/or lumbopelvic region.

**Objectives** To determine the effectiveness of MT, used alone or as an adjunct intervention, compared to standard treatment or sham for reducing pain and improving self-reported function in individuals with PFP.

**Methods**

An electronic literature search was conducted in the PubMed, Ovid, Cochrane Central Register of Controlled Trials, and CINAHL databases for studies investigating MT for individuals with PFP. Studies published through August 2017 that compared MT (local or remote to the knee), used alone or in combination with other interventions, to control or sham interventions were included. Patient-reported pain and functional outcomes were collected and synthesized. Trials were assessed via the Cochrane risk-of-bias tool, and a meta-analysis of the evidence was performed.

**Results**

Nine studies were included in the review, 5 of which were rated as having a low risk of bias. The use of MT, applied to the local knee structure, was associated with favorable short-term changes in self-reported function and pain in individuals with PFP, when compared to a comparison (control or sham) intervention. However, the changes were clinically meaningful only for pain (defined as a 2-cm or 2-point improvement on a visual analog scale or numeric pain-rating scale). The evidence regarding lumbopelvic manipulation was inconclusive for pain improvement in individuals with PFP, based on 3 studies.

**Conclusion**

The data from this review cautiously suggest that MT may be helpful in the short term for decreasing pain in patients with PFP. Several studies integrated MT into a comprehensive treatment program. Changes in self-reported function with the inclusion of MT were shown to be significant, but not clinically meaningful. The limitations in the studies performed to date suggest that future research should determine the optimal techniques and dosage of MT and perform longer follow-up to monitor long-term effects.

**Level of Evidence** Therapy, level 1a. *J Orthop Sports Phys Ther* 2018;48(5):358–371. Epub 6 Jan 2018. doi:10.2519/jospt.2018.7243

**46 A. UPPER LIMB NEUROMOBILIZATION****Taping and perception**

J Sci Med Sport. 2018 Apr;21(4):342-346. doi: 10.1016/j.jsams.2017.07.008. Epub 2017 Jul 14.

**The effect of rigid taping with tension on mechanical displacement of the skin and change in pain perception.**

Chen SM<sup>1</sup>, Lo SK<sup>2</sup>, Cook J<sup>3</sup>.

*OBJECTIVES:*

To investigate the effect of rigid taping that induces mechanical displacement of the skin on pain perception.

*DESIGN:*

Single group experiment design with repeated measures.

*METHODS:*

Twenty-three active healthy volunteers (12 men and 11 women) participated in the study. All participants received three different taping procedures: no tape, taping with tension, and taping without tension. The order of three taping conditions was randomised. Skin displacement was measured during taping with tension. A pressure algometer was used to measure the level of pain perception once before taping, and again after each taping condition, in one testing session. The participants were blind to the values of their pressure pain threshold (PPT) during the experimental period.

*RESULTS:*

The mean±SD skin displacement in the condition of taping with tension was 2.58±0.49cm. There were significant differences in PPT between taping with tension and taping without tension (mean difference (mean diff)±standard error (SE) 36.43±4.22kPa, p=0.000) and no tape (mean diff±SE 44.31±3.13kPa, p=0.000). No significant difference in PPT between no tape and taping without tension was found (mean diff±SE 7.88±2.83kPa, p=0.067).

*CONCLUSIONS:*

Taping with tension increases the threshold of pressure pain perception. Therefore, stretch and compression caused by rigid taping with tension could disturb the nociceptive signal transmission and alter pain perception.



## Vs. pharmacology

Int J Med Sci. 2018; 15(5): 456–465. Published online 2018 Mar 8. doi: 10.7150/ijms.23525  
PMCID: PMC5859768 PMID: 29559834

**Is pharmacologic treatment better than neural mobilization for cervicobrachial pain? A randomized clinical trial**

César Calvo-Lobo,<sup>1</sup> Francisco Unda-Solano,<sup>2</sup> Daniel López-López,<sup>3,✉</sup> Irene Sanz-Corbalán,<sup>4</sup> Carlos Romero-Morales,<sup>5</sup> Patricia Palomo-López,<sup>6</sup> Jesús Seco-Calvo,<sup>7</sup> and David Rodríguez-Sanz<sup>5</sup>

**Purpose:** This study aim was to compare the effectiveness of the median nerve neural mobilization (MNNM) and cervical lateral glide (CLG) intervention versus oral ibuprofen (OI) in subjects who suffer cervicobrachial pain (CP).

**Methods:** This investigation was a, multicenter, blinded, randomized controlled clinical trial (NCT02595294; NCT02593721). A number of 105 individuals diagnosed with CP were enrolled in the study and treated in 2 different medical facilities from July to November 2015. Participants were recruited and randomly assigned into 3 groups of 35 subjects. Intervention groups received MNNM or CLG neurodynamic treatments, and the (active treatment) control group received an OI treatment for 6 weeks. Primary outcome was pain intensity reported through the Numeric Rating Scale for Pain (NRSP). Secondary outcomes were physical function involving the affected upper limb using the Quick DASH scale, and ipsilateral cervical rotation (ICR) using a cervical range of motion (CROM) device. Assessments were performed before and 1 hour after treatment for NRSP (baseline, 3 and 6 weeks) and CROM (baseline and 6 weeks), as well as only 1 assessment for Quick DASH (baseline and 6 weeks).

**Results:** Repeated-measures ANOVA intergroup statistically significant differences were shown for CP intensity ( $F_{(2,72)} = 22.343$ ;  $P < .001$ ;  $\text{Eta}^2 = 0.383$ ) and Quick DASH ( $F_{(2,72)} = 15.338$ ;  $P < .001$ ;  $\text{Eta}^2 = 0.299$ ), although not for CROM ( $F_{(2,72)} = 1.434$ ;  $P = .245$ ;  $\text{Eta}^2 = 0.038$ ). Indeed, Bonferroni's correction showed statistically significant differences for CP intensity ( $P < .01$ ; 95% CI = 0.22 - 3.26) and Quick DASH reduction ( $P < .01$ ; 95% CI = 8.48 - 24.67) in favor of the OI treatment at all measurement moments after baseline.

**Conclusions:** OI pharmacologic treatment may reduce pain intensity and disability with respect to neural mobilization (MNNM and CLG) in patients with CP during six weeks. Nevertheless, the non-existence of between-groups ROM differences and possible OI adverse effects should be considered.

**48 A. STM****Fascial rx safe**

Musculoskelet Sci Pract. 2018 Mar 12;35:90-94. doi: 10.1016/j.msksp.2018.03.003

**Safety of fascial therapy in adult patients with hemophilic arthropathy of ankle. A cohort study.**

Donoso-Úbeda E<sup>1</sup>, Meroño-Gallut J<sup>2</sup>, López-Pina JA<sup>3</sup>, Cuesta-Barriuso R<sup>4</sup>.

**BACKGROUND:**

Hemophilic arthropathy is characterized by loss of function and chronic pain. Fascial therapy mobilizes the connective tissue, intervening in the state of the injured fascial complex and the surrounding tissues.

**OBJECTIVES:**

The aim of this study is to evaluate the safety of a physiotherapy program through fascial therapy in adult patients with hemophilic ankle arthropathy.

**DESIGN:**

Prospective cohort study.

**METHODS:**

Twenty-three adult patients with hemophilia from 26 to 65 years of age were recruited. The intervention consisted of three sessions of 45-minute fascial therapy for three consecutive weeks. An evaluation was carried out before as well as after treatment. The study variables were joint status (assessed with Hemophilia Joint Health Score), joint pain (using visual analogue scale), ankle range of motion (with a universal goniometer) and bleeding frequency (administering self-registration of bleeding). The mean difference was calculated using the Student's t-test for paired samples and using the Cohen formula we calculated the effect size of the dependent variables.

**RESULTS:**

None of the patients developed muscular or articular bleeding during the treatment period. After treatment, significant improvements ( $p < 0.05$ ) in plantar flexion, ankle pain under load and joint condition were observed in both ankles. Similarly, we found improvement in left ankle dorsiflexion.

**CONCLUSIONS:**

The application of physiotherapy through fascial therapy does not appear to produce muscle or joint hemorrhages. A treatment through three sessions of fascial therapy may improve joint pain, mobility and joint ankle condition in patients with hemophilic arthropathy.

**51. CFS/BET****Breaks during work helps LBP**

Appl Ergon. 2018 Apr;68:230-239. doi: 10.1016/j.apergo.2017.12.003. Epub 2017 Dec 8.

**The effects of breaks on low back pain, discomfort, and work productivity in office workers: A systematic review of randomized and non-randomized controlled trials.**

Waongenngarm P<sup>1</sup>, Areerak K<sup>2</sup>, Janwantanakul P<sup>3</sup>.

The purpose of this study was to evaluate the effectiveness of breaks on low back pain, discomfort, and work productivity in office workers.

Publications were systematically searched in several databases from 1980 to December 2016. Relevant randomized and non-randomized controlled trials were retrieved and assessed for methodological quality by two independent reviewers. Quality of evidence was assessed and rated according to GRADE guidelines. Eight randomized controlled trials and three non-randomized controlled trials were included in this review, of which 10 were rated as high-quality studies. The break programs were highly heterogeneous with work duration ranging from 5 min to 2 h and break duration ranging from 20 s to 30 min. The results showed low-quality evidence for the conflicting effect of breaks on pain and low-quality evidence for the positive effect of breaks on discomfort. When stratified by type of breaks, moderate-quality evidence was found for the positive effect of active breaks with postural change for pain and discomfort. Moderate-quality evidence indicated that the use of breaks had no detrimental effect on work productivity.

More high-quality studies are needed before recommendations can be given. Within a number of methodological limitations that are present in the published studies, active breaks with postural change may be effective in reducing pain in workers with acute low back pain and to prevent discomfort in healthy subjects.

## 52. EXERCISE

### Helps osteoporosis

Osteoporos Int. 2018 Feb;29(2):265-286. doi: 10.1007/s00198-017-4339-y. Epub 2018 Jan 6.

#### **Exercise to improve functional outcomes in persons with osteoporosis: a systematic review and meta-analysis.**

Varahra A<sup>1</sup>, Rodrigues IB<sup>2</sup>, MacDermid JC<sup>3</sup>, Bryant D<sup>3</sup>, Birmingham T<sup>3</sup>.

Osteoporosis affects many aspects of daily life. The aim of this systematic review was to assess the effects of exercise interventions on functional outcomes in persons with osteoporosis, in comparison with controls.

#### *METHODS:*

Four databases were searched and yielded 1587 citations. Two reviewers independently determined study eligibility, rated risk of bias, appraised methodological quality of studies, and resolved discordance by consensus.

#### *RESULTS:*

A total of 28 studies examining 2113 participants met inclusion criteria; 25 studies were suitable for meta-analyses. Four categories of exercise were identified using the ProFaNE taxonomy. After removing studies with high risk of bias and sorting them into intervention sub-types, we were able to sufficiently reduce the heterogeneity. The standardized mean difference (SMD) favored multicomponent exercise for mobility (- 0.56, 95% CI [- 0.81, - 0.32],  $p = 0.06$ ,  $I^2 = 51\%$ ); balance (0.50, 95% CI [0.27, 0.74],  $p = 0.28$ ,  $I^2 = 21\%$ ); and self-reported measures of functioning (- 0.69, 95% CI [- 1.04, - 0.34],  $p = 0.02$ ,  $I^2 = 61\%$ ). Trials were judged at low or unclear risk of selection bias, indicating inadequate reporting and at high risk of performance bias due to lack of participant blinding. The mean methodological quality rating of the studies was 63.5% indicating moderate quality.

#### *CONCLUSIONS:*

A multicomponent exercise program of high-speed training combined with simulated functional tasks is promising to enhance functional outcomes. Due to substantial clinical heterogeneity of the target groups and specific demands of exercise modes, it is unclear which exercise program is optimal.

**Sitting exercises**

Exp Gerontol. 2018 Apr 12;108:125-130. doi: 10.1016/j.exger.2018.04.009.

**Effects of 3-months sitting callisthenic balance and resistance exercise on aerobic capacity, aortic stiffness and body composition in healthy older participants. Randomized Controlled Trial.**

Kujawski S<sup>1</sup>, Kujawska A<sup>2</sup>, Gajos M<sup>3</sup>, Klawe JJ<sup>4</sup>, Tafil-Klawe M<sup>5</sup>, Mądra-Gackowska K<sup>3</sup>, Stankiewicz B<sup>6</sup>, Newton JL<sup>7</sup>, Kędziora-Kornatowska K<sup>3</sup>, Zalewski P<sup>4</sup>.

**BACKGROUND:**

Arterial stiffness (AS) is a reduction in the ability of large arteries to readily accommodate the increase in blood ejected from the heart during systole related with aging. Physical exercise is associated with AS reduction. However, it remains controversial as to which modality and intensity (resistance vs aerobic, high vs low) would be the most effective. The aim of these studies is to examine the effects of 3-months sitting callisthenic balance (SCB) and resistance exercise (RET) on aerobic capacity, aortic stiffness and body composition in older participants.

**MATERIAL AND METHODS:**

Aortic pulse wave velocity (PWVao), return time (RT), diastolic reflection area (DRA) and blood pressure (BP) level changes were measured with Arteriograph. Aerobic capacity was examined with 6-min walk test (6-MWT) and spiroergometry (VO<sub>2</sub>max). Body composition was analyzed by Bioelectric Impedance Analysis using Tanita.

**RESULTS:**

Significant improvements of BP, PWVao, RT and DRA were observed in the SCB group ( $p = 0.018$ ,  $p = 0.017$  and  $p = 0.012$ , respectively). % of fat mass improved in RET and SCB group ( $p = 0.003$ ,  $p = 0.012$ , respectively). Visceral fat significantly improved in SCB group ( $p = 0.03$ ).

**CONCLUSIONS:**

Despite no significant changes in indicators of aerobic capacity (VO<sub>2</sub>max and 6MWT result) in both groups, significant improvement in all measures of AS, except SBPao were observed in the SCB group, while no AS improvement in the RET group was noted. There were some differences in pattern of body compositions improvement between two groups.

**Improvement in hippocampal function**

Neuroimage. 2018 Feb 1;166:230-238. doi: 10.1016/j.neuroimage.2017.11.007. Epub 2017 Nov 4.

**Effect of aerobic exercise on hippocampal volume in humans: A systematic review and meta-analysis.**

Firth J<sup>1</sup>, Stubbs B<sup>2</sup>, Vancampfort D<sup>3</sup>, Schuch F<sup>4</sup>, Lagopoulos J<sup>5</sup>, Rosenbaum S<sup>6</sup>, Ward PB<sup>7</sup>.

**Author information****Abstract**

Hippocampal volume increase in response to aerobic exercise has been consistently observed in animal models. However, the evidence from human studies is equivocal.

We undertook a systematic review to identify all controlled trials examining the effect of aerobic exercise on the hippocampal volumes in humans, and applied meta-analytic techniques to determine if aerobic exercise resulted in volumetric increases. We also sought to establish how volume changes differed in relation to unilateral measures of left/right hippocampal volume, and across the lifespan.

A systematic search identified 4398 articles, of which 14 were eligible for inclusion in the primary analysis. A random-effects meta-analysis showed no significant effect of aerobic exercise on total hippocampal volume across the 737 participants. However, aerobic exercise had significant positive effects on left hippocampal volume in comparison to control conditions. Post-hoc analyses indicated effects were driven through exercise preventing the volumetric decreases which occur over time.

These results provide meta-analytic evidence for exercise-induced volumetric retention in the left hippocampus. Aerobic exercise interventions may be useful for preventing age-related hippocampal deterioration and maintaining neuronal health.

**Hip extension**

Physiother Theory Pract. 2018 Mar 30:1-7. doi: 10.1080/09593985.2018.1453569.

**Comparison of hip extensor muscle activity including the adductor magnus during three prone hip extension exercises.**

Ko HI PT<sup>1</sup>, Jeon SY PT<sup>1</sup>, Kim SH PT, PhD<sup>2</sup>, Park KN PT, PhD<sup>1</sup>.

**OBJECTIVES:**

This study compared the role of the adductor magnus muscle (Amag) as a hip extensor while performing active prone hip extension (PHE), PHE with hip adduction (PHE-ADD), and PHE with hip abduction (PHE-ABD) with the gluteus maximus (Gmax) and hamstrings.

**METHODS:**

The study recruited 22 healthy participants. Electromyography data were recorded from the Amag, Gmax, and medial and lateral hamstrings during PHE, PHE-ADD, and PHE-ABD. Normalized electromyographic data were examined using one-way, repeated-measures analyses of variance.

**RESULTS:**

The magnitude of the Amag, Gmax, and hamstring activations did not differ significantly while performing PHE ( $p = 0.41$ ). Furthermore, the Amag and hamstring activations were significantly greater than the Gmax activation when performing PHE-ADD ( $p < 0.05$ ). The Gmax showed significantly greater activation during PHE-ABD than the Amag and medial and lateral hamstrings ( $p < 0.05$ ).

**CONCLUSIONS:**

Based on these results, we advocate including the Amag as a hip extensor during the PHE test or exercise. Our preliminary results have the potential to be applied directly to the PHE test, for investigating the muscle-activation pattern of the Amag with the Gmax and hamstrings in patients with hip or lower back pain.

**Band resistance in LBP**

Scand J Med Sci Sports. 2018 Mar 31. doi: 10.1111/sms.13091.

**Resistance band training or general exercise in multidisciplinary rehabilitation of low back pain? A randomized trial.**

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Abstract

Multidisciplinary biopsychosocial rehabilitation has been recommended for chronic low back pain (LBP), including physical exercise.

However, which exercise modality that is most advantageous in multidisciplinary biopsychosocial rehabilitation is unclear.

In this study, we investigated whether multidisciplinary biopsychosocial rehabilitation could be more effective in reducing pain-related disability when general physical exercise was replaced by strength training in the form of progressive resistance training using elastic resistance bands. In this single-blinded (researchers), randomized controlled trial, 99 consenting adults with moderate-to-severe non-specific LBP were randomized to three weeks of multidisciplinary biopsychosocial rehabilitation with either general physical exercise or progressive resistance band training and were then instructed to continue with their respective home-based programs for nine additional weeks, in which three booster sessions were offered. The primary outcome was between-group difference in change on the Oswestry Disability Index (ODI) at 12 weeks. Due to early dropouts, data from 74 participants (mean age: 45 years, 57% women, mean ODI: 30.4) were obtained at baseline, 61 participants were followed-up at 3 weeks, and 46 at 12 weeks.

There was no difference in the change in ODI score between groups at 12 weeks (mean difference 1.9, 95% CI: -3.6, 7.4,  $P = .49$ ). Likewise, the change in secondary outcomes did not differ between groups, except for the patient-specific functional scale (0-10), which favored general physical exercise (mean difference 1.4, 95% CI: 0.1, 2.7,  $P = .033$ ). In conclusion, this study does not support that progressive resistance band training compared to general physical exercise improve outcomes in multidisciplinary biopsychosocial rehabilitation for patients with non-specific LBP.



**Pilates helps LBP**

Br J Sports Med. 2018 Mar 10. pii: bjsports-2017-098825. doi: 10.1136/bjsports-2017-098825.

**Different doses of Pilates-based exercise therapy for chronic low back pain: a randomised controlled trial with economic evaluation.**

Miyamoto GC<sup>1,2</sup>, Franco KFM<sup>1</sup>, van Dongen JM<sup>2</sup>, Franco YRDS<sup>1</sup>, de Oliveira NTB<sup>1</sup>, Amaral DDV<sup>1</sup>, Branco ANC<sup>1</sup>, da Silva ML<sup>1</sup>, van Tulder MW<sup>2</sup>, Cabral CMN<sup>1</sup>.

**OBJECTIVES:**

To evaluate the effectiveness and cost-utility of the addition of different doses of Pilates to an advice for non-specific chronic low back pain (NSCLBP) from a societal perspective.

**DESIGN:**

Randomised controlled trial with economic evaluation.

**SETTING:**

Physiotherapy clinic in São Paulo, Brazil.

**PARTICIPANTS:**

296 patients with NSCLBP.

**INTERVENTIONS:**

All patients received advice and were randomly allocated to four groups (n=74 per group): booklet group (BG), Pilates once a week (Pilates group 1, PG1), Pilates twice a week (Pilates group 2, PG2) and Pilates three times a week (Pilates group 3, PG3).

**MAIN OUTCOME MEASURES:**

Primary outcomes were pain and disability at 6-week follow-up.

**RESULTS:**

Compared with the BG, all Pilates groups showed significant improvements in pain (PG1, mean difference (MD)=-1.2, 95% CI -2.2 to -0.3; PG2, MD=-2.3, 95% CI -3.2 to -1.4; PG3, MD=-2.1, 95% CI -3.0 to -1.1) and disability (PG1, MD=-1.9, 95% CI -3.6 to -0.1; PG2, MD=-4.7, 95% CI -6.4 to -3.0; PG3, MD=-3.3, 95% CI -5.0 to -1.6). Among the different doses, PG2 showed significant improvements in comparison with PG1 for pain (MD=-1.1, 95% CI -2.0 to -0.1) and disability (MD=-2.8, 95% CI -4.5 to -1.1). The cost-utility analysis showed that PG3 had a 0.78 probability of being cost-effective at a willingness-to-pay of £20 000 per quality-adjusted life-year gained.

**CONCLUSIONS:**

Adding two sessions of Pilates exercises to advice provided better outcomes in pain and disability than advice alone for patients with NSCLBP; non-specific elements such as greater attention or expectation might be part of this effect. The cost-utility analysis showed that Pilates three times a week was the preferred option.

**54. POSTURE****Postural sensorimotor training**

PLoS One. 2018 Mar 9;13(3):e0193358. doi: 10.1371/journal.pone.0193358. eCollection 2018.

**Postural sensorimotor training versus sham exercise in physiotherapy of patients with chronic non-specific low back pain: An exploratory randomised controlled trial.**

McCaskey MA<sup>1,2</sup>, Wirth B<sup>3</sup>, Schuster-Amft C<sup>2,4</sup>, de Bruin ED<sup>1,5</sup>.

Sensorimotor training (SMT) is popularly applied as exercise in rehabilitation settings, particularly for musculoskeletal pain. With insufficient evidence on its effect on pain and function, this exploratory randomised controlled trial investigated the potential effects of SMT in rehabilitation of chronic non-specific low back pain.

Two arms received 9x30 minutes physiotherapy with added interventions: The experimental arm received 15 minutes of postural SMT while the comparator arm performed 15 minutes of added sub-effective low-intensity training. A treatment blinded tester assessed outcomes at baseline 2-4 days prior to intervention, pre- and post-intervention, and at 4-week follow-up. Main outcomes were pain and functional status assessed with a 0-100mm visual analogue scale and the Oswestry Disability Questionnaire. Additionally, postural control was analysed using a video-based tracking system and a pressure plate during perturbed stance. Robust, nonparametric multivariate hypothesis testing was performed. 22 patients (11 females, aged 32 to 75 years) with mild to moderate chronic pain and functional limitations were included for analysis (11 per arm).

At post-intervention, average values of primary outcomes improved slightly, but not to a clinically relevant or statistically significant extent. At 4-week follow-up, there was a significant improvement by 12 percentage points (pp) on the functional status questionnaire in the SMT-group (95% confidence interval (CI) = 5.3pp to 17.7pp,  $p < 0.001$ ) but not in the control group (4 pp improvement, CI = 11.8pp to 19.2pp). However, group-by-time interaction effects for functional status ( $Q = 3.3$ ,  $19 p = 0.07$ ) and pain ( $Q = 0.84$ ,  $p = 0.51$ ) were non-significant. Secondary kinematic outcomes did not change over time in either of the groups.

Despite significant improvement of functional status after SMT, overall findings of this exploratory study suggest that SMT provides no added benefit for pain reduction or functional improvement in patients with moderate chronic non-specific low back pain.

**TRIAL REGISTRATION:**

ClinicalTrials.gov [NCT02304120](https://clinicaltrials.gov/ct2/show/study/NCT02304120) and related study protocol, DOI: 10.1186/1471-2474-15-382.

PMID: 9522571 PMCID: PMC5844549 DOI: 10.1371/journal.pone.0193358

**56. ATHLETICS****Knee and soccer**

Br J Sports Med. 2018 May;52(10):678-683. doi: 10.1136/bjsports-2017-097503. Epub 2017 Nov 3.

**Prevalence of knee pain, radiographic osteoarthritis and arthroplasty in retired professional footballers compared with men in the general population: a cross-sectional study.**

Fernandes GS<sup>1,2,3</sup>, Parekh SM<sup>1,2</sup>, Moses J<sup>1,2,4</sup>, Fuller C<sup>2,5</sup>, Scammell B<sup>1,2,3,4</sup>, Batt ME<sup>1,2,4</sup>, Zhang W<sup>1,2,3</sup>, Doherty M<sup>1,2,3</sup>.

**OBJECTIVES:**

To determine the prevalence of knee pain, radiographic knee osteoarthritis (RKO), total knee replacement (TKR) and associated risk factors in male ex-professional footballers compared with men in the general population (comparison group).

**METHODS:**

1207 male ex-footballers and 4085 men in the general population in the UK were assessed by postal questionnaire. Current knee pain was defined as pain in or around the knees on most days of the previous month. Presence and severity of RKO were assessed on standardised radiographs using the Nottingham Line Drawing Atlas (NLDA) in a subsample of 470 ex-footballers and 491 men in the comparison group. The adjusted risk ratio (aRR) and adjusted risk difference (aRD) with 95% CI in ex-footballers compared with the general population were calculated using the marginal model in Stata.

**RESULTS:**

Ex-footballers were more likely than the comparison group to have current knee pain (aRR 1.91, 95% CI 1.77 to 2.06), RKO (aRR 2.21, 95% CI 1.92 to 2.54) and TKR (aRR 3.61, 95% CI 2.90 to 4.50). Ex-footballers were also more likely to present with chondrocalcinosis (aRR 3.41, 95% CI 2.44 to 4.77). Prevalence of knee pain and RKO were higher in ex-footballers at all ages. However, even after adjustment for significant knee injury and other risk factors, there was more than a doubling of risk of these outcomes in footballers.

**CONCLUSIONS:**

The prevalence of all knee osteoarthritis outcomes (knee pain, RKO and TKR) were two to three times higher in male ex-footballers compared with men in the general population group. Knee injury is the main attributable risk factor. Even after adjustment for recognised risk factors, knee osteoarthritis appear to be an occupational hazard of professional football.

**57. GAIT****Walking helps LBP**

Musculoskelet Sci Pract. 2018 Apr;34:38-46. doi: 10.1016/j.msksp.2017.12.003. Epub 2017 Dec 12.

**The effects of walking intervention in patients with chronic low back pain: A meta-analysis of randomized controlled trials.**

Sitthipornvorakul E<sup>1</sup>, Klinsophon T<sup>2</sup>, Sihawong R<sup>2</sup>, Janwantanakul P<sup>3</sup>.

*OBJECTIVE:*

The aim of this meta-analysis of randomized controlled trials was to gain insight into the effectiveness of walking intervention on pain, disability, and quality of life in patients with chronic low back pain (LBP) at post intervention and follow ups.

*METHOD:*

Six electronic databases (PubMed, Science Direct, Web of Science, Scopus, PEDro and The Cochrane library) were searched from 1980 to October 2017. The following keywords were used: Walk\* or Pedometer\* or Accelerometer\* or Treadmill\* paired with "Back pain", "Low back pain", "Chronic low back pain", "LBP", or "Backache". Randomized controlled trials in patients with chronic LBP were included if they compared the effects of walking intervention to non-pharmacological interventions. Pain, disability, and quality of life were the primary health outcomes.

*RESULTS:*

Nine studies were suitable for meta-analysis. Data was analyzed according to the duration of follow-up (short-term, < 3 months; intermediate-term, between 3 and 12 months; long-term, > 12 months). Low- to moderate-quality evidence suggests that walking intervention in patients with chronic LBP was as effective as other non-pharmacological interventions on pain and disability reduction in both short- and intermediate-term follow ups.

*CONCLUSIONS:*

Unless supplementary high-quality studies provide different evidence, walking, which is easy to perform and highly accessible, can be recommended in the management of chronic LBP to reduce pain and disability.

## Conscious toe out gait or knee OA

## Osteoarthritis and Cartilage

**Clinical and biomechanical changes following a four-month toe-out gait modification program for people with medial knee osteoarthritis: A randomized controlled trial**

- Michael A. Hunt<sup>a, \*</sup>, Jesse M. Charlton<sup>a</sup>, Natasha M. Krowchuk<sup>a</sup>, Calvin T. Tse<sup>a</sup>, Gillian L. Hatfield<sup>a, b</sup>

<https://doi.org/10.1016/j.joca.2018.04.010>

## Objective

To compare changes in knee pain, function, and loading following a four-month progressive walking program with or without toe-out gait modification program in people with medial tibiofemoral knee osteoarthritis.

## Design

Individuals with medial knee osteoarthritis were randomized to a four month program to increase walking activity with (toe-out) or without (progressive walking) concomitant toe-out gait modification. The walking program was similar between the two groups, except that the gait modification group were trained to walk with 15° more toe-out. Primary outcomes included: knee joint pain (WOMAC), foot progression angles and knee joint loading during gait (knee adduction moment (KAM)). Secondary outcomes included WOMAC function, timed stair climb, and knee flexion moments during gait.

## Results

Seventy-nine participants (40 in toe-out group, 39 in progressive walking group) were recruited. Intention-to-treat analysis showed no between-group differences in knee pain, function, or timed stair climb. However, the toe-out group exhibited significantly greater changes in foot progression angle (mean difference = -9.04° (indicating more toe-out), 95% CI: -11.22°, -6.86°; p<0.001), late stance KAM (mean difference = -0.26 %BW\*ht, 95% CI: -0.39 %BW\*ht, -0.12 %BW\*ht, p<0.001) and KAM impulse (-0.06 %BW\*ht\*s, 95% CI: -0.11 %BW\*ht\*s, -0.01 %BW\*ht\*s; p=0.031) compared to the progressive walking group at follow-up. The only between-group difference that remained at a one-month retention assessment was foot progression angle, with greater changes in the toe-out group (mean difference = -6.78°, 95% CI: -8.82°, -4.75°; p<0.001).

## Conclusions

Though both groups experienced improvements in self-reported pain and function, only the toe-out group experienced biomechanical improvements.

**60. COMPLEX REGIONAL PAIN****Neglect**

Pain. 2018 May;159(5):978-986. doi: 10.1097/j.pain.0000000000001173.

**Correlates and importance of neglect-like symptoms in complex regional pain syndrome.**

Wittayer M<sup>1,2</sup>, Dimova V<sup>1</sup>, Birklein F<sup>1</sup>, Schlereth T<sup>1,3</sup>.

Neglect-like symptoms (NLS) are frequently observed in complex regional pain syndrome (CRPS).

The clinical meaning of NLS, however, is largely unknown. Therefore, this study sets out to assess the importance of NLS for patient outcome and to explore their clinical correlates. We assessed NLS in a group of 53 patients with CRPS and compared the results to 28 healthy volunteers.

To define the origin of the NLS reports, we tested the subjective visual midline, performed a limb-laterality recognition test, and quantitative sensory testing. In addition, psychological and pain assessment scales were completed. Tests were analyzed with univariate and multivariate approaches. After 6 months, patients were reassessed and the influence of NLS on pain outcome was determined. Most patients reported NLS in the questionnaire, whereas subjective visual midline and limb-laterality recognition test in contrast to previous studies did not reveal perceptual disturbances.

Neglect-like symptom scores were associated with pain and pain catastrophizing in acute CRPS and anxiety and thermal sensory loss in chronic CRPS. Furthermore, high NLS scores had a negative impact on pain outcome after 6 months.

Our results indicate that NLS have a different meaning in acute and chronic CRPS and might be of prognostic value. Possibly, treatment should focus on reducing NLS.

PMID: 29419655 DOI: 10.1097/j.pain.0000000000001173

**62 A. NUTRITION/VITAMINS****Cruciferous reduces mortality****Cruciferous vegetable intake and mortality in middle-aged adults: A prospective cohort study****Clinical Nutrition — | April 26, 2018****Mori N, et al.**

During this study, authors contemplated the correlation between cruciferous vegetable intake and all-cause mortality, namely cancer, heart disease, cerebrovascular disease, and injuries between 1990 and 1993 in Japan. Results demonstrated that a higher cruciferous vegetables intake was connected with reduced risk of all-cause mortality.

## Methods

- A total of 88,184 participants (age: 45-74 years) with no history of cancer, myocardial infarction, and stroke were enrolled.
- Follow-up was for a median of 16.9 years, during which 15,349 deaths were occurred.
- Using Cox proportional hazard regression analysis, the link between cruciferous vegetable intake and risk of all-cause and cause-specific mortality was assessed to calculate the hazard ratios (HRs) and 95% confidence intervals (CIs), after adjustment for potential confounding factors.

## Results

- Both gender reported an inverse correlation between cruciferous vegetable intake and total mortality.
- As per the data, HRs (95% CI) for all-cause mortality in the highest compared to the lowest quintile were 0.86 (0.80, 0.93) for men ( $P=0.0002$  for trend) and 0.89 (0.81, 0.98) for women ( $P=0.03$  for trend).
- It was deduced that cruciferous vegetable intake appeared to be related to lower cancer mortality in men, along with heart disease-, cerebrovascular disease-, and injury-related mortality in women.