

## 1. LUMBAR SPINE

### Neuroscience approach

Phys Ther. 2019 Jul 1;99(7):933-945. doi: 10.1093/ptj/pzz053.

#### **A Modern Pain Neuroscience Approach in Patients Undergoing Surgery for Lumbar Radiculopathy: A Clinical Perspective.**

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Around 20% of patients undergoing surgery for lumbar radiculopathy develop chronic pain after surgery, leading to high socioeconomic burden.

Current perioperative interventions, including education and rehabilitation, are not always effective in preventing prolonged or chronic postoperative pain and disability. Here, a shift in educational intervention from a biomedical towards a biopsychosocial approach for people scheduled for lumbar surgery is proposed. Pain neuroscience education (PNE) is a biopsychosocial approach that aims to decrease the threat value of pain by reconceptualizing pain and increasing the patient's knowledge about pain.

This paper provides a clinical perspective for the provision of perioperative PNE, specifically developed for patients undergoing surgery for lumbar radiculopathy. Besides the general goals of PNE, perioperative PNE aims to prepare the patient for postsurgical pain and how to cope with it.

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Antibiotic use and increase risk of CA

Cancer Med. 2019 Jul 16. doi: 10.1002/cam4.2412.

#### **Maternal use of antibiotics and cancer incidence risk in offspring: A population-based cohort study in Manitoba, Canada.**

Ye X<sup>1,2</sup>, Monchka BA<sup>1,3</sup>, Righolt CH<sup>1</sup>, Mahmud SM<sup>1,4,3</sup>.

Several epidemiological studies have found an association between maternal antibiotics use during pregnancy and increased risk of certain cancer types, although conclusions differ between studies.

We examined this association in a cohort study including 262 116 mother-child pairs of Manitoba births between 1996 and 2013. Maternal antibiotics use during prepregnancy (6 months prior to pregnancy) and pregnancy periods was assessed. Children's cancer incidence was tracked up to the end of the follow-up period (December 2015). We calculated incidence rate and used Cox regression to estimate adjusted hazard ratios (HRs). Antibiotics use during pregnancy was not associated with overall cancer (HR = 1.1, 95% confidence interval 0.9-1.4), leukemias (1.3, 0.9-1.8), or acute lymphocytic leukemia (1.1, 0.7-1.6).

The association between antibiotics use and overall cancer risk differed by trimester: 1.5 (1.1-1.9) in the first, 0.8 (0.6-1.0) in the second, and 1.1 (0.8-1.5) in the third trimester. Further research is necessary to confirm the association between first-trimester exposure and cancer risk after a better controlling of confounding factors.

## 8. VISCERA

### Skipping breakfast not healthy

#### Meta-Analysis of Relation of Skipping Breakfast With Heart Disease

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To determine whether skipping breakfast is associated with heart disease, the first meta-analysis of currently available epidemiological studies was performed.

To identify case-control, cross-sectional, longitudinal, or cohort studies investigating the association of skipping breakfast with prevalence, incidence, or mortality of heart disease in adults, PubMed, and Web of Science were searched through April 2019. Adjusted (if unavailable, unadjusted) hazard ratios (HRs) or odds ratios (ORs) with their confidence interval (CIs) of prevalence, incidence, or mortality for skipping breakfast were extracted from each study. Study-specific estimates were combined using inverse variance-weighted averages of logarithmic HRs/ORs in the random-effects model. Eight eligible studies with a total of 284,484 participants were identified and included in the present meta-analysis. The primary meta-analysis combining HRs for Q1 (first quartile, most skipping breakfast) versus Q4 (fourth quartile, least skipping breakfast) from 3 studies together with other HRs/ORs demonstrated that skipping breakfast was associated with the significantly increased risk of heart disease (pooled HR/OR 1.24; 95% CI 1.09 to 1.40;  $p = 0.001$ ). In sensitivity analyses combining HRs for Q2 (second quartile, second most skipping breakfast) versus Q4 or HRs for Q3 (third quartile, second least skipping breakfast) versus Q4 from 3 studies together with other HRs/ORs, the association of skipping breakfast with the increased risk of heart disease in the primary meta-analysis was confirmed.

In conclusion, skipping breakfast is associated with the increased risk of heart disease.

**Celiac's disease and changes in the brain**

*Clin Gastroenterol Hepatol.* 2019 Mar 16. pii: S1542-3565(19)30278-2. doi: 10.1016/j.cgh.2019.03.014.

**Neurologic Deficits in Patients With Newly Diagnosed Celiac Disease Are Frequent and Linked With Antibodies to Transglutaminase 6.**

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**BACKGROUND & AIMS:**

Celiac disease is an autoimmune disorder induced by ingestion of gluten that affects 1% of the population and is characterized by gastrointestinal symptoms, weight loss, and anemia. We evaluated the presence of neurologic deficits and investigated whether the presence of antibodies to TG6 increases the risk of neurologic defects in patients with a new diagnosis of celiac disease.

**METHODS:**

We performed a prospective cohort study at a secondary-care gastroenterology center of 100 consecutive patients who received a new diagnosis of celiac disease based on gastroscopy and duodenal biopsy. We collected data on neurologic history, and patients were evaluated in a clinical examination along with magnetic resonance imaging of the brain, magnetic resonance (MR) spectroscopy of the cerebellum, and measurements of antibodies against TG6 in serum samples. The first 52 patients recruited underwent repeat MR spectroscopy at 1 year after a gluten-free diet (GFD). The primary aim was to establish if detection of antibodies against TG6 can be used to identify patients with celiac disease and neurologic dysfunction.

**RESULTS:**

Gait instability was reported in 24% of the patients, persisting sensory symptoms in 12%, and frequent headaches in 42%. Gait ataxia was found in 29% of patients, nystagmus in 11%, and distal sensory loss in 10%. Sixty percent of patients had abnormal results from magnetic resonance imaging, 47% had abnormal results from MR spectroscopy of the cerebellum, and 25% had brain white matter lesions beyond that expected for their age group. Antibodies against TG6 were detected in serum samples from 40% of patients-these patients had significant atrophy of subcortical brain regions compared with patients without TG6 autoantibodies. In patients with abnormal results from MR spectroscopy of the cerebellum, those on the GFD had improvements detected in the repeat MR spectroscopy 1 year later.

**CONCLUSIONS:**

In a prospective cohort study of patients with a new diagnosis of celiac disease at a gastroenterology clinic, neurologic deficits were common and 40% had circulating antibodies against TG6. We observed a significant reduction in volume of specific brain regions in patients with TG6 autoantibodies, providing evidence for a link between autoimmunity to TG6 and brain atrophy in patients with celiac disease. There is a need for early diagnosis, increased awareness of the neurologic manifestations among clinicians, and reinforcement of adherence to a strict GFD by patients to avoid permanent neurologic disability.

### Impact of hypertension

#### **Effect of Systolic and Diastolic Blood Pressure on Cardiovascular Outcomes**

- Alexander C. Flint, M.D., Ph.D., and Deepak L. Bhatt, M.D., M.P.H.

#### **Abstract**

#### **BACKGROUND**

The relationship between outpatient systolic and diastolic blood pressure and cardiovascular outcomes remains unclear and has been complicated by recently revised guidelines with two different thresholds ( $\geq 140/90$  mm Hg and  $\geq 130/80$  mm Hg) for treating hypertension.

#### **METHODS**

Using data from 1.3 million adults in a general outpatient population, we performed a multivariable Cox survival analysis to determine the effect of the burden of systolic and diastolic hypertension on a composite outcome of myocardial infarction, ischemic stroke, or hemorrhagic stroke over a period of 8 years. The analysis controlled for demographic characteristics and coexisting conditions.

#### **RESULTS**

The burdens of systolic and diastolic hypertension each independently predicted adverse outcomes. In survival models, a continuous burden of systolic hypertension ( $\geq 140$  mm Hg; hazard ratio per unit increase in z score, 1.18; 95% confidence interval [CI], 1.17 to 1.18) and diastolic hypertension ( $\geq 90$  mm Hg; hazard ratio per unit increase in z score, 1.06; 95% CI, 1.06 to 1.07) independently predicted the composite outcome. Similar results were observed with the lower threshold of hypertension ( $\geq 130/80$  mm Hg) and with systolic and diastolic blood pressures used as predictors without hypertension thresholds. A J-curve relation between diastolic blood pressure and outcomes was seen that was explained at least in part by age and other covariates and by a higher effect of systolic hypertension among persons in the lowest quartile of diastolic blood pressure.

#### **CONCLUSIONS**

Although systolic blood-pressure elevation had a greater effect on outcomes, both systolic and diastolic hypertension independently influenced the risk of adverse cardiovascular events, regardless of the definition of hypertension ( $\geq 140/90$  mm Hg or  $\geq 130/80$  mm Hg).

## Fish consumption reduces risk of CR CA

Clin Gastroenterol Hepatol. 2019 Jun 25. pii: S1542-3565(19)30669-X. doi: 10.1016/j.cgh.2019.06.031.

**Consumption of Fish and Long-chain n-3 Polyunsaturated Fatty Acids Is Associated With Reduced Risk of Colorectal Cancer in a Large European Cohort.**

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Author information

Abstract

**BACKGROUND & AIMS:**

There is an unclear association between intake of fish and long-chain n-3 polyunsaturated fatty acids (n-3 LC-PUFAs) and colorectal cancer (CRC). We examined the association between fish consumption, dietary and circulating levels of n-3 LC-PUFAs, and ratio of n-6:n-3 LC-PUFA with CRC using data from the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort.

**METHODS:**

Dietary intake of fish (total, fatty/oily, lean/white) and n-3 LC-PUFA were estimated by food frequency questionnaires given to 521,324 participants in the EPIC study; among these, 6291 individuals developed CRC (median follow up, 14.9 years). Levels of phospholipid LC-PUFA were measured by gas chromatography in plasma samples from a sub-group of 461 CRC cases and 461 matched individuals without CRC (controls). Multivariable Cox proportional hazards and conditional logistic regression models were used to calculate hazard ratios (HRs) and odds ratios (ORs), respectively, with 95% CIs.

**RESULTS:**

Total intake of fish (HR for quintile 5 vs 1, 0.88; 95% CI, 0.80-0.96;  $P_{\text{trend}} = .005$ ), fatty fish (HR for quintile 5 vs 1, 0.90; 95% CI, 0.82-0.98;  $P_{\text{trend}} = .009$ ), and lean fish (HR for quintile 5 vs 1, 0.91; 95% CI, 0.83-1.00;  $P_{\text{trend}} = .016$ ) were inversely associated with CRC incidence. Intake of total n-3 LC-PUFA (HR for quintile 5 vs 1, 0.86; 95% CI, 0.78-0.95;  $P_{\text{trend}} = .010$ ) was also associated with reduced risk of CRC, whereas dietary ratio of n-6:n-3 LC-PUFA was associated with increased risk of CRC (HR for quintile 5 vs 1, 1.31; 95% CI, 1.18-1.45;  $P_{\text{trend}} < .001$ ). Plasma levels of phospholipid n-3 LC-PUFA was not associated with overall CRC risk, but an inverse trend was observed for proximal compared with distal colon cancer ( $P_{\text{heterogeneity}} = .026$ ).

**CONCLUSIONS:**

In an analysis of dietary patterns of participants in the EPIC study, we found regular consumption of fish, at recommended levels, to be associated with a lower risk of CRC, possibly through exposure to n-3 LC-PUFA. Levels of n-3 LC-PUFA in plasma were not associated with CRC risk, but there may be differences in risk at different regions of the colon.

**13 B. TMJ/ORAL****Periodontitis and cirrhosis**

J Clin Periodontol. 2019 Jul 23. doi: 10.1111/jcpe.13172.

**Periodontitis in individuals with liver cirrhosis: a case-control study.**

Costa FO<sup>1</sup>, Lages EJP<sup>2</sup>, Lages EMB<sup>1</sup>, Cota LOM<sup>1</sup>.

**AIM:**

The aim of this study was to evaluate the association between liver cirrhosis and periodontitis.

**METHODS:**

This case-control study included 294 individuals, 98 cases with liver cirrhosis and 196 controls. A full-mouth periodontal examination was performed and plaque index, probing depth, clinical attachment level and bleeding on probing were recorded. The association of risk variables with periodontitis was tested through univariate analysis and multivariate logistic regression, stratified by alcohol status.

**RESULTS:**

A high prevalence of periodontitis was observed among cases (62.2%) when compared to controls (41.8%). Individuals with cirrhosis presented a chance ~2 higher of having periodontitis than controls (OR=2.28; 95% CI 1.39-3.78;  $p<0.001$ ). Significant variables associated with periodontitis in the final logistic models were: a) no/occasional alcohol use model - number of teeth up 14, age  $\geq 45$ -55 years, male sex and smoking; b) moderate and intensive alcohol use models - cirrhosis, number of teeth up 14, age  $\geq 45$ -55 years, male sex and smoking.

**CONCLUSIONS:**

An important risk association between liver cirrhosis and periodontitis was observed. Additionally, the intensive alcohol use significantly increased the risk for periodontitis. This article is protected by copyright. All rights reserved

**13 D. SLEEP****Elderly sleep and health**

J Sleep Res. 2019 Jul 16:e12898. doi: 10.1111/jsr.12898.

**Longitudinal sleep efficiency in the elderly and its association with health.**

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The relationships between older age and sleep efficiency have traditionally been assessed using cross-sectional studies that ignore changes within individuals as they age.

This research examines the determinants of sleep efficiency, the heterogeneity in an individual's sleep efficiency trajectory across a period of up to 27 years in later life and its associations with health. The University of Manchester Longitudinal Study of Cognition in Normal Healthy Old Age cohort (n = 6,375; age 42-94 years) was used in this study. Depression and health data were collected using self-report validated instruments (Cornell Medical Index, Beck Depression Inventory and Geriatric Depression Scale). Longitudinal sleep and sociodemographic data were collected using a study-specific self-report questionnaire. A mixed-effect model was performed for sleep efficiency with adjustments for time-invariant and time-variant predictors. Latent class analysis was used to demonstrate subgroups of sleep efficiency trajectories and associations between sleep efficiency clusters and health history of the participants were investigated. Older adults have decreased sleep efficiency over time, with 18.6% decline between 40 and 100 years of age.

Three sleep efficiency trajectory clusters were identified: high (32%), medium (50%) and low sleep efficiency (18%).

Belonging to the high sleep efficiency cluster was associated with having lower prevalence of hypertension, circulatory problems, general arthritis, breathing problems and recurrent episodes of depression compared to the low efficiency cluster.

Overall, ageing decreases sleep efficiency. However, there are detectable subgroups of sleep efficiency that are related to prevalence of different diseases.



## 14. HEADACHES

## Protocols

*Eur J Pain.* 2019 Jul;23(6):1051-1070. doi: 10.1002/ejp.1374. Epub 2019 Feb 28.

**Non-pharmacological management of persistent headaches associated with neck pain: A clinical practice guideline from the Ontario protocol for traffic injury management (OPTIMa) collaboration.**

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**OBJECTIVES:**

To develop an evidence-based guideline for the non-pharmacological management of persistent headaches associated with neck pain (i.e., tension-type or cervicogenic).

**METHODS:**

This guideline is based on systematic reviews of high-quality studies. A multidisciplinary expert panel considered the evidence of clinical benefits, cost-effectiveness, societal and ethical values, and patient experiences when formulating recommendations. Target audience includes clinicians; target population is adults with persistent headaches associated with neck pain.

**RESULTS:**

When managing patients with headaches associated with neck pain, clinicians should (a) rule out major structural or other pathologies, or migraine as the cause of headaches; (b) classify headaches associated with neck pain as tension-type headache or cervicogenic headache once other sources of headache pathology has been ruled out; (c) provide care in partnership with the patient and involve the patient in care planning and decision making; (d) provide care in addition to structured patient education; (e) consider low-load endurance craniocervical and cervicoscapular exercises for tension-type headaches (episodic or chronic) or cervicogenic headaches >3 months duration; (f) consider general exercise, multimodal care (spinal mobilization, craniocervical exercise and postural correction) or clinical massage for chronic tension-type headaches; (g) do not offer manipulation of the cervical spine as the sole form of treatment for episodic or chronic tension-type headaches; (h) consider manual therapy (manipulation with or without mobilization) to the cervical and thoracic spine for cervicogenic headaches >3 months duration. However, there is no added benefit in combining spinal manipulation, spinal mobilization and exercises; and (i) reassess the patient at every visit to assess outcomes and determine whether a referral is indicated.

**CONCLUSIONS:**

Our evidence-based guideline provides recommendations for the conservative management of persistent headaches associated with neck pain. The impact of the guideline in clinical practice requires validation.

**SIGNIFICANCE:**

Neck pain and headaches are very common comorbidities in the population. Tension-type and cervicogenic headaches can be treated effectively with specific exercises. Manual therapy can be considered as an adjunct therapy to exercise to treat patients with cervicogenic headaches. The management of tension-type and cervicogenic headaches should be patient-centred.

## 18. CLAVICLE

### Conservative care of dislocations

#### Evolution of nonoperative treatment of atraumatic sternoclavicular dislocation

panel Robin Moreels MSc, Lieven De Wilde MD, PhD, Alexander Van Tongel MD, PhD

<https://doi.org/10.1016/j.jse.2019.04.060> Get rights and content

#### Background

Atraumatic sternoclavicular dislocation (ASCD) is an uncommon pathology that is mainly diagnosed in young adults. The aim of this study is to better describe the clinical picture of ASCD and to describe the results of a “wait-and-see” policy in these patients.

#### Methods

All patients with ASCD who visited our department between 2011 and 2016 were retrospectively analyzed. A standardized clinical examination was used to evaluate the clinical picture. All patients were treated nonoperatively, and at latest follow-up, several parameters and standardized questionnaires (Nottingham Clavicle Score, Oxford Shoulder Score, Constant-Murley Score) were used to evaluate the outcome.

#### Results

In total, 23 patients (12 male, 11 female) were evaluated. The average age at diagnosis was 18.6 years. There was a significant difference ( $P < .001$ ) in angle of dislocation during forward flexion (mean =  $141^\circ$ ) compared with abduction (mean =  $101^\circ$ ). At latest follow-up (average 46 months, range 14-113 months; standard deviation [SD] = 27), subluxations still occurred but were less frequent and less prominent relative to presentation at initial diagnosis in 19 of 23 patients. The chance of subjective improvement increased by 27% for each year of follow-up. High outcome scores of Nottingham Clavicle Score (mean score = 80, SD = 11), Oxford Shoulder Score (mean score = 44, SD = 4), and Constant-Murley Score (mean score = 83, SD = 11) were reported.

#### Conclusion

In patients with ASCD, the clavicle subluxates earlier in abduction than in forward flexion. After a midterm follow-up, a “wait-and-see” policy does not resolve the subluxations. However, most patients displayed reduced frequency and severity of subluxations over their recovery period and showed excellent scores on shoulder questionnaires. Level of evidence Level IV Case Series Treatment Study

**35. KNEE/TOTAL****Hip dysplasia total helps alignment**

J Arthroplasty. 2019 Apr 20. pii: S0883-5403(19)30396-1. doi: 10.1016/j.arth.2019.04.028.

**Effects of Postoperative Total Hip Arthroplasty on Axial Alignment of the Lower Limb in Patients with Unilateral Developmental Hip Dysplasia (Crowe type IV).**

Zhao HY<sup>1</sup>, Kang PD<sup>2</sup>, Shi XJ<sup>2</sup>, Zhou ZK<sup>2</sup>, Yang J<sup>2</sup>, Shen B<sup>2</sup>, Pei FX<sup>2</sup>.

*BACKGROUND:*

The aim of this study was to evaluate the influence of total hip arthroplasty on axial alignment of the lower limb in adults with unilateral developmental hip dysplasia (Crowe type IV).

*METHODS:*

We retrospectively reviewed medical records of 50 adults who underwent total hip arthroplasty, in which the acetabular cup was placed in the anatomical position. The following parameters were measured before surgery, immediately after surgery, and two years later: mechanical axis deviation (MAD), tibiofemoral angle (TFA), femoral offset, hip-knee-ankle angle (HKA), mechanical lateral distal femoral angle (LDFA), mechanical medial proximal tibial angle, height of medial femoral condyle, height of lateral femoral condyle, and leg lengthening. Length of the resected femoral segment was also recorded from medical records.

*RESULTS:*

Preoperative MAD, TFA, HKA, and LDFA of the ipsilateral lower limb showed significant valgus deformity. MAD of the ipsilateral lower limb and valgus inclination were significantly smaller immediately after surgery than before, while TFA, HKA, femoral offset, and LDFA were significantly larger ( $P < 0.05$ ). These parameters did not differ significantly between immediately after surgery and two years later ( $P > 0.05$ ). Ipsilateral extremities were extended by a mean of 2.54 cm (range, 0 to 5.35 cm). The mean length of the femoral resected segment was 3.56 cm (range, 2.03 to 5.74 cm). The contralateral lower limb showed marginally smaller MAD and medial proximal tibial angle after surgery than before, but larger LDFA, TAF, and HKA.

*CONCLUSIONS:*

In patients with developmental hip dysplasia who underwent total hip arthroplasty with placement of the acetabular component at the level of the anatomic hip center, axial alignment of the ipsilateral lower limb was immediately altered, and valgus inclination was significantly reduced. The procedure only slightly altered the axial alignment of the contralateral lower limb.

**Patella resurfacing reviewed**

J Bone Joint Surg Am. 2012 Dec 19;94(24):2270-8. doi: 10.2106/JBJS.K.01257.

**Patellar resurfacing in primary total knee replacement: a meta-analysis.**

Pilling RW<sup>1</sup>, Moulder E, Allgar V, Messner J, Sun Z, Mohsen A.

**BACKGROUND:**

Treatment of the patella during total knee replacement is an area of continuing debate. We performed a meta-analysis of randomized controlled trials to address the hypothesis that patellar resurfacing in primary total knee replacement improved patient outcome.

**METHODS:**

Randomized controlled trials comparing patellar resurfacing with nonresurfacing in primary total knee replacement were included. The primary outcomes analyzed were knee scores, anterior knee pain, and patient satisfaction. We also investigated the prevalence of complications, revision surgery related specifically to the patellofemoral joint, the infection rate, operative time, and radiographic appearance.

**RESULTS:**

Sixteen randomized controlled trials assessing 3465 knee replacements were eligible; 1710 procedures included patellar resurfacing and 1755 did not. The knee component of the Knee Society Score was significantly higher in the resurfacing group ( $p = 0.005$ ); however, no significant difference was observed for the function component of the Knee Society Score or for any other reported knee score. Anterior knee pain was reported in 13% of resurfaced knees and in 24% of nonresurfaced knees; this difference was not significant ( $p = 0.1$ ). Patients were satisfied with the outcome after 485 (90%) of 539 procedures that included patellar resurfacing compared with 488 (89%) of 548 that did not; this difference was not significant. There were ninety-three reported patellofemoral complications in the resurfacing group and 205 in the nonresurfacing group; this difference was significant ( $p = 0.02$ ) in a random-effect model. The rate of reoperation because of anterior knee pain ( $p < 0.00001$ ) and the rate of reoperation because of any patellofemoral complication ( $p = 0.002$ ) were significantly higher in the nonresurfaced group. No differences were found in the analyses of infection rate, operative time, or radiographic appearance.

**CONCLUSIONS:**

Patients who underwent patellar resurfacing experienced anterior knee pain and satisfaction with the arthroplasty procedure that were equivalent to those experienced by patients whose patella was not resurfaced; however, these patients underwent significantly fewer additional surgical procedures. Further long-term follow-up of modern prostheses in randomized studies measuring outcome with a patella-specific score is needed.

**37. OSTEOARTHRITIS/KNEE****Unloading brace****Effects of a knee valgus unloader brace on medial femoral articular cartilage deformation following walking in varus-aligned individuals**

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<https://doi.org/10.1016/j.knee.2019.06.014>Get rights and content

**Background**

Knee varus alignment may increase loading in the medial tibiofemoral compartment, which can increase strain on the articular cartilage. Knee valgus unloader braces seek to reduce loading through the medial femoral compartment, but their effects on cartilage characteristics during dynamic tasks have not been evaluated.

**Objective**

To determine the effects of a knee valgus unloader brace on medial femoral articular cartilage deformation following a single 5000-step walking protocol in individuals with varus-knee alignment.

**Methods**

Twenty-four healthy individuals (63% female, BMI =  $22 \pm 3$  kg/m<sup>2</sup>, age =  $21 \pm 3$  years) completed two testing sessions (braced and unbraced) separated by one week. During both sessions, femoral cartilage ultrasound images were acquired prior to and following a 5000-step treadmill walking protocol at self-selected speed. Percent change scores in medial cartilage cross-sectional area (MCCA) were calculated and used as the primary outcome, and compared between the braced and unbraced conditions.

**Results**

There was no difference in percent change of MCCA between conditions (braced = - 2.77%, unbraced = - 3.15%,  $p = 0.699$ ). Individuals whose cartilage deformed more than a previously established minimal detectable change ( $MDC \geq 1.58$  mm<sup>2</sup>) deformed less during the braced condition (braced = - 2.94%, unbraced = - 6.34%,  $p = 0.028$ ), compared to individuals who did not deform greater than the MDC ( $n = 15$ , braced = - 2.67%, unbraced = - 1.23%,  $p = 0.210$ ).

**Conclusions**

There was no significant difference in MCCA percent change between the braced and unbraced conditions across the entire cohort; yet a valgus unloader braces may serve as a potential intervention strategy for reducing articular cartilage deformation in certain varus-aligned individuals who normally undergo measurable deformation during walking.

**40. ANKLE SPRAINS AND INSTABILITY****Tai Chi helps ankle instability**

J Sport Rehabil. 2019 Jun 13:1-6. doi: 10.1123/jsr.2018-0222.

**Effects of 12 Weeks of Tai Chi Intervention in Patients With Chronic Ankle Instability: A Randomized Controlled Trial.**

Cruz-Díaz D, Kim KM, Hita-Contreras F, Bergamin M, Aibar-Almazán A, Martínez-Amat A.

**Context:** Tai Chi is a physical activity modality which is widely practiced over the world. The effectiveness of Tai Chi on postural control and balance has been described in older population, but until recently there are no studies that include patients with chronic ankle instability.

**Objectives:** The aim of this study was to evaluate the effectiveness of 12 weeks of Tai Chi intervention on dynamic balance and self-reported instability in patients with chronic ankle instability. **Study Design:** A randomized controlled trial was carried out.

**Setting:** University physical therapy facility. **Participants:** Fifty-two participants were allocated to an intervention group (n = 26) based on Tai Chi training or a control group (n = 26) who received no intervention.

**Intervention:** The participants completed 12 weeks of Tai Chi intervention (1 h session/2 times per week) or no intervention in the control group.

**Main Outcome Measures:** Outcome measures included postural control and self-reported instability feeling assessed by the Star Excursion Balance Test and the Cumberland Ankle Instability Tool, respectively.

**Results:** There was observed significant improvement in all Star Excursion Balance Test reach distances (anterior [ $F = 6.26, P < .01$ ]; posteromedial [ $F = 9.58, P < .01$ ], and posterolateral [ $F = 8.42, P < .01$ ]) in the Tai Chi group with no change in the control group ( $P < .01$ ). The intervention group demonstrated significant improvement on self-reported instability feeling assessed by the Cumberland Ankle Instability Tool questionnaire ( $F = 21.36, P < .01$ ).

**Conclusion:** The obtained results suggested that 12 weeks of Tai Chi intervention have positive effects on postural control and self-reported instability feeling in patients with chronic ankle instability.

**Exercise helps reinjury**

Arch Phys Med Rehabil. 2019 Jul;100(7):1367-1375. doi: 10.1016/j.apmr.2018.10.005. Epub 2018 Oct 26.

**Rehabilitation Exercises Reduce Reinjury Post Ankle Sprain, But the Content and Parameters of an Optimal Exercise Program Have Yet to Be Established: A Systematic Review and Meta-analysis.**

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**OBJECTIVES:**

To determine if exercise-based rehabilitation reduces reinjury following acute ankle sprain. Our secondary objective was to assess if rehabilitation efficacy varies according to exercise content and training volume.

**DATA SOURCES:**

The following electronic databases were searched: EMBASE, MEDLINE, the Cochrane Central Register of Controlled Trials, and Physiotherapy Evidence Database (PEDro).

**STUDY SELECTION:**

Randomized controlled trials investigating the effect of exercise-based rehabilitation programs on reinjury and patient-reported outcomes (perceived instability, function, pain) in people with an acute ankle sprain. No restrictions were made on the exercise type, duration, or frequency. Exercise-based programs could have been administered in isolation or as an adjunct to usual care. Comparisons were made to usual care consisting of 1 or all components of PRICE (protection, rest, ice, compression, elevation).

**DATA EXTRACTION:**

Effect sizes with 95% CIs were calculated in the form of mean differences for continuous outcomes and odds ratios (ORs) for dichotomous outcomes. Pooled effects were calculated for reinjury prevalence with meta-analysis undertaken using RevMan software.

**DATA SYNTHESIS:**

Seven trials (n=1417) were included (median PEDro score, 8/10). Pooled data found trends toward a reduction in reinjury in favor of the exercise-based rehabilitation compared with usual care at 3-6 months (OR, 0.87; 95% CI, 0.48-1.58) with significant reductions reported at 7-12 months (OR, 0.53; 95% CI, 0.38-0.73). Sensitivity analysis based on pooled reinjury data from 2 high quality studies (n=629) also found effects in favor of exercise-based rehabilitation at 12 months (OR, 0.60; 95% CI, 0.49-0.89). Training volume differed substantially across rehabilitation programs with total rehabilitation time ranging from 3.5-21 hours. The majority of rehabilitation programs focused primarily on postural balance or strength training.

**CONCLUSIONS:**

Exercise-based rehabilitation reduces the risk of reinjury following acute ankle sprain when compared with usual care alone. There is no consensus on optimal exercise content and training volume in this field. Future research must explicitly report all details of administered exercise-based rehabilitation programs.

**45 A. MANUAL THERAPY LUMBAR & GENERAL****Visual assessment appears to be clinically effective**

BMJ Open Sport Exerc Med. 2019; 5(1): e000541.  
Publidoi: 10.1136/bmjsem-2019-000541 PMCID: PMC6579566 PMID: 31275606

**Visual assessment of movement quality in the single leg squat test: a review and meta-analysis of inter-rater and intrarater reliability**

John Ressman,<sup>1</sup> Wilhelmus Johannes Andreas Grooten,<sup>1,2</sup> and Eva Rasmussen Barr<sup>1</sup>

Single leg squat (SLS) is a common tool used in clinical examination to set and evaluate rehabilitation goals, but also to assess lower extremity function in active people.

**Objectives** To conduct a review and meta-analysis on the inter-rater and intrarater reliability of the SLS, including the lateral step-down (LSD) and forward step-down (FSD) tests.

**Design** Review with meta-analysis.

**Data sources** CINAHL, Cochrane Library, Embase, Medline (OVID) and Web of Science was searched up until December 2018.

**Eligibility criteria** Studies were eligible for inclusion if they were methodological studies which assessed the inter-rater and/or intrarater reliability of the SLS, FSD and LSD through observation of movement quality.

**Results** Thirty-one studies were included. The reliability varied largely between studies (inter-rater: kappa/intraclass correlation coefficients (ICC) = 0.00–0.95; intrarater: kappa/ICC = 0.13–1.00), but most of the studies reached ‘moderate’ measures of agreement. The pooled results of ICC/kappa showed a ‘moderate’ agreement for inter-rater reliability, 0.58 (95% CI 0.50 to 0.65), and a ‘substantial’ agreement for intrarater reliability, 0.68 (95% CI 0.60 to 0.74). Subgroup analyses showed a higher pooled agreement for inter-rater reliability of  $\leq 3$ -point rating scales while no difference was found for different numbers of segmental assessments.

**Conclusion** Our findings indicate that the SLS test including the FSD and LSD tests can be suitable for clinical use regardless of number of observed segments and particularly with a  $\leq 3$ -point rating scale. Since most of the included studies were affected with some form of methodological bias, our findings must be interpreted with caution.



**51. CFS/BET****Neck and shoulder pain**

Eur J Pain. 2019 Jul;23(6):1141-1152. doi: 10.1002/ejp.1381. Epub 2019 Mar 11.

**Comparing the effectiveness of integrating ergonomics and motor control to conventional treatment for pain and functional recovery of work-related neck-shoulder pain: A randomized trial.**

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**BACKGROUND:**

Work-related neck and shoulder pain (WRNSP) is highly prevalent among patients who seek physiotherapy treatment. Clinicians may tend to focus on teaching home exercises and provide general advice about workplace improvement. The present study investigates the short- and long-term impact of an intervention approach that emphasizes on integrating the motor control re-education with ergonomic advice.

**METHODS:**

Participants diagnosed with WRNSP (n = 101) were randomly assigned into two groups in this randomized controlled trial. The Ergo-motor Group (EM, n = 51) received an integrated intervention with ergonomic advice/modifications and motor control training individualized for each participant based on their specific work demands. Control Group (CO, n = 50) received treatment for pain relief and general exercises of their necks at a designated physiotherapy clinic. Neck pain intensity and functional outcome measures were assessed before, immediately and 1-year after the 12-week intervention programmes. Global Rating of Change Score was used to evaluate the perceived recovery at 1-year follow-up.

**RESULTS:**

Both groups reported significant reductions in pain and functional disability scores at post-intervention (EM, n = 44; CO, n = 42) and 1-year follow-up (EM, n = 40; CO, n = 38); however, no significant between-group differences were found ( $p > 0.05$ ). Significantly higher rating in global recovery score was reported in EM group at 1-year follow-up ( $p < 0.05$ ).

**CONCLUSIONS:**

Intervention integrating ergonomic advice/modification with motor control exercise was found to be equally effective as pain relief and general exercise for pain and functional recovery. However, at 1-year follow-up, such integrated approach resulted in significantly better global recovery perceived by people with WRNSP.

**SIGNIFICANCE:**

Integrating ergonomic intervention and motor control training achieved similar reduction in pain and functional outcomes compared to conventional physiotherapy at post-intervention and at 1-year follow-up, for patients with moderate level of work-related neck-shoulder pain and mild degree of functional disability. The Ergo-motor Group reported significantly better perceived overall recovery at 1-year follow-up.

## 52. EXERCISE

### Ex and cognitive function

#### Impact of exercise training on physical and cognitive function among older adults: a systematic review and meta-analysis

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<https://doi.org/10.1016/j.neurobiolaging.2019.03.007>Get rights and content

#### Highlights

- Maintaining physical and cognitive function is critical for healthy aging.
- Physical function and cognitive function are linked and share common mechanisms.
- Exercise training improves physical function and cognitive function.
- Exercise-induced improvements in physical and cognitive function are associated.

#### Abstract

Exercise plays a key role in healthy aging by promoting both physical and cognitive function. Physical function and cognitive function appear to be interrelated and may share common mechanisms. Thus, exercise-induced improvements in physical function and cognitive function may co-occur and be associated with each other. However, no systematic review has specifically assessed and compared the effects of exercise on both physical function and cognitive function in older adults, and the association between changes in both outcomes after exercise training. Thus, we conducted a systematic review and meta-analysis (N = 48 studies) among older adults (60+ years). These data suggest exercise training has a significant benefit for both physical function ( $g = 0.39$ ;  $p < 0.001$ ) and cognitive function ( $g = 0.24$ ;  $p < 0.001$ ). At the study level, there was a positive correlation between the size of the exercise-induced effect on physical function and on cognitive function ( $b = 0.41$ ;  $p = 0.002$ ).

Our results indicate exercise improves both physical and cognitive function, reiterating the notion that exercise is a panacea for aging well.

54. POSTURE

Directed exercise helps kyphosis in elderly

**Effects of Corrective Exercise for Thoracic Hyperkyphosis on Posture, Balance, and Well-Being in Older Women**

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doi: 10.1519/JPT.000000000000146

- Background and Purpose:** The purpose of this study was to identify the effects of a corrective exercise for thoracic hyperkyphosis on posture, balance, and well-being in Korean community-dwelling older women.

**Methods:** Fifty women 65 years of age and older, recruited from 2 senior centers, participated in this study. Participants were assigned to either the experimental group (EG) or the control group (CG) on the basis of convenience of location, and 22 in each were analyzed. Participants in the EG underwent a thoracic corrective exercise program 1 hour each session, twice per week for 8 weeks (a total of 16 sessions), which consisted of specific exercises to enhance breathing, thoracic mobility and stability, and awareness of thoracic alignment. The CG received education on the same thoracic corrective exercise program and a booklet of the exercises. Outcome measures included the extent of postural abnormality (angle of thoracic kyphosis, kyphosis index calculated both in relaxed- and best posture using flexicurve, the ratio of the kyphosis index calculated best posture/relaxed posture, craniovertebral angle, and tragus-to-wall distance), balance (Short Physical Performance Battery and limit of stability), and well-being (Geriatric Depression Scale Short Form and the 36-Item Short Form Health Survey [SF-36]). All data were collected by 6 blinded assessors at baseline, at 8 weeks after the completion of intervention, and at 16 weeks for follow-up.

**Results and Discussion:** For participants of the EG, means of all parameters showed significant improvements over time ( $P < .05$ ), with improved values both in comparison of baseline to postintervention and baseline to follow-up. Means of CG parameters were significantly improved in only the angle of thoracic kyphosis and the tragus-to-wall distance ( $P < .05$ ). Furthermore, in all parameters, percent change between baseline and postintervention data was significantly ( $P < .05$ ) higher for the EG than that for the CG, except for the limit of stability and SF-36 which improved but not significantly. All parameters between baseline and follow-up data were significantly ( $P < .05$ ) higher for the EG than those for the CG, except for the limit of stability.

**Conclusions:** The findings of this study suggest that a well-designed exercise program may be beneficial to improve spinal posture, balance, and well-being in older women with thoracic hyperkyphosis. We recommend the use of the therapeutic strategies utilized in this study to enhance thoracic posture, balance, and well-being of older women with thoracic hyperkyphosis. Future research is needed to apply this exercise protocol on a larger and more diverse population.

## 55. SCOLIOSIS

### Bracing helps

European Spine Journal

#### **Treatment of bracing for adolescent idiopathic scoliosis patients: a meta-analysis**

Yuhao Zhang Xingwei Li

#### Purpose

A meta-analysis was conducted to compare the efficacy and safety of bracing and other treatments in adolescent idiopathic scoliosis (AIS) patients.

#### Methods

PubMed, Embase, and Cochrane Central Register of Controlled Trials were searched for randomized controlled trials that investigated bracing and other treatments for AIS. The Mantel–Haenszel method with fixed-effects or random-effects model was used to calculate the relative risks and 95% confidence intervals (CIs). The results of heterogeneity, sensitivity analysis, and publication bias were analyzed.

#### Results

Seven studies that met the eligibility criteria with 791 participants were included. The results of meta-analysis suggested significant differences between bracing and observation groups in successful outcomes [OR 3.58, 95% CI (1.92, 6.68),  $P < 0.0001$ ;  $P$  for heterogeneity = 0.008,  $I^2 = 65\%$ ], quality of life [MD = 2.13, 95% CI (0.51, 3.75),  $P = 0.01$ ;  $P$  for heterogeneity = 0.89,  $I^2 = 0\%$ ], and adverse events [OR 5.31, 95% CI (2.42, 11.66),  $P < 0.0001$ ;  $P$  for heterogeneity = 0.78,  $I^2 = 0\%$ ].

#### Conclusion

The findings of this meta-analysis suggested that bracing is efficient and safe for the treatment of AIS.