

## ABSTRACTS

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### 2. LBP

#### Trauma exposure and LBP

##### **Trauma exposure and pain severity among people with chronic lower back pain: moderated mediation by thought suppression and social constraints**

The Journal of Pain, 05/11/2016Pegram S, et al.

**R**esearch links lifetime frequency of traumatic events to chronic pain severity. Attempts to suppress intrusive thoughts about trauma can paradoxically result in increased rumination, distress, and, potentially, pain. Unfortunately, however, many trauma-exposed individuals experience social constraints (e.g., social reactions that minimize the person's problems or discourage expression), which might result in thought and emotion suppression and increased distress and pain. The authors examined these cognitive and social mechanisms through which trauma exposure can affect pain severity.

**Clinical instability****The Relationship Between Clinical Instability and Endurance Tests, Pain, and Disability in Nonspecific Low Back Pain**

Carla Vanti, MSc, PT, OMT Cristina Conti, PT Federica Faresin, PT, OMT Silvano Ferrari, PTRaffaella Piccarreta, PhD

**Abstract****Objective**

The aims of this study were (1) to investigate the relationship between clinical tests detecting spinal instability and the perceived pain and disability in nonspecific low back pain and (2) to investigate the relationship between endurance and instability tests.

**Methods**

Four instability tests (aberrant movements, active straight leg raising, prone instability test, and passive lumbar extension test) and 2 endurance tests (prone bridge test [PBT] and supine bridge test [SBT]) were performed on 101 participants. Their results were compared with the Numerical Rating Scale and the Oswestry Disability Index evaluating pain and disability, respectively.

**Results**

A low to moderate significant relationship between pain, disability, and all tests with the exception of PBT was observed. A low to moderate significant relationship between endurance tests and instability tests was also shown. The results of PBT and SBT were significantly related to the duration of symptoms ( $P = .0014$  and  $P = .0203$ , respectively).

**Conclusion**

The results of endurance and instability tests appear to be related to the amount of pain and the disability in nonspecific low back pain. The persistence of pain significantly reduces anterior and posterior core muscle endurance.

Key Indexing Terms: Joint Instability, Musculoskeletal Diseases, Physical Examination, Low Back Pain, Physical Endurance

### 3. DISC

DJD

Lasers Med Sci. 2016 May;31(4):767-77. doi: 10.1007/s10103-016-1923-x. Epub 2016 Mar 17.

**Photobiomodulation on human annulus fibrosus cells during the intervertebral disk degeneration: extracellular matrix-modifying enzymes.**

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Destruction of extracellular matrix (ECM) leads to degeneration of the intervertebral disk (IVD), which is a major contributor to many spine disorders. IVD degeneration is induced by pro-inflammatory cytokines, such as tumor necrosis factor-alpha (TNF- $\alpha$ ) and interleukin-1 beta (IL-1 $\beta$ ), which are secreted by immune cells, including macrophages and neutrophils.

The cytokines modulate ECM-modifying enzymes such as matrix metalloproteinases (MMPs) and tissue inhibitors of metalloproteinases (TIMPs) in human annulus fibrosus (AF) cells. The resulting imbalance in catabolic and anabolic enzymes can cause generalized back, neck, and low back pain (LBP). Photobiomodulation (PBM) is known to regulate inflammatory responses and wound healing. The aim of this study was to mimic the degenerative IVD microenvironment, and to investigate the effect of a variety of PBM conditions (wavelength: 635, 525, and 470 nm; energy density: 16, 32, and 64 J/cm(2)) on the production of ECM-modifying-enzymes by AF cells under degenerative conditions induced by macrophage-conditioned medium (MCM), which contains pro-inflammatory cytokines such as TNF- $\alpha$  and IL- $\beta$  secreted by macrophage during the development of intervertebral disk inflammation.

We showed that the MCM-stimulated AF cells express imbalanced ratios of TIMPs (TIMP-1 and TIMP-2) and MMPs (MMP-1 and MMP-3). PBM selectively modulated the production of ECM-modifying enzymes in AF cells. These results suggest that PBM can be a therapeutic tool for degenerative IVD disorders.

**KEYWORDS:** Extracellular matrix; Human annulus fibrosus; Inflammation; Intervertebral disk degeneration; Photobiomodulation

PMID: 26987527

## Types of discs

Spine J. 2016 May 5. pii: S1529-9430(16)30095-X. doi: 10.1016/j.spinee.2016.04.020.

**Two subtypes of intervertebral disc degeneration distinguished by large-scale population-based study.**

Li Y<sup>1</sup>, Samartzis D<sup>2</sup>, Campbell D<sup>1</sup>, Cherny S<sup>1</sup>, Cheung KM<sup>3</sup>, Luk KD<sup>3</sup>, Karppinen J<sup>4</sup>, Song Y<sup>5</sup>, Cheah K<sup>5</sup>, Chan D<sup>5</sup>, Sham PC<sup>6</sup>.

Author information

## Abstract

**BACKGROUND:** Lumbar disc degeneration (LDD) is a major cause of low back pain, and is a common and disabling condition worldwide. LDD has been defined and measured by multiple spine MRI features, but the heterogeneity among them has never been fully addressed.

**PURPOSE:** This study examined the inter-correlations, risk factor associations, and SNP-heritabilities of lumbar disc MRI features, in a large-scale sample to classify the different intervertebral disc phenotypes associated with LDD.

**STUDY DESIGN:** A cross-sectional study was conducted consisting of 2,943 volunteers of Southern Chinese origin (mean age, 41.1 years; range, 15 to 55 years; 59.6% females).

**OUTCOME MEASURES:** Magnetic resonance imaging (MRI) phenotypic spinal patterns and their risk factor profiles in relation to developmental or degenerative origins of disc degeneration.

**METHODS:** Sagittal T2-weighted MRI of the lumbar spine from L1-S1 was assessed. MRI features of lumbar intervertebral disc changes, such as disc signal intensity loss, disc bulges or extrusions, as well as additional imaging phenotypes of endplate changes, high-intensity zones, and bone marrow changes were evaluated. Blood samples were taken for genotyping using the Human Omni-ZhongHua-8 Bead Chip. Subject demographics, environmental and lifestyle factors were assessed by questionnaires. Multivariate statistical techniques were used for phenotypes evaluation. Polychoric correlations and local regression statistical analyses were performed. The genetic components contributed by common SNPs were estimated by comparing genetic correlations and phenotypic correlations using Genome-wide Complex Trait Analysis (GCTA) tool.

**RESULTS:** The study noted that lumbar disc MRI features separated into two groups with differential patterns of risk factor associations. A subset of lumbar disc abnormalities including endplate changes but also upper lumbar disc bulging and signal intensity loss may have a developmental origin. Subsequent degenerative changes, typically affecting the lower lumbar discs, then emerge as individuals age and are associated with BMI.

**CONCLUSIONS:** This is the first large-scale study to identify two distinct patterns of lumbar disc alterations, noting degenerative changes and a possible developmental component affecting the lumbar spine. This new classification provides a starting point for a more homogeneous phenotype definition, which may provide greater statistical power and precision in future genetic and epidemiological studies. In addition, such insights may have direct clinical implications in the prevention, therapeutics and prognostics of patients with disc degeneration.

**KEYWORDS:** MRI; degeneration; development; disc; genetics; intervertebral; lumbar; risk factors

PMID: 27157501

**Facet tropisms affect on the disc****Facet tropism and facet joint orientation: risk factors for the development of early biochemical alterations of lumbar intervertebral discs**

Christoph Schleich, M Anja Müller-Lutz, PhD Katrin Blum, MD Johannes Boos, MD Bernd Bittersohl, MD Benjamin Schmitt, PhD Joachim Gerss, PhD Felix Matuschke Hans-Jörg Wittsack, PhD (Prof.) Gerald Antoch, MD (Prof.) Falk Miese, MD

**Summary****Objective**

To assess the glycosaminoglycan (GAG) content of lumbar intervertebral discs (IVD) in healthy volunteers with facet tropism (FT) and sagittal facet joint (FJ) orientation using glycosaminoglycan chemical exchange saturation transfer imaging (gagCEST).

**Method**

Seventy-five lumbar IVDs of twenty-five young, healthy volunteers without any history of lumbar spine pathologies (13 female; 12 male; mean age:  $28.0 \pm 4.4$  years; range: 21 - 35 years) were examined with a 3T MRI scanner. Orientation of FT and FJ were assessed for L3/4, L4/5 and L5/S1 using standard T2 weighted images. Biochemical gagCEST imaging was used to determine the GAG content of each nucleus pulposus (NP) and annulus fibrosus (AF).

**Results**

Significantly higher gagCEST values of NP were found in volunteers without FT and normal FJ orientation compared to volunteers with FT and sagittal FJ orientation  $> 45^\circ$  ( $p < 0.0001$ ). GagCEST values were significantly higher in volunteers without FT compared to volunteers with moderate or severe FT (moderate FT:  $p < 0.0001$ ; severe FT:  $p = 0.0033$ ). Volunteers with normal FJ orientation showed significantly higher gagCEST values compared to those with sagittal FJ orientation  $> 45^\circ$  ( $p < 0.001$ ). We found a significant, negative correlation between gagCEST values and higher angles in sagittal FJ orientation ( $\rho = -0.459$ ;  $p < 0.0001$ ).

**Conclusion**

GagCEST analysis indicated lower GAG values of NP in young volunteers with FT and sagittal orientated FJ, indicating that FT and sagittal orientation of the FJ represent risk factors for the development of early biochemical alterations of lumbar IVDs.

Keywords: glycosaminoglycan chemical exchange saturation transfer, facet tropism, facet orientation, intervertebral discs, MRI

## 5. SURGERY

### Fusion/adjacent segment

Int Orthop. 2016 Apr 27.

#### **Interspinous dynamic stabilization adjacent to fusion versus double-segment fusion for treatment of lumbar degenerative disease with a minimum follow-up of three years.**

Chen XL<sup>1</sup>, Guan L<sup>1</sup>, Liu YZ<sup>1</sup>, Yang JC<sup>1</sup>, Wang WL<sup>1</sup>, Hai Y<sup>2</sup>.

Author information

Abstract

#### **PURPOSE:**

The aim of this study was to assess the outcome of symptomatic lumbar degenerative disease treated with topping-off technique (Coflex™ combined with fusion) and compare two-segment fusion at mid-long term follow-up; and find out whether the topping-off technique can reduce the rate of adjacent segment degeneration (ASD) after fusion.

#### **METHODS:**

One hundred and fifty-four consecutive patients who received topping-off surgery (76 patients) and two-segment fusion surgery (88 patients) from March 2009 to March 2012 were studied. All patients included in the analysis had a minimum of three years of follow-up. Radiographic and clinical outcomes between the two groups were compared. A logistic regression analysis was used to analyze risk factors for developing radiographic ASD.

#### **RESULTS:**

Significant differences in clinical outcomes were observed between these two groups at three post-operative years (all,  $p < 0.05$ ). Compared with the fusion group, the topping-off group showed preserved mobility at the Coflex™ level ( $p = 0.000$ ), which is associated with less blood loss ( $p = 0.000$ ), shorter duration of surgery ( $p = 0.000$ ) and lower incidence of ASD (Chi-square test, rate topping-off vs fusion = 13.2 vs 26.1 %,  $p = 0.039$ ). There were no differences in complications between the two groups.

#### **CONCLUSION:**

Mid-long term follow-up efficacy and safety between topping-off and fusion were similar, while topping-off reduced the rate of ASD. Under strict indications, topping-off surgery is an acceptable alternative to fusion surgery for the treatment of two-segment lumbar disease.

## 7. PELVIC ORGANS/WOMAN'S HEALTH

### Birth control and stroke

Contraception. 2016 May 3. pii: S0010-7824(16)30051-8. doi: 10.1016/j.contraception.2016.04.016.

#### **Safety of hormonal contraceptives among women with migraine: a systematic review.**

Tepper NK<sup>1</sup>, Whiteman MK<sup>2</sup>, Zapata LB<sup>2</sup>, Marchbanks PA<sup>2</sup>, Curtis KM<sup>2</sup>.  
Author information

#### Abstract

##### **BACKGROUND:**

Migraine is common among women of reproductive age and is associated with an increased risk of ischemic stroke. Combined oral contraceptives (COCs) are also associated with an increased risk of ischemic stroke. Use of hormonal contraception among women with migraine might further elevate the risk of stroke among women of reproductive age.

##### **OBJECTIVE:**

To identify evidence regarding the risk of arterial thromboembolism (stroke or myocardial infarction) among women with migraine who use hormonal contraceptives.

##### **METHODS:**

We searched the PubMed database for all articles published from database inception through January 2016. We included studies that examined women with migraine overall or separated by subtype (with or without aura). Hormonal contraceptives of interest included combined hormonal methods (COCs, patch, and ring) and progestin-only methods (progestin-only pills, injectables, implants, and progestin intrauterine devices).

##### **RESULTS:**

Seven articles met inclusion criteria. All were case-control studies of fair to poor quality reporting on use of COCs or oral contraceptives (OCs) not further described and all reported stroke outcomes. Four studies demonstrated that, among women with migraine (not separated by subtype), COC use was associated with approximately 2-4 times the risk of stroke compared with non-use. The only study to examine specific migraine subtypes found an elevated risk of stroke among women with migraine with aura, and this risk was similar regardless of OC use, although these odds ratios were not reported. Two studies did not report risks among women with migraine and COC use combined, but both found increased risks of stroke with migraine and COC use independently. No evidence was found on other hormonal contraceptives or on risk of myocardial infarction.

##### **CONCLUSION:**

Limited evidence suggests a 2-4 fold increased risk of stroke among women with migraine who use COCs compared with non-use. Additional study is needed on the risks of hormonal contraceptives, including combined and progestin-only methods, among women with different migraine subtypes.

**KEYWORDS:** combined oral contraceptives; migraine; stroke; systematic review  
PMID: 27153744

**Breast-feeding and Otitis media****Feeding at the breast and expressed milk feeding: associations with otitis media and diarrhea in infants**

The Journal of Pediatrics, 05/12/2016 Boone KM, et al.

The authors aimed to examine the associations of substance fed and mode of breast milk delivery with occurrence of otitis media and diarrhea in the first year of life. Substance fed and mode of breast milk delivery have different contributions to infant health depending on the health outcome of interest. Feeding at the breast may be advantageous compared with expressed milk feeding for reducing the risk of otitis media, and breast milk feeding compared with formula may reduce the risk of diarrhea.

**Methods**

- At 12 months postpartum, women (n = 813; 62% response) completed a questionnaire that assessed sociodemographics, infant occurrence of otitis media and diarrhea, and the timing of starting/stopping feeding at the breast, expressed milk, and formula.
- Women who intended to “bottle feed” exclusively were not recruited.
- Logistic and negative binomial regressions were conducted in the full sample (n = 491) and no–formula (n = 106) and bottle–only (n = 49) subsamples.

**Results**

- Longer duration of expressed milk feeding was associated with increased odds of experiencing otitis media (6–month OR [OR<sub>6–month</sub>] 2.15, 95% CI 1.01–4.55) in the no–formula subsample.
- Longer durations of breast milk feeding (OR<sub>6–month</sub> 0.70, 95% CI 0.54–0.92; 6–month incidence rate ratio [IRR<sub>6–month</sub>] 0.74, 95% CI 0.63–0.91), and feeding at the breast (OR<sub>6–month</sub> 0.70, 95% CI 0.54–0.89; IRR<sub>6–month</sub> 0.74, 95% CI 0.63–0.88) were associated with less diarrhea, and longer formula feeding duration was associated with increased risk of diarrhea (IRR<sub>6–month</sub> 1.34, 95% CI 1.13–1.54) in the full sample.

## 8. VISCERA

### Abuse and IBS

Neurogastroenterol Motil. 2016 May 5. doi: 10.1111/nmo.12848.

#### **The impact of abuse and mood on bowel symptoms and health-related quality of life in irritable bowel syndrome (IBS).**

Kanuri N<sup>1</sup>, Cassell B<sup>1</sup>, Bruce SE<sup>2</sup>, White KS<sup>2</sup>, Gott BM<sup>3</sup>, Gyawali CP<sup>1</sup>, Sayuk GS<sup>1,3,4</sup>.  
Author information

Abstract

#### **BACKGROUND:**

Irritable bowel syndrome (IBS) is a common abdominal pain disorder without an organic explanation. Abuse histories (physical, sexual, emotional) are prevalent in IBS. While abuse relates to mood disorders (depression and anxiety) also common in IBS, the influence of abuse on gastrointestinal (GI) symptoms and health-related quality of life (HRQOL) and its independence from psychological symptom comorbidity has not been studied.

#### **METHODS:**

Consecutive GI outpatients completed the ROME III Research Diagnostic Questionnaire and questionnaires on trauma (Life-Stress Questionnaire), mood (Beck Depression/Anxiety Inventories), somatic symptoms (PHQ-12), and HRQOL (SF-36). Current GI symptom severity and bother were assessed using 10-cm Visual Analog Scales.

#### **KEY RESULTS:**

272 ROME-defined IBS (47.6 ± 0.9 years, 81% female) and 246 non-FGID (51.6 ± 1.0 years, 65% female) subjects participated. IBS patients reported greater rates of physical, sexual, and emotional abuse ( $p < 0.006$  each), and higher depression, anxiety, and somatic symptoms ( $p < 0.001$ ). Greater bowel symptom bother ( $7.4 \pm 0.2$  vs  $6.7 \pm 0.2$ ,  $p = 0.040$ ), severity ( $7.7 \pm 0.2$  vs  $6.5 \pm 0.2$ ,  $p < 0.001$ ), recent symptomatic days ( $9.8 \pm 0.4$  vs  $8.5 \pm 0.3$ ,  $p = 0.02$ ), and poorer HRQOL ( $40.9 \pm 2.3$  vs  $55.5 \pm 1.7$ ,  $p < 0.001$ ) were noted in IBS with abuse. Abuse effects were additive, with greater IBS symptom severity and poorer HRQOL noted in cases with multiple forms of abuse. Mediation analyses suggested that abuse effects on GI symptoms and HRQOL were partially mediated by mood.

#### **CONCLUSIONS & INFERENCES:**

Abuse experiences common among IBS sufferers are associated with reports of greater GI symptoms and poorer HRQOL, particularly in those with multiple forms of abuse; this relationship may be partially mediated by concomitant mood disturbances.

**KEYWORDS:** abuse; depression; health-related quality of life; irritable bowel syndrome

### Nutrition deficits of GF diet

#### Gluten free diet and nutrient deficiencies: a review

Clinical Nutrition, 05/13/2016 Vici G, et al.

The aim of this study is to evaluate the nutritional quality of gluten free (GF)-diet. Despite the GF-diet is necessary in celiac disease treatment and the attention is on gluten avoidance, the evaluation of nutritional quality of the diet must be considered. Moreover, educational strategies based on the relationship between nutrients and food and human health could be developed to optimize the therapeutic approach in celiac patients.

#### Methods

- MEDLINE/PubMed and Cochrane Library were electronically searched for articles published between 1990/01/01 and 2015/09/01.

#### Results

- GF-diet was found to be poor in alimentary fiber due in particular to the necessary avoidance of several kinds of foods naturally rich in fiber (i.e. grain) and the low content of fiber of GF product that are usually made with starches and/or refined flours.
- Micronutrients are also found to be poor, in particular Vit. D, Vit. B12 and folate, in addition to some minerals such as iron, zinc, magnesium and calcium.
- Moreover, an inadequate macronutrient intake was reported related above all to the focus on the avoidance of gluten that often leaving back the importance of nutritional quality of the choice.
- In particular, it was found a higher content of both saturated and hydrogenated fatty acids and an increase in the glycemic index and glycemic load of the meal.

### IBS and peripheral joint inflammation

#### **Relationship between articular and nonarticular manifestations in inflammatory bowel diseases**

Journal of Research in Medical Sciences, 05/13/2016 Fatemi A, et al.

**T**his cross-sectional study aimed to draw a clinical picture of musculoskeletal manifestations (MSM) and their relationships with other findings in patients with inflammatory bowel diseases (IBDs). The most frequent extraintestinal manifestations in patients with IBD were MSM. Knee and ankle were the most frequent involved joints. Extraintestinal manifestations were determinant variables of arthritis.

**Vit D and IBS**

Neurogastroenterol Motil. 2016 May 7. doi: 10.1111/nmo.12851.

**Effect of vitamin D on gastrointestinal symptoms and health-related quality of life in irritable bowel syndrome patients: a randomized double-blind clinical trial.**

Abbasnezhad A<sup>1</sup>, Amani R<sup>2</sup>, Hajiani E<sup>3</sup>, Alavinejad P<sup>3</sup>, Cheraghian B<sup>4</sup>, Ghadiri A<sup>5</sup>.

**BACKGROUND:**

Low-grade mucosal inflammation and immune activation are involved in the pathogenesis of irritable bowel syndrome (IBS). Furthermore, IBS symptoms are associated with a significantly higher prevalence of psychological distress, which in itself results into an impaired quality of life (QoL). Vitamin D could ameliorate the symptoms of patients suffering from IBS through its beneficial effects on psychological factors and inflammation.

**METHODS:**

A total of 90 IBS patients participated in this double-blind, randomized, placebo-controlled study. Participants were randomly selected to receive either 50 000 IU vitamin D<sub>3</sub> or a placebo fortnightly for a period of 6 months. Patients reported their IBS symptoms at the baseline and monthly during intervention periods. The IBS severity score system (IBSSS) and IBS-specific QoL questionnaires were used at the baseline and postintervention.

**KEY RESULTS:**

Over the 6-month intervention period, a significantly greater improvement in IBS symptoms such as abdominal pain and distention, flatulence, rumbling, and overall gastrointestinal (GI) symptoms (except dissatisfaction with bowel habits) was observed in the patients receiving vitamin D as compared to the placebo group. The IBSSS and the IBS-QoL scores in the vitamin D group significantly improved compared to the placebo group postintervention (mean IBSSS score change:  $-53.82 \pm 23.3$  vs  $-16.85 \pm 25.01$ ,  $p < 0.001$ , respectively; mean IBS-QoL score change:  $14.26 \pm 3$  vs  $11 \pm 2.34$ ,  $p < 0.001$ , respectively).

**CONCLUSIONS & INFERENCES:**

Vitamin D seems to be an effective and safe option to improve QoL and symptoms of IBS. ClinicalTrials.gov ([NCT02579902](https://clinicaltrials.gov/ct2/show/study/NCT02579902)).

**KEYWORDS:** IBS severity score; gastrointestinal symptoms; health-related quality of life; irritable bowel syndrome; vitamin D

**Disorders in children**

J Pediatr. 2016 May 4. pii: S0022-3476(16)30056-7. doi: 10.1016/j.jpeds.2016.04.008.

**Prevalence of Functional Gastrointestinal Disorders in Children and Adolescents.**

Lewis ML<sup>1</sup>, Palsson OS<sup>1</sup>, Whitehead WE<sup>1</sup>, van Tilburg MA<sup>2</sup>.

**OBJECTIVES:**

To determine the prevalence of functional gastrointestinal (GI) disorders (FGIDs) in children and adolescents in a representative community sample of the US.

**STUDY DESIGN:**

The study recruited a general population sample of mothers (n = 949) of children and adolescents aged 4-18 years. Child and adolescent GI symptoms were assessed using parental report through online questionnaires, including the Questionnaire on Pediatric Gastrointestinal Symptoms and the PedsQL4.0 Generic Core Scale. Parental GI symptoms, and demographic characteristics were also assessed. The data was used to determine prevalence of FGIDs.

**RESULTS:**

Using Rome III criteria by parental report, 23.1% of children and adolescents qualified for at least 1 FGID. Functional constipation and abdominal migraine were the most common FGIDs. All 10 child/adolescent FGIDs occurred, except rumination. Significant prevalence differences were not found between sexes, except in functional constipation, which was more prevalent in males than females (P = .022). There were no significant prevalence differences between racial or ethnic groups. Children who met criteria for an FGID had lower quality of life (median = 76.4) than children who did not (median = 89.6; P < .001). Children were more likely to qualify for a FGID if their parent also qualified for a FGID (P < .01).

**CONCLUSIONS:**

FGIDs are common in children and adolescents in the US. There are no significant differences in FGIDs between sex, race, or ethnic groups, except in functional constipation. There is overlap between parental and child FGID symptoms. Children with a FGID report a lower quality of life than healthy children.

**KEYWORDS:** abdominal migraine; aerophagia; cyclic vomiting syndrome; functional abdominal pain; functional constipation; functional dyspepsia; functional gastrointestinal disorders; irritable bowel syndrome; nonretentive fecal incontinence; quality of life; rumination  
PMID: 27156185

## 9. THORACIC SPINE

### Mid back pain

Eur J Pain. 2016 May 5. doi: 10.1002/ejp.884.

#### **Incidence and prognosis of mid-back pain in the general population: A systematic review.**

Johansson MS<sup>1</sup>, Jensen Stochkendahl M<sup>2</sup>, Hartvigsen J<sup>1,2</sup>, Boyle E<sup>1,3</sup>, Cassidy JD<sup>1,3,4</sup>.  
Author information

Abstract

#### **BACKGROUND AND OBJECTIVE:**

Despite being common early in life and affecting individuals' quality of life to the same degree as neck and low back pain, research into epidemiological aspects of mid-back pain (MBP) has been scarce. The purpose of our systematic review was therefore to describe the incidence and prognosis of MBP in the general population. The PRISMA Statement guided the study process.

#### **DATABASES:**

A systematic search was conducted in CINAHL, PEDro, PsycINFO and Scopus.

#### **RESULTS:**

Of 3194 unique records identified, seven were included in our qualitative synthesis. The 3-month and 2-year incidence proportions of MBP in children and adolescents were approximately 4% and 50%, respectively. In adults, the 1-month incidence proportion was less than 1%. The persistence or recurrence of MBP over a 1- to 4-year period was between 13% and 45% in children and adolescents; a change in spinal pain location over time was common. Individuals reporting MBP have an increased risk of future care seeking compared with people without musculoskeletal complaints. No studies assessing adult MBP recovery trajectories or prognostic factors were identified.

#### **CONCLUSIONS:**

Knowledge about the incidence and prognosis of MBP in the general population is limited. The incidence of MBP in children and adolescents seems to be similar to the incidence of neck and low back pain; in adults, it is lower than that of neck and low back pain. Studies investigating recovery trajectories of MBP in adults and prognostic factors for MBP are lacking. **WHAT DOES THIS STUDY ADD?:** The incidence of mid-back pain (MBP) in young individuals is similar to that of neck and low back pain, and  $\leq 50\%$  report persistent pain; however, the evidence base is limited. Knowledge about adult trajectories and prognostic factors for MBP is lacking.

PMID: 27146481

### 13. CRANIUM/TMJ

#### Soft tissue changes after braces

Prog Orthod. 2016;17:13. doi: 10.1186/s40510-016-0125-1. Epub 2016 May 2.

#### **Factors influencing soft tissue profile changes following orthodontic treatment in patients with Class II Division 1 malocclusion.**

Maetevorakul S<sup>1</sup>, Viteporn S<sup>2</sup>.

#### **BACKGROUND:**

Several studies have shown soft tissue profile changes after orthodontic treatment in Class II Division 1 patients. However, a few studies have described factors influencing the soft tissue changes. The purpose of this study was to investigate the factors influencing the soft tissue profile changes following orthodontic treatment in Class II Division 1 patients.

#### **METHODS:**

The subjects comprised 104 Thai patients age 8-16 years who presented Class II Division 1 malocclusions and were treated with different orthodontic modalities comprising cervical headgear, Class II traction and extraction of the four first premolars. The profile changes were evaluated from the lateral cephalograms before and after treatment by means of the X-Y coordinate system. Significant soft tissue profile changes were evaluated by paired t test at a 0.05 significance level. The correlations among significant soft tissue changes and independent variables comprising treatment modality, age, sex, pretreatment skeletal, dental and soft tissue morphology were evaluated by stepwise multiple regression analysis at a 0.05 significance level.

#### **RESULTS:**

The multiple regression analysis indicated that different treatment modalities, age, sex, pretreatment skeletal, dental and soft tissue morphology were related to the profile changes. The predictive power of these variables on the soft tissue profile changes ranged from 9.9 to 40.3 %.

#### **CONCLUSIONS:**

Prediction of the soft tissue profile changes following treatment of Class II Division 1 malocclusion from initial patient morphology, age, sex and types of treatment was complicated and required several variables to explain their variations. Upper lip change in horizontal direction could be found only at the stomion superius and was less predictable than those of the lower lip. Variations in upper lip retraction at the stomion superius were explained by types of treatment ( $R(2) = 0.099$ ), whereas protrusion of the lower lip at the labrale inferius was correlated with initial inclination of the lower incisor (L1 to NB), jaw relation (ANB angle), lower lip thickness and sex ( $R(2) = 0.403$ ). Prediction of chin protrusion at the soft tissue pogonion was also low predictable ( $R(2) = 0.190$ ) depending upon sex, age and initial mandibular plane angle (SN-GoGn). Additionally, age and sex also had mainly effect on change of the soft tissue profile in the vertical direction.

**KEYWORDS:** Class II Division 1 malocclusion; Factors; Orthodontic treatment; Soft tissue profile changes *PMID: 27135067*

**TMJ dislocation**

Int J Oral Maxillofac Surg. 2016 May 6. pii: S0901-5027(16)30029-7. doi: 10.1016/j.ijom.2016.04.015.

**Comparison of different approaches to the reduction of anterior temporomandibular joint dislocation: a randomized clinical trial.**

Ardehali MM<sup>1</sup>, Tari N<sup>2</sup>, Bastaninejad S<sup>3</sup>, Amirizad E<sup>2</sup>.

This randomized clinical trial was designed to compare three different reduction methods for anterior temporomandibular joint (TMJ) dislocation.

The three methods evaluated were the conventional method, wrist pivot method, and extraoral method. The study sample comprised 90 consecutive patients suffering from anterior dislocation of the TMJ, who were allocated randomly to one of the three groups.

This study found success rates of 86.7% for the conventional method, 96.7% for the wrist pivot method, and 66.7% for the extraoral method. The extraoral method was more difficult for the physician and the patient than the other two methods. For the patients, the wrist pivot method was easier than the other methods. For the doctors, the extraoral method was significantly more difficult than the other methods. In conclusion, due to the absence of a biting risk with the extraoral method and the lack of a significant difference in success between this method and the conventional method, the extraoral method could be considered the appropriate first-line treatment where there is a risk of the patient biting the surgeon's hand.

Given the overall benefits of the wrist pivot method, this method could be considered the first-line and gold standard treatment modality in other cases.

**KEYWORDS:** temporomandibular joint; temporomandibular joint dislocation; temporomandibular joint reduction  
PMID: 27160610

**Sleep apnea and liver**

Clin Gastroenterol Hepatol. 2016 May 4. pii: S1542-3565(16)30150-1. doi: 10.1016/j.cgh.2016.04.037.

**Association Between Severity of Obstructive Sleep Apnea and Blood Markers of Liver Injury.**

Trzepizur W<sup>1</sup>, Boursier J<sup>2</sup>, Mansour Y<sup>3</sup>, Le Vaillant M<sup>4</sup>, Chollet S<sup>5</sup>, Pigeanne T<sup>6</sup>, Bizieux-Thaminy A<sup>7</sup>, Humeau MP<sup>8</sup>, Alizon C<sup>9</sup>, Goupil F<sup>10</sup>, Meslier N<sup>11</sup>, Priou P<sup>11</sup>, Calès P<sup>2</sup>, Gagnadoux F<sup>11</sup>; IRSR sleep cohort group.

**Abstract**

Obstructive sleep apnea (OSA) may contribute to the development of non-alcoholic fatty liver disease (NAFLD). We performed a multi-site cross-sectional study to evaluate the association between the severity of OSA and blood markers of liver steatosis (using the hepatic steatosis index), cytolysis (based on alanine aminotransferase activity), and significant liver fibrosis (based on FibroMeter NAFLD score) in 1285 patients with suspected OSA in France. After adjusting for confounders including central obesity, risk of liver steatosis increased with the severity of OSA (P for trend, <.0001) and sleep-related hypoxemia (P for trend, <.0003 for mean oxygen saturation). Decreasing mean oxygen saturation during sleep was also independently associated with a higher risk of liver cytolysis (P for trend, <.0048). Severe OSA conferred an approximate 2.5-fold increase in risk for significant liver fibrosis compared to patients without OSA, but the association between OSA severity and liver fibrosis was not maintained after adjusting for confounders.

**KEYWORDS:** clinic-based study; sleep disordered breathing; sleep related hypoxia

## Eye reprogramming

J Adv Nurs. 2016 May 1. doi: 10.1111/jan.12985.

**Investigating the effect of Eye Movement Desensitization and Reprocessing (EMDR) on postoperative pain intensity in adolescents undergoing surgery: a randomized controlled trial.**

Maroufi M<sup>1</sup>, Zamani S<sup>2</sup>, Izadikhah Z<sup>3</sup>, Marofi M<sup>4</sup>, O'Connor P<sup>5</sup>.

Author information

Abstract

**AIM:**

To investigate the efficacy of Eye Movement Desensitization and Reprocessing for postoperative pain management in adolescents.

**BACKGROUND:**

Eye Movement Desensitization and Reprocessing is an inexpensive, non-pharmacological intervention that has successfully been used to treat chronic pain. It holds promise in the treatment of acute, postsurgical pain based on its purported effects on the brain and nervous system.

**DESIGN:**

A randomized controlled trial was used.

**METHODS:**

Fifty-six adolescent surgical patients aged between 12-18 years were allocated to gender-balanced Eye Movement Desensitization and Reprocessing (treatment) or non-Eye Movement Desensitization and Reprocessing (control) groups. Pain was measured using the Wong-Baker FACES<sup>®</sup> Pain Rating Scale (WBFS) before and after the intervention (or non-intervention for the control group).

**FINDINGS:**

A Wilcoxon signed-rank test demonstrated that the Eye Movement Desensitization and Reprocessing group experienced a significant reduction in pain intensity after treatment intervention, whereas the control group did not. Additionally, a Mann-Whitney U-test showed that, while there was no significant difference between the two groups at time 1, there was a significant difference in pain intensity between the two groups at time 2, with the Eye Movement Desensitization and Reprocessing group experiencing lower levels of pain.

**CONCLUSION:**

These results suggest that Eye Movement Desensitization and Reprocessing may be an effective treatment modality for postoperative pain.

KEYWORDS: EMDR ; Eye Movement Desensitization and Reprocessing; adolescent health; experiment; nursing; pain; surgery

## 14. HEADACHES

## Vascular involvement in migraine

J Headache Pain. 2016 Dec;17(1):52. doi: 10.1186/s10194-016-0645-6. Epub 2016 May 11.

**Autonomous control of cardiovascular reactivity in patients with episodic and chronic forms of migraine.**

Mamontov OV<sup>1,2,3</sup>, Babayan L<sup>2,3</sup>, Amelin AV<sup>2,3</sup>, Giniatullin R<sup>4,5,3</sup>, Kamshilin AA<sup>6</sup>.

Author information

Abstract

**BACKGROUND:**

The autonomous cardiovascular control can contribute to progression of migraine. However, current data on cardiovascular reactivity in migraine, especially severe forms, are essentially contradictory. The main aim of this study was to compare the autonomous regulation of circulation in patients with episodic and chronic migraine and healthy subjects.

**METHODS:**

Seventy three migraine patients (mean age  $35 \pm 10$ ) including episodic migraine (51 patients, 4-14 headache days/months) and chronic migraine (22 patients,  $\geq 15$  headache days/month) along with age-match control (71 healthy voluntaries) were examined. The autonomic regulation of circulation was examined with the tilt-table test, a deep breathing and Valsalva Maneuver, handgrip test, cold-stress vasoconstriction, arterial baroreflex and blood pressure variability.

**RESULTS:**

The changes in heart rate induced by deep breathing, Valsalva Maneuver, and blood pressure in tilt-table test in patients with migraine did not differ from the control group. In contrast, the values of cold-stress-vasoconstriction forearm blood-flow reactivity ( $p < 0.001$ ), the increase in diastolic blood pressure in handgrip test ( $p < 0.001$ ), mean blood pressure in the late stage of the second phase of Valsalva Maneuver ( $p < 0.001$ ) and blood pressure variability ( $p < 0.005$ ) were all higher in patients with migraine than in the control group.

**CONCLUSION:**

Thus, both episodic and chronic migraine are associated with significant disturbances in autonomous control resulting in enhanced vascular reactivity whereas the cardiac regulation remains largely unchanged.

PMID: 27167136

## 16. CONCUSSIONS

### Rugby and concussions

Ir J Med Sci. 2016 May;185(2):521-8. doi: 10.1007/s11845-015-1313-6. Epub 2015 May 31.

#### Concussion in rugby: knowledge and attitudes of players.

O'Connell E<sup>1</sup>, Molloy MG<sup>2</sup>.

Abstract

##### **BACKGROUND:**

Concussion is a traumatic brain injury, resulting in the alteration of mental status with or without loss of consciousness. There is increasing awareness that recurrent concussion may contribute to long-term neurological complication.

##### **AIMS:**

To determine player knowledge and attitudes regarding concussion. To identify sources of information and medical care, and to estimate the incidence of concussion in this group. To determine if player gender and grade of competition are associated with differences in knowledge, attitudes, medical care, and incidence.

##### **METHODS:**

Five rugby teams were recruited and players invited to complete a paper-based questionnaire. The questionnaire sought information on player demographics, knowledge level, attitudes and concussion experience.

##### **RESULTS:**

90.8 % of players knew they should not continue playing when concussed. 75 % of players would continue an important game even if concussed. Of those concussed, 39.1 % have tried to influence medical assessment with 78.2 % stating it is possible or quite easy to do so. Males are less likely to worry about long-term effects of concussion ( $\chi^2(2) = 9.23, p = 0.026$ ). Club players are less likely to have medical care at training ( $\chi^2(2) = 28.2, p < 0.001$ ) or matches ( $\chi^2(2) = 19.47, p < 0.001$ ).

##### **CONCLUSION:**

Despite good knowledge of concussion complications, management players engage in unsafe behaviour with little difference between gender and competition grades. Information regarding symptoms and management should be available to all players, coaches, and parents. Provision of medical care should be mandatory at every level of competition.

**KEYWORDS:** Attitude; Brain; Concussion; Knowledge; Sports  
PMID: 26026952

**25. WRIST AND HAND****Hand strength and morbidity**

Eur J Intern Med. 2016 Apr 20. pii: S0953-6205(16)30053-X. doi: 10.1016/j.ejim.2016.04.001.

**Handgrip strength is inversely and independently associated with multimorbidity among older women: Results from the KORA-Age study.**

Volaklis KA<sup>1</sup>, Halle M<sup>2</sup>, Thorand B<sup>3</sup>, Peters A<sup>3</sup>, Ladwig KH<sup>3</sup>, Schulz H<sup>4</sup>, Koenig W<sup>5</sup>, Meisinger C<sup>3</sup>.

Author information

Abstract

**BACKGROUND:**

Data on the association between handgrip strength and multimorbidity (MMB) are missing.

**AIM:**

The purpose of this study was to examine if handgrip strength is related to MMB in a large population-based sample of older persons.

**METHODS:**

The cross-sectional analysis was based on 1079 older people (aged 65-94years), who participated in the KORA-Age study in the Augsburg region, southern Germany. Participants underwent an interview and extensive examinations, including anthropometric measurements, registration of chronic diseases, determination of health-related behaviors (smoking, alcohol intake and physical activity), collection of blood samples, and muscle strength measurement using hand-grip dynamometry.

**RESULTS:**

In men, handgrip strength correlated strongly with the number of co-existing diseases ( $r=-0.176$ ,  $p<0.001$ ), and the same pattern was observed for women ( $r=-0.287$ ,  $p<0.001$ ). Among women, handgrip strength in the lower tertile compared to the upper tertile was significantly associated with an increased odds of having MMB (OR: 2.57, 95% CI: 1.30-5.07,  $p=0.007$ ) after controlling for age, BMI, education, alcohol intake, smoking habits, medications number, inflammatory markers, telomere length and levels of physical activity. Contrary, no significant association between handgrip strength and MMB was found among men (OR: 1.32, 95% CI: 0.73-2.40,  $p=0.362$ ) after multivariable adjustment.

**CONCLUSION:**

Lower levels of handgrip strength are associated with a higher odd of MMB among older women even after adjusting for traditional and novel confounders. Increasing the levels of muscular strength in older women seems to be important in order to reduce the risk for the co-occurrence of multiple chronic diseases.

**KEYWORDS:** Chronic diseases; Handgrip strength; Multimorbidity; Older persons

## 26. CARPAL TUNNEL SYNDROME

### Surgery helps

BMC Musculoskelet Disord. 2016 Apr 27;17(1):190. doi: 10.1186/s12891-016-1046-3.

#### **Predictors of the patient-centered outcomes of surgical carpal tunnel release - a prospective cohort study.**

Conzen C<sup>1</sup>, Conzen M<sup>1</sup>, RübSamen N<sup>2</sup>, Mikolajczyk R<sup>3,4</sup>.

Author information

Abstract

#### **BACKGROUND:**

Carpal tunnel syndrome (CTS) causes a substantial burden of disease in society. While CTS can be resolved by surgical carpal tunnel release, it still remains unclear as to what degree outcomes depend on patients' characteristics. This study assesses patient-centered outcomes after surgical carpal tunnel release in a large outpatient clinic in Germany.

#### **METHODS:**

Patients with CTS were recruited prospectively between August 1(st) and December 31(st), 2013. We assessed socio-demographic and psychological factors as well as nerve conduction velocities at baseline (before the surgery) and at three and six months after surgery. We analyzed the improvement of patient-centered outcomes (symptoms and function of the affected hand as well as measures of well-being and subjective quality of life) at the two follow-up time points and investigated if socio-demographic characteristics and CTS-related variables predict the success of the surgery with respect to nerve conduction velocities and patient-centered outcomes by means of analysis of covariance (ANCOVA). Factors influencing the duration of sick leave were investigated by means of Cox regression.

#### **RESULTS:**

The study sample consisted of 71 CTS cases. Surgical carpal tunnel release generally improved nerve conduction velocity and patient-centered outcomes. Regarding the former, the improvement was proportional to the severity score at baseline. The presence of muscular atrophy in the thenar area at baseline displayed medium size effects for the patient-centered outcomes. Other socio-demographic characteristics and CTS-related variables did not have a strong predictive effect on the improvement of nerve conduction velocity and patient-centered outcomes.

#### **CONCLUSIONS:**

There is a significant improvement of clinical and subjective outcomes after CTS surgery in the outpatient sector. The improvement is largely independent of socio-demographic and clinical characteristics of the patients.

**KEYWORDS:** Carpal tunnel syndrome; Nerve conduction velocity; Patient-centered outcomes

**29. OA****Increased risk of falls**

Int J Rheum Dis. 2016 May 6. doi: 10.1111/1756-185X.12871.

**Is there an increased risk of falls and fractures in people with early diagnosed hip and knee osteoarthritis? Data from the Osteoarthritis Initiative.**

Smith TO<sup>1</sup>, Higson E<sup>2</sup>, Pearson M<sup>3</sup>, Mansfield M<sup>4</sup>.

**AIMS:**

To assess the probability of individuals with early-diagnosed hip or knee osteoarthritis experiencing a fall and/or fracture compared to a cohort without osteoarthritis.

**METHODS:**

Data were analyzed from the Osteoarthritis Initiative dataset. We identified all people who were diagnosed with hip or knee osteoarthritis within a 12 month period, compared to those without osteoarthritis. We determined whether there was a difference in the occurrence of falls, with or without consequential fractures, between people newly diagnosed with hip or knee osteoarthritis compared to those who had not, using odd ratios (OR) and 95% confidence intervals (95% CI).

**RESULTS:**

Five hundred and fifty-two individuals with hip osteoarthritis were compared to 4244 individuals without hip osteoarthritis; 1350 individuals with knee osteoarthritis were compared to 3445 individuals without knee osteoarthritis. People with knee osteoarthritis had a 54% greater chance of experiencing a fall compared to those without (OR: 1.54; 95% CI: 1.35-1.77). People with hip osteoarthritis had a 52% greater chance of experiencing a fall compared to those without hip osteoarthritis (OR: 1.52; 95% CI: 1.26-1.84). People with knee and hip osteoarthritis demonstrated over an 80% greater chance of experiencing a fracture in the first 12 months of their diagnosis compared to those without hip or knee osteoarthritis (total knee arthroplasty: OR 1.81; total hip arthroplasty: OR 1.84).

**CONCLUSIONS:**

There is an increased risk of falls and fractures in early-diagnosed knee and hip osteoarthritis compared to those without osteoarthritis. International guidelines on the management of hip and knee osteoarthritis should consider the management of falls risk.

**KEYWORDS:** arthritis; falls; injury; joint degenerative; lower limb; older people  
PMID: 27153388

### Abd muscle volume

#### **Hip abductor muscle volume in hip osteoarthritis and matched controls**

Osteoarthritis and Cartilage , 05/09/2016 Zacharias A, et al.

**T**his study aimed to quantify differences in hip abductor muscle volume, fatty infiltration and strength in a unilateral hip osteoarthritis (OA) population when compared to a control group. Impact of radiographic severity of OA on these variables was also examined. Gluteal muscle atrophy, increased gluteal fatty infiltration and hip strength deficits were evident in the affected hips of OA participants. Since severity of OA was related to the extent of atrophy and fatty deposits, rehabilitation programs targeting these muscles could reverse or halt the progression of these structural and functional deficits.

**32 A. KNEE/ACL****OA changes**

Am J Sports Med. 2016 May;44(5):1215-1224. Epub 2016 Feb 24.

**Changes in Knee Osteoarthritis, Symptoms, and Function After Anterior Cruciate Ligament Reconstruction: A 20-Year Prospective Follow-up Study.**

Risberg MA<sup>1</sup>, Oiestad BE<sup>2</sup>, Gunderson R<sup>3</sup>, Aune AK<sup>4</sup>, Engebretsen L<sup>5</sup>, Culvenor A<sup>6</sup>, Holm I<sup>7</sup>.

**BACKGROUND:**

Progression of tibiofemoral (TF) and patellofemoral (PF) osteoarthritis (OA) and changes in knee function more than 15 years after anterior cruciate ligament reconstruction (ACLR) are not well understood.

**PURPOSE:**

To examine the progression of knee OA and changes in symptoms and function in isolated and combined injuries from 15 to 20 years after ACLR.

**STUDY DESIGN:**

Cohort study; Level of evidence, 2.

**METHODS:**

A total of 210 subjects with ACLR were prospectively followed. At the 15- and 20-year follow-ups, radiographs were obtained and classified by the Kellgren and Lawrence (K-L) grading system. Symptoms and function were evaluated with the Knee injury and Osteoarthritis Outcome Score (KOOS) as well as isokinetic quadriceps and hamstring muscle strength tests.

**RESULTS:**

There were 168 subjects (80%) who returned for the 20-year follow-up, with a mean ( $\pm$ SD) age of  $45 \pm 9$  years, mean body mass index of  $27 \pm 4$ , and median Tegner activity level of 4 (range, 0-9). The prevalence of radiographic TF and PF OA at the 20-year follow-up was 42% and 21%, respectively. Patients with ACL injuries and other combined injuries had significantly higher prevalence of radiographic TF OA compared with those who had isolated ACL injury ( $P < .0001$ ). There was a 13% increase in radiographic TF OA ( $P = .001$ ) and an 8% increase in PF OA ( $P = .015$ ) from the 15- to the 20-year follow-up. A significant deterioration in knee symptoms and function was observed on the KOOS subscales ( $P \leq .01$ ), with the exception of quality of life ( $P = .14$ ), as well as a decrease in quadriceps muscle strength and hamstring muscle strength ( $P < .0001$ ).

**CONCLUSION:**

The prevalence of radiographic TF and PF OA was 42% and 21%, respectively. A significantly higher prevalence of TF OA was found for subjects with combined injuries compared with those who had isolated ACL injury. The majority of the subjects were stable radiographically over the 5 years between follow-ups. A statistically significant deterioration in symptoms and function was noted, but the mean changes were of questionable clinical importance.

**KEYWORDS:** ACL reconstruction; knee function; osteoarthritis  
PMID: 26912282

**Ligamentous support**

Am J Sports Med. 2016 May;44(5):1203-8. doi: 10.1177/0363546515623510. Epub 2016 Jan 25.

**Distribution of Force in the Medial Collateral Ligament Complex During Simulated Clinical Tests of Knee Stability.**

Schafer KA<sup>1</sup>, Tucker S<sup>2</sup>, Griffith T<sup>3</sup>, Sheikh S<sup>2</sup>, Wickiewicz TL<sup>3</sup>, Nawabi DH<sup>3</sup>, Imhauser CW<sup>2</sup>, Pearle AD<sup>3</sup>.

**BACKGROUND:**

Pivot-shift injury commonly results in combined anterior cruciate ligament (ACL)/medial collateral ligament (MCL) injury, yet the contribution of the components of the MCL complex to restraining multiplanar rotatory loads forming critical subcomponents of the pivot shift is not well understood.

**PURPOSE:**

To quantify the role of the MCL complex in restraining multiplanar rotatory loads.

**STUDY DESIGN:**

Controlled laboratory study.

**METHODS:**

A robotic manipulator was used to apply combined valgus and internal rotation torques in a simplified model of the pivot-shift examination in 12 cadaveric knees ( $49 \pm 11$  years). Tibiofemoral kinematics were recorded with the ACL intact. Loads borne by the superficial MCL (sMCL), posterior oblique ligament (POL), deep MCL (dMCL), and ACL were determined via the principle of superposition.

**RESULTS:**

The POL bore about 50% of the load carried by the ACL in response to the combined torques at 5° and 15° of flexion. The POL bore load during the internal rotation component of the combined torques, while the sMCL carried load during the valgus and internal rotation phases of the simulated pivot. Load in the dMCL was always <10% of the ACL in response to combined valgus and internal rotation torques.

**CONCLUSION:**

The POL provides complementary load bearing to the ACL near extension in response to combined torques, which capture key components of the pivot-shift examination. The sMCL resists the valgus component of the maneuver alone, a loading pattern unique from those of the POL and ACL. The dMCL is not loaded during clinical tests of rotational knee stability in the ACL-competent knee.

**CLINICAL RELEVANCE:**

Both the sMCL and POL work together with the ACL to resist combined moments, which form key components of the pivot-shift examination.

**KEYWORDS:** *anterior cruciate ligament; deep medial collateral ligament; load; pivot shift; posterior oblique ligament; robot; superficial medial collateral ligament; superposition*

**Post ACL meniscal involvement**

Knee Surg Sports Traumatol Arthrosc. 2016 May 3.

**Articular cartilage status 2 years after arthroscopic ACL reconstruction in patients with or without concomitant meniscal surgery: evaluation with 3.0T MR imaging.**

Michalitsis S<sup>1</sup>, Hantes M<sup>1</sup>, Thriskos P<sup>2</sup>, Tsezou A<sup>3</sup>, Malizos KN<sup>1</sup>, Fezoulidis I<sup>2</sup>, Vlychou M<sup>4</sup>.

**PURPOSE:**

To assess articular cartilage changes in the knee joint as detected on 3.0T MR imaging after 2-year follow-up in patients who underwent arthroscopic anterior cruciate ligament reconstruction (ACLR) with or without concomitant meniscal surgery.

**METHODS:**

A total of twenty-nine patients (mean age  $30.3 \pm 10$  years), who underwent arthroscopic ACLR, received clinical and imaging follow-up at an average of  $27.8 \pm 4.8$  months after surgery. Our patients were divided into two subgroups: eighteen patients with additional meniscal injuries at the time of arthroscopic ACLR who underwent meniscal surgery and eleven patients with intact menisci. The cartilage status of all knees at the time of arthroscopic ACLR was recorded. All patients underwent an MRI scan preoperatively and at follow-up with the same imaging protocol. Cartilage status of all knee compartments was evaluated at the time of follow-up by MR imaging and the ICRS classification.

**RESULTS:**

Deterioration of the cartilage status was found at all knee compartments of our study group, with respect to the number of cartilage defects. The cartilage of the lateral femoral condyle (LFC) was most severely affected, followed by patellar and medial femoral condyle (MFC) cartilage. A statistically significant relation was found between surgery of the medial meniscus and the development of new cartilage defects in LFC ( $p = 0.01$ ) and MFC ( $p = 0.03$ ) after adjusting for the site of meniscal surgery. The cartilage of LFC and the status of the medial meniscus were also found to be significantly related ( $p = 0.04$ ). Partial meniscectomy was found to be associated with an increased incidence of new cartilage defects when compared to either meniscal repair or absence of meniscal surgery, although it was not statistically significant.

**CONCLUSION:**

Development of new cartilage lesions was evident after 2-year follow-up in patients with arthroscopic ACLR as detected by MR imaging. There was a multicompartamental pattern of cartilage involvement, and the lateral compartment was most severely affected. Partial meniscectomy at the time of arthroscopic ACLR could be suggested as an additional risk factor for the progression of chondral lesions.

**LEVEL OF EVIDENCE:**

Prospective comparative study, Level II.

**KEYWORDS:** 3.0T MRI; Anterior cruciate ligament reconstruction; Cartilage

PMID:27141867

**ACL loading post**

Knee. 2016 Apr 26. pii: S0968-0160(16)30004-7. doi: 10.1016/j.knee.2016.03.007.

**Anterior cruciate ligament (ACL) loading in a collegiate athlete during sidestep cutting after ACL reconstruction: A case study.**

Samaan MA<sup>1</sup>, Ringleb SI<sup>2</sup>, Bawab SY<sup>2</sup>, Greska EK<sup>3</sup>, Weinhandl JT<sup>4</sup>.

**BACKGROUND:**

Athletes with anterior cruciate ligament (ACL) injuries usually undergo ACL-reconstruction (ACLR) in order to restore joint stability, so that dynamic maneuvers such as the sidestep cut can be performed. Despite restoration of joint stability after ACLR, many athletes do not return to pre-injury levels and may be at a high risk of a second ACL injury. The purpose of this study was to determine whether or not ACL loading, would increase after ACLR.

**METHODS:**

One female Division I collegiate athlete performed bilateral unanticipated sidestep cuts both before ACL injury and 27months after ACLR. Musculoskeletal simulations were used to calculate ACL loading during the deceleration phase of the sidestep cuts.

**RESULTS:**

Twenty-seven months after ACLR, the athlete demonstrated higher total ACL loading in the ipsilateral limb as well as altered joint kinematics, moments, and quadriceps muscle force production. In the contralateral limb, there were no increases in total ACL loading or muscle force production yet altered lower extremity joint kinematics and moments were present after ACLR.

**CONCLUSIONS:**

Higher total ACL loading in the ipsilateral limb of this athlete may suggest an increased risk of second ACL injury. The results of this study provide an initial step in understanding the effects of ACLR on the risk of second ACL injury in an elite athlete and suggest that it is important to develop a better understanding of this surgical intervention on knee joint loading, in order to reduce the risk of second ACL injury while performing dynamic maneuvers.

**KEYWORDS:** ACL loading; ACL reconstruction; Anterior cruciate ligament; Musculoskeletal modeling; OpenSim; Sidestep cutting

### 33. MENISCUS

#### Results of operation

Am J Sports Med. 2016 May;44(5):1237-42. doi: 10.1177/0363546515626184. Epub 2016 Feb 17.

#### **Survivorship of Meniscal Allograft Transplantation in an Athletic Patient Population.**

Waterman BR<sup>1</sup>, Rensing N<sup>1</sup>, Cameron KL<sup>2</sup>, Owens BD<sup>3</sup>, Pallis M<sup>1</sup>.

#### **BACKGROUND:**

There are limited data evaluating the clinical outcomes of meniscal allograft transplantation (MAT) in physically active cohorts.

#### **PURPOSE:**

To determine the survivorship, complication rates, and functional outcomes of MAT in an active military population.

#### **STUDY DESIGN:**

Case series; Level of evidence, 4.

#### **METHODS:**

All military patients undergoing MAT between 2007 and 2013 were identified from the Military Health System. Previous/concomitant procedures, perioperative complications, reoperation rate, revision, and initiation of medical discharge for persistent knee disability were recorded. Univariate analysis was performed to identify associations between patient-based and surgical variables on selected endpoints.

#### **RESULTS:**

A total of 230 MATs (227 patients; 228 knees) were identified; the mean patient age was 27.2 years (range, 18-46 years), and the cohort was predominately male (89%). Approximately half (51%) of the patients had undergone prior, nonmeniscal knee procedures. Medial MATs were performed in 160 (69%) cases, and isolated MATs were most common (60%). A total of 51 complications occurred in 46 (21.1%) patients, including a secondary tear or extrusion (9%). At a mean clinical follow-up of 2.14 years, 10 (4.4%) patients required secondary meniscal debridement, while 1 (0.4%) patient required revision MAT and 2 (0.9%) patients underwent total knee arthroplasty. After MAT, 50 (22%) patients underwent knee-related military discharge at a mean of 2.49 years postoperatively. Tobacco use ( $P = .028$ ) was associated with significantly increased risk of failure, and operation by fellowship-trained surgeons trended toward significance as a protective factor ( $P = .078$ ). Furthermore, high-volume surgeons ( $\geq 1$  MAT/year; range, 9-35) had significantly reduced rates of failure ( $P = .046$ ).

#### **CONCLUSION:**

While reporting low reoperation and revision rates, this investigation indicates that 22% of patients with MAT were unable to return to military duty due to persistent knee limitations at short-term follow-up. Increased surgical experience may decrease rates of failure after MAT. Careful patient selection and referral to subspecialty-trained, higher-volume surgeons should be considered to optimize clinical outcomes after MAT.

**34. PATELLA****Adolescent knee pain**

Am J Sports Med. 2016 May;44(5):1165-71. doi: 10.1177/0363546515622456. Epub 2016 Jan 20.

**Is Knee Pain During Adolescence a Self-limiting Condition? Prognosis of Patellofemoral Pain and Other Types of Knee Pain.**

Rathleff MS<sup>1</sup>, Rathleff CR<sup>2</sup>, Olesen JL<sup>3</sup>, Rasmussen S<sup>4</sup>, Roos EM<sup>5</sup>.

**BACKGROUND:**

The prevalence of adolescent knee pain is 33%, and patellofemoral pain (PFP) is the most common diagnosis with a nontraumatic onset. The 2-year prognosis of adolescent PFP compared with other types of knee pain is unknown.

**PURPOSE:**

To investigate the 2-year prognosis of knee pain among adolescents with and without a diagnosis of PFP.

**STUDY DESIGN:**

Cohort study; Level of evidence, 2.

**METHODS:**

In 2011, a cohort of 2200 adolescents aged 15 to 19 years answered an online questionnaire on musculoskeletal pain. Of these, 504 reported knee pain, and 153 of these were clinically diagnosed with PFP. After 2 years, the 504 adolescents, as well as 252 randomly selected adolescents who did not report knee pain in 2011, were contacted again. Primary outcome at follow-up was the proportion of adolescents with knee pain during the last week prior to follow-up.

**RESULTS:**

Overall, 55.9% (95% CI, 50.8%-60.9%) of those reporting knee pain at baseline also reported pain 2 years later. Adolescents diagnosed with PFP had a 1.26 (95% CI, 1.05-1.50) higher relative risk (RR) of knee pain at follow-up compared with other types of knee pain. Adolescents with PFP were significantly more likely to reduce or stop sports participation compared with adolescents with other types of knee pain. Of those without knee pain at baseline, 12.8% (95% CI, 8.4%-17.2%) reported knee pain at follow-up in 2013. Adolescents with knee pain at baseline had a 4.51 (95% CI, 3.15-6.45) higher RR of knee pain at follow-up compared with adolescents without knee pain at baseline.

**CONCLUSION:**

Knee pain during adolescence, and PFP in particular, is in most cases present after 2 years and thus may not be self-limiting. A greater focus on early detection and prevention of knee pain during adolescence is needed.

**KEYWORDS:** adolescents; motor activity; pain; prognosis; sports participation  
PMID: 26792702

**35. KNEE/TOTAL****Kinematic alignment**

Knee Surg Sports Traumatol Arthrosc. 2016 Apr 27.

**PSI kinematic versus non-PSI mechanical alignment in total knee arthroplasty: a prospective, randomized study.**

Calliess T<sup>1</sup>, Bauer K<sup>1</sup>, Stukenborg-Colsman C<sup>1</sup>, Windhagen H<sup>1</sup>, Budde S<sup>1</sup>, Ettinger M<sup>2</sup>.

**PURPOSE:**

Kinematic alignment in TKA is supposed to restore function by aligning the components to the pre-morbid flexion-extension axis instead of altering the joint line and natural kinematic axes of the knee. The purpose of this study was to compare mechanically aligned TKA to kinematic alignment.

**METHODS:**

In this study, 200 patients underwent TKA and were randomly assigned to 2 groups: 100 TKAs were performed using kinematic alignment with custom-made cutting guides in order to complete cruciate-retaining TKA; the other 100 patients underwent TKA that was manually performed using mechanical alignment. The WOMAC and combined Knee Society Score (KSS), as well as radiological alignment, were determined as outcome parameters at the 12-month endpoint.

**RESULTS:**

WOMAC and KSS significantly improved in both groups. There was a significant difference in both scores between groups in favour of kinematic alignment. Although the kinematic alignment group demonstrated significantly better overall results, more outliers with poor outcomes were also seen in this group. A correlation between post-operative alignment deviation from the initial plan and poor outcomes was also noted. The most important finding of this study is that applying kinematic alignment in TKA achieves comparable results to mechanical alignment in TKA. This study also shows that restoring the pre-morbid flexion-extension axis of the knee joint leads to better overall functional results.

**CONCLUSION:**

Kinematic alignment is a favourable technique for TKA.

**CLINICAL RELEVANCE:**

The kinematic alignment idea might be a considerable alternative to mechanical alignment in the future.

**LEVEL OF EVIDENCE:**

II.

**KEYWORDS:** Kinematic alignment; PSI; Shape match; TKA; TKR; Total knee arthroplasty; Total knee replacement

### 37. OSTEOARTHRITIS/KNEE

#### Physical activities impact on pain

#### **The association between daily physical activity and pain among patients with knee osteoarthritis: the moderating role of pain catastrophizing**

The Journal of Pain, 05/12/2016 Franceschelli O, et al.

**D**espite the potential benefits of physical activity for patients with chronic musculoskeletal pain, it is well known that physical activity may lead to transient increases in patients' levels of pain. To date, however, little research has been conducted on the psychological factors that might moderate (i.e., amplify or attenuate) the impact of physical activity on pain. For instance, it is possible that physical activity leads to heightened levels of pain, but only among specific subgroups of patients, such as those with high levels of catastrophizing or negative affect.

**Cost effectiveness of HA**

Adv Ther. 2016 May 4.

**Cost-Effectiveness of Different Forms of Intra-Articular Injections for the Treatment of Osteoarthritis of the Knee.**

Rosen J<sup>1,2</sup>, Sancheti P<sup>3</sup>, Fierlinger A<sup>4</sup>, Niazi F<sup>4</sup>, Johal H<sup>5</sup>, Bedi A<sup>6</sup>.

**INTRODUCTION:**

Osteoarthritis (OA), as one of the leading causes of disability, decreases the quality of life for those suffering from the disease and creates a substantial financial burden. Intra-articular hyaluronic acid (HA) can provide relief from the symptoms of OA and multiple HA products are prescribed. The purpose of this study is to examine the single payer cost-effectiveness of various HA products in the treatment of knee OA.

**METHODS:**

A single payer economic evaluation was conducted comparing Synvisc<sup>®</sup> (Sanofi, USA), Durolane<sup>®</sup> (Bioventus, USA), Hyalgan<sup>®</sup> (Fidia Pharma Inc., USA), Supartz<sup>™</sup> (Bioventus, USA), and Euflexxa<sup>®</sup> (Ferring Pharmaceuticals Inc., USA). Utility scores for HA products were obtained by extracting Western Ontario and McMaster Universities Arthritis Index pain, stiffness and function from randomized controlled trials and converting them to health utilities index mark 3 scores. The cost of a treatment included the cost of the HA injection, cost of a knee injection procedure and cost of a doctor's visit for each required injection. Cost-utility in 2015 USD per quality-adjusted life years (QALY) saved was calculated for each HA product, and incremental cost-effectiveness ratios were calculated to compare the effectiveness of HA products to one another and to conventional care.

**RESULTS:**

When compared to conventional care, all investigated HA products were cost-effective, assuming a willingness-to-pay threshold of \$50,000/QALY gained. The HA product Euflexxa had the most favorable cost-utility ratio (\$5785.52/QALY) when compared to all other HA brands.

**CONCLUSION:**

The present study showed several HA products to be cost-effective in comparison to conventional care, with Euflexxa having the most favorable cost/QALY gained ratio compared to the other HA products.

**FUNDING:**

Ferring Pharmaceuticals Inc.

**KEYWORDS:** Cost-effectiveness; Euflexxa; Hyaluronic acid; Knee; Osteoarthritis  
PMID: 27146676

**Associated pain with OA****Associations Between Mri-Defined Structural Pathology And Generalized And Localized Knee Pain – The Oulu Knee Osteoarthritis Study**

Päivi Kaukinen, M.D. Jana Podlipská Ali Guermazi Jaakko Niinimäki Petri Lehenkari Frank W. Roemer Miika T. Nieminen Juhani M. Koski Jari PA. Arokoski Simo Saarakkala

**Summary****Objective**

To determine the associations between multi-feature structural pathology assessed using magnetic resonance imaging (MRI) and the presence of knee pain, and to determine the associations between the locations of structural changes and different knee pain patterns.

**Method**

Eighty symptomatic subjects with knee pain and suspicion or diagnosis of knee OA and 63 asymptomatic subjects underwent knee MRI. Severity of structural changes was graded by MRI Osteoarthritis Knee Score (MOAKS) in separate knee locations. The associations between cartilage damage, bone marrow lesions, osteophytes, Hoffa's synovitis, effusion-synovitis, meniscal damage and structural pathologies in ligaments, tendons and bursas and both the presence of pain and the knee pain patterns were assessed.

**Results**

The presence of Hoffa's synovitis (adjusted RR 1.6, 95% CI 1.2 to 1.3) and osteophytes in any region (2.07, 1.19 to 3.60) was significantly associated with the presence of pain. Any Hoffa's synovitis was associated with patellar pain (adjusted RR 4.70, 95% CI 1.19 to 3.60) and moderate-to-severe Hoffa's synovitis with diffuse pain (2.25, 1.13 to 4.50). Medial knee pain was associated with cartilage loss in the medial tibia (adjusted RR 2.66, 95% CI 1.22 to 5.80), osteophytes in the medial tibia (2.66, 1.17 to 6.07) and medial femur (2.55, 1.07 to 6.09), medial meniscal maceration (2.20, 1.01 to 4.79) and anterior meniscal extrusions (2.78, 1.14 to 6.75).

**Conclusions**

Hoffa's synovitis and osteophytes were strongly associated with the presence of knee pain. Medial pain was associated most often with medially located structural pathologies.

*Keywords:*

Knee Osteoarthritis, Magnetic Resonance Imaging, Pain

**Gait speed and depression**

Arthritis Care Res (Hoboken). 2016 May 9. doi: 10.1002/acr.22928.

**The association of slow gait speed with trajectories of worsening depressive symptoms in knee osteoarthritis: An observational study.**

White DK<sup>1</sup>, Neogi T<sup>2</sup>, Zhang Y<sup>2</sup>, Niu J<sup>2</sup>, Katz PP<sup>3</sup>.

**BACKGROUND:**

The purpose of this study was to investigate the association of slow gait speed, defined as walking slower than what is necessary for the community with trajectories of depressive symptoms over 7 years among people with or at high risk of knee OA.

**METHODS:**

Using data from the Osteoarthritis Initiative, we described trajectories of depressive symptoms measured annually with the Center for Epidemiologic Studies Depression Scale (CES-D). We categorized speed during a 20-meter walk < 1.2 m/s as 'slow gait speed'. We used a group-based method (PROC TRAJ) to agnostically identify homogeneous clusters of depressive symptom trajectories. We then examined the association of slow gait speed with depressive symptom trajectories using multinomial logistic regression adjusted for potential confounders.

**RESULTS:**

From the 3939 participants included (age  $61.4 \pm 9.2$ , BMI  $28.4 \pm 4.7$ , 58% women, 63% college degree), we identified five trajectories. The first three were stable over time and included 74% of the sample. The remainder had worsening depressive symptoms over time. Slow gait speed was associated with 2.0 times the odds of having the worst depressive symptoms trajectory compared those without slow gait speed.

**CONCLUSION:**

Slow gait speed may represent important risk factor for worsening depressive symptoms over time in people with or at high risk of knee OA, and may signal the need for rehabilitation. This article is protected by copyright. All rights reserved.

PMID:27158972

**38 A. FOOT AND ANKLE****Navicular syndrome**

Foot Ankle Int. 2016 Apr 18. pii: 1071100716644791.

**Accessory Navicular Syndrome in Athlete vs General Population.**

Jegal H<sup>1</sup>, Park YU<sup>2</sup>, Kim JS<sup>3</sup>, Choo HS<sup>4</sup>, Seo YU<sup>4</sup>, Lee KT<sup>1</sup>.

**BACKGROUND:**

Symptomatic accessory navicular syndrome (ANS) typically develops in young athletes. The symptoms are exacerbated during exercise or while walking, affecting the sports performance of athletes. The purpose of this study was to evaluate the radiologic findings and clinical course in athletes with accessory navicular syndrome (ANS) in comparison with a nonathletic population.

**METHODS:**

Seventy-nine patients with ANS between August 2012 and August 2013 were included. Overall, 29 were athletes and 50 were not athletes, and 19 (2 athletes and 17 nonathletes) of them improved after at least 6 months of conservative treatment. The records of 60 patients (64 consecutive feet) of ANS treated by modified Kidner operation were evaluated retrospectively. The study population included 27 athletes (31 feet) and 33 nonathletes (33 feet). Clinical features and radiologic findings were compared between them.

**RESULTS:**

Overall, 34% of the nonathletes improved after conservative treatment, but only 6.9% of athletes improved ( $P < .001$ ). Mean age at surgery in the athlete group was 16.1 years (range, 12-26), and 24.3 years (range, 12-52) in the nonathlete group ( $P < .001$ ). There was a history of trauma in 23 feet (74%) of the athlete group and in 13 feet (39%) of the nonathlete group ( $P = .006$ ). Eighteen feet (58%) in the athlete group and 11 feet (32%) in the nonathlete group showed movement between the 2 bones ( $P = .047$ ). Bone marrow edema was observed in both navicular and accessory navicular in all of the athletes (27/27, 100%). But it was only present in 80% (16/20) for nonathletes ( $P = .012$ ).

**CONCLUSION:**

The radiologic findings and clinical course of athletes were different from that of the general population. Their symptoms were more refractory to conservative treatment than the nonathletes group. Therefore, early operative treatment could be considered in cases of symptomatic ANS especially for athletes.

**LEVEL OF EVIDENCE:**

Level III, retrospective comparative case series.

**KEYWORDS:** accessory navicular syndrome; athletic performance; midfoot

PMID: 27090634

**41 A. ACHILLES TENDON AND CALF****Surgical repair**

BMC Musculoskelet Disord. 2016 May 10;17(1):207. doi: 10.1186/s12891-016-1061-4.

**Surgical treatment for achilles tendinopathy - a systematic review.**

Lohrer H<sup>1,2</sup>, David S<sup>3</sup>, Nauck T<sup>4</sup>.

**BACKGROUND:**

The purpose of this systematic review is to analyse the results of operative treatment for midportion Achilles tendinopathy and to provide evidence based recommendation for the indication of the individual published techniques.

**METHODS:**

MEDLINE, Cochrane Database, ISI Web of Knowledge and Google databases (1945 till September 2014) were electronically searched. The quality of the included articles was evaluated using the Coleman Methodology Score. Success rates, patient satisfaction, and the complication rates were determined.

**RESULTS:**

Twenty studies met our inclusion criteria. A total of 801 tendons were treated in 714 patients with open or minimally invasive techniques. The mean success rate was 83.4 %. Complications were reported in 6.3 % of the cases. The articles on minimally invasive techniques and open procedures reported on an average success rate of 83.6 % and 78.9 (p = 0.987). Patient satisfaction rates for minimally invasive techniques and open procedures were 78.5 % and 78.1 % (p = 0.211). The complication rate was 5.3 % for the minimally invasive techniques and 10.5 % for the open procedures (p = 0.053).

**CONCLUSION:**

We conclude that success rates of minimally invasive and open treatments are not different and that there is no difference in patient satisfaction but there is a tendency for more complications to occur in open procedures.

**KEYWORDS:** Achilles tendinopathy; Midportion; Noninsertional; Operative treatment; Systematic review  
PMID: 27165287

### 44. RHUMATOID ARTHRITIS

#### OA and AA population

#### **Race, pain and pain catastrophizing among African Americans and non-Hispanic Whites with osteoarthritis pain**

The Journal of Pain, 05/11/2016 Walker J, et al.

African Americans with osteoarthritis (OA) experience higher rates of OA pain in comparison to their non-Hispanic White counterparts. It is essential to understand factors related to this disparity among African Americans because OA pain can lead to poorer function, more disability and poorer quality of life. Pain catastrophizing (Cat) is a negative cognitive affective style that is well-recognized as an important factor in the pain experience among adults with chronic pain conditions such as OA.

**53. CORE****Core endurance**

J Manipulative Physiol Ther. 2016 May 7. pii: S0161-4754(16)30033-1. doi: 10.1016/j.jmpt.2016.04.003.

**The Relationship Between Clinical Instability and Endurance Tests, Pain, and Disability in Nonspecific Low Back Pain.**

Vanti C<sup>1</sup>, Conti C<sup>2</sup>, Faresin F<sup>3</sup>, Ferrari S<sup>4</sup>, Piccarreta R<sup>5</sup>.

**OBJECTIVE:**

The aims of this study were (1) to investigate the relationship between clinical tests detecting spinal instability and the perceived pain and disability in nonspecific low back pain and (2) to investigate the relationship between endurance and instability tests.

**METHODS:**

Four instability tests (aberrant movements, active straight leg raising, prone instability test, and passive lumbar extension test) and 2 endurance tests (prone bridge test [PBT] and supine bridge test [SBT]) were performed on 101 participants. Their results were compared with the Numerical Rating Scale and the Oswestry Disability Index evaluating pain and disability, respectively.

**RESULTS:**

A low to moderate significant relationship between pain, disability, and all tests with the exception of PBT was observed. A low to moderate significant relationship between endurance tests and instability tests was also shown. The results of PBT and SBT were significantly related to the duration of symptoms ( $P = .0014$  and  $P = .0203$ , respectively).

**CONCLUSION:**

The results of endurance and instability tests appear to be related to the amount of pain and the disability in nonspecific low back pain. The persistence of pain significantly reduces anterior and posterior core muscle endurance.

**KEYWORDS:** Joint Instability; Low Back Pain; Musculoskeletal Diseases; Physical Endurance; Physical Examination  
PMID: 27167368

**56. ATHLETICS****Conditioning in youth and adult health**

Med Sci Sports Exerc. 2016 Apr 29.

**Childhood Muscular Fitness Phenotypes and Adult Metabolic Syndrome.**

Fraser BJ<sup>1</sup>, Huynh QL, Schmidt MD, Dwyer T, Venn AJ, Magnussen CG.

**INTRODUCTION:**

To determine whether childhood muscular fitness phenotypes (strength, endurance, power) are independently associated with adult metabolic syndrome (MetS).

**METHODS:**

Longitudinal study including 737 participants who had muscular fitness measures in 1985 when aged 9, 12, or 15 years and attended follow-up in young adulthood 20 years later when measures of MetS were collected. Childhood measures of muscular fitness included strength (right and left grip, leg, shoulder extension and flexion), endurance (number of push-ups in thirty seconds), and power (distance of a standing long jump). A muscular fitness score was created using all individual muscular fitness phenotypes. In adulthood, waist circumference, blood pressure, high-density lipoprotein cholesterol, triglycerides, and glucose were measured. Adult outcomes were MetS defined using the Harmonized definition and a continuous metabolic syndrome (cMetS) risk score.

**RESULTS:**

Participants with childhood muscular strength, muscular power and combined muscular fitness score in the highest third had significantly lower relative risk (RR) for MetS and a lower cMetS score in adulthood independent of cardiorespiratory fitness (CRF), than those in the lowest third (strength: RR=0.39 (0.19,0.78);  $\beta$ =-0.39 (-0.52, -0.25), power: RR=0.32 (0.15,0.68);  $\beta$ =-0.39 (-0.53, -0.26), fitness score: RR=0.30 (0.14,0.63);  $\beta$ =-0.45 (-0.58, -0.31)). However, adjustment for childhood waist circumference reduced the effect sizes for both adult outcomes by 44-51%.

**CONCLUSION:**

Phenotypes of childhood muscular fitness predict adult MetS independent of CRF. Although approximately half of the effect of childhood muscular fitness on adult MetS is potentially being mediated by child waist circumference, these data suggest promotion of muscular fitness among children might provide additional protection against developing adult MetS.

PMID: 27128670

**Exercise and sex related mood**

Med Sci Sports Exerc. 2016 Apr 29.

**Sex-Related Differences in Mood Responses to Acute Aerobic Exercise.**

McDowell CP<sup>1</sup>, Campbell MJ, Herring MP.

Though some evidence supports stronger mood improvements in response to acute exercise among women, sex-related differences remain understudied.

**PURPOSE:**

To quantify and compare differences in baseline mood and the magnitude of mood responses to either acute aerobic exercise or quiet rest among young adult men and women.

**METHODS:**

Fifty-three (27 M; 26 F) young adults completed two counterbalanced conditions: 30-min of vigorous treadmill exercise or 30-min of quiet rest. Outcomes included state anxiety, worry symptoms, and feelings of tension, depression, vigor, fatigue, anger, and confusion. ANOVA and RM-ANOVA examined sex-related differences at baseline and across condition and time, respectively. Hedges' d (95% Cis) were calculated to quantify and compare the magnitude of change in response to exercise compared to control.

**RESULTS:**

Females were more likely to report scores indicative of depression (QIDS>5; 38.5% vs. 18.5%) and high trait anxiety ( $\geq 1SD$  above age- and sex-related norm on STAI-Y2; 26.9% vs. 3.7%). Baseline worry symptoms and trait anxiety were significantly higher among females ( $p < 0.02$ ). Though repeated measures models did not support statistically significant differences between sexes, the magnitude of improvement in mood outcomes was larger among females than males for all outcomes other than feelings of tension. Compared to quiet rest, exercise significantly improved feelings of fatigue ( $d = 0.59$  [0.01, 1.17]), confusion ( $d = 0.83$  [0.24, 1.41]), and energy ( $d = 1.67$  [1.02, 2.33]), and total mood disturbance ( $d = 1.09$  [0.49, 1.70]), and resulted in a non-significant moderate-sized improvement in state anxiety ( $d = 0.51$  [-0.07, 1.08]) among females.

**CONCLUSION:**

Findings support potential sex-related differences in mood response to acute aerobic exercise, with larger improvements found among females. Future research should confirm findings and examine putative mechanisms of sex-related differences in mood responses to exercise.

**Young pitchers elbows**

J Bone Joint Surg Am. 2016 May 4;98(9):761-7. doi: 10.2106/JBJS.15.01017.

**Preseason Assessment of Radiographic Abnormalities in Elbows of Little League Baseball Players.**

Pennock AT<sup>1</sup>, Pytiak A<sup>2</sup>, Stearns P<sup>2</sup>, Roocroft JH<sup>2</sup>, Dwek J<sup>2</sup>, Kruk P<sup>2</sup>, Bastrom TP<sup>2</sup>.

**BACKGROUND:**

Youth baseball has been associated with elbow pain and elbow abnormalities, leading to the implementation of throwing and pitching guidelines. The purpose of the current study was to examine elbow abnormalities on magnetic resonance imaging (MRI) in asymptomatic Little League baseball players and to correlate these findings with the players' throwing history and physical examinations.

**METHODS:**

A prospective study of Little League players who were 10 to 13 years of age was performed. Players were recruited prior to the start of the season and underwent bilateral elbow MRI. All players underwent a physical examination and responded to a questionnaire addressing their playing history and any arm pain. The MRIs were read by 2 radiologists. Responses on the questionnaire and physical examination findings were compared between subjects with and without positive MRI findings utilizing chi-square and analysis of variance techniques.

**RESULTS:**

Twenty-six players were enrolled. The majority (77%) were right-handed and 14 (54%) were a pitcher and/or catcher. Nine players (35%) had 12 positive MRI findings: 7 findings of edema or signal change of the medial epicondyle apophysis, 2 findings of fragmentation of the medial epicondyle, and 3 findings of edema or signal change of the sublime tubercle. The prevalence of positive MRI findings and a history of arm pain were not greater in pitchers and catchers compared with other players. Players with a positive MRI finding demonstrated greater reduction in shoulder internal rotation (12°) compared with the nondominant arm (3°) ( $p = 0.04$ ). The two factors associated with a positive MRI finding were year-round play (47% of year-round players compared with 11% of non-year-round players;  $p < 0.01$ ) and working with a private coach (71% compared with 21%;  $p = 0.02$ ). Additionally, a history of pain was associated with year-round play and a private coach ( $p < 0.05$ ).

**CONCLUSIONS:**

MRI abnormalities involving the medial aspect of the elbow are common in year-round Little League baseball players, especially those with internal rotation deficits and private coaches. Although Little League guidelines potentially lessen abnormalities seen in pitchers, further refinement of these guidelines addressing year-round play, pain, and private coaching should be considered.

**LEVEL OF EVIDENCE:**

Prognostic Level III. See Instructions for Authors for a complete description of levels of evidence.

PMID:27147689

**57. GAIT****Gait speed and depression**

Arthritis Care Res (Hoboken). 2016 May 9. doi: 10.1002/acr.22928.

**The association of slow gait speed with trajectories of worsening depressive symptoms in knee osteoarthritis: An observational study.**

White DK<sup>1</sup>, Neogi T<sup>2</sup>, Zhang Y<sup>2</sup>, Niu J<sup>2</sup>, Katz PP<sup>3</sup>.

**BACKGROUND:**

The purpose of this study was to investigate the association of slow gait speed, defined as walking slower than what is necessary for the community with trajectories of depressive symptoms over 7 years among people with or at high risk of knee OA.

**METHODS:**

Using data from the Osteoarthritis Initiative, we described trajectories of depressive symptoms measured annually with the Center for Epidemiologic Studies Depression Scale (CES-D). We categorized speed during a 20-meter walk < 1.2 m/s as 'slow gait speed'. We used a group-based method (PROC TRAJ) to agnostically identify homogeneous clusters of depressive symptom trajectories. We then examined the association of slow gait speed with depressive symptom trajectories using multinomial logistic regression adjusted for potential confounders.

**RESULTS:**

From the 3939 participants included (age 61.4 ± 9.2, BMI 28.4 ± 4.7, 58% women, 63% college degree), we identified five trajectories. The first three were stable over time and included 74% of the sample. The remainder had worsening depressive symptoms over time. Slow gait speed was associated with 2.0 times the odds of having the worst depressive symptoms trajectory compared those without slow gait speed.

**CONCLUSION:**

Slow gait speed may represent important risk factor for worsening depressive symptoms over time in people with or at high risk of knee OA, and may signal the need for rehabilitation. This article is protected by copyright. All rights reserved.

PMID: 27158972

**59. PAIN****Inflammation in farmers**

BMC Musculoskelet Disord. 2016 May 10;17(1):206. doi: 10.1186/s12891-016-1059-y.

**Biomarkers of systemic inflammation in farmers with musculoskeletal disorders; a plasma proteomic study.**

Ghafouri B<sup>1,2</sup>, Carlsson A<sup>3</sup>, Holmberg S<sup>4</sup>, Thelin A<sup>5</sup>, Tagesson C<sup>6</sup>.

**BACKGROUND:**

Farmers have an increased risk for musculoskeletal disorders (MSD) such as osteoarthritis of the hip, low back pain, and neck and upper limb complaints. The underlying mechanisms are not fully understood. Work-related exposures and inflammatory responses might be involved. Our objective was to identify plasma proteins that differentiated farmers with MSD from rural referents.

**METHODS:**

Plasma samples from 13 farmers with MSD and rural referents were included in the investigation. Gel based proteomics was used for protein analysis and proteins that differed significantly between the groups were identified by mass spectrometry.

**RESULTS:**

In total, 15 proteins differed significantly between the groups. The levels of leucine-rich alpha-2-glycoprotein, haptoglobin, complement factor B, serotransferrin, one isoform of kininogen, one isoform of alpha-1-antitrypsin, and two isoforms of hemopexin were higher in farmers with MSD than in referents. On the other hand, the levels of alpha-2-HS-glycoprotein, alpha-1B-glycoprotein, vitamin D-binding protein, apolipoprotein A1, antithrombin, one isoform of kininogen, and one isoform of alpha-1-antitrypsin were lower in farmers than in referents. Many of the identified proteins are known to be involved in inflammation.

**CONCLUSIONS:**

Farmers with MSD had altered plasma levels of protein biomarkers compared to the referents, indicating that farmers with MSD may be subject to a more systemic inflammation. It is possible that the identified differences of proteins may give clues to the biochemical changes occurring during the development and progression of MSD in farmers, and that one or several of these protein biomarkers might eventually be used to identify and prevent work-related MSD.

**KEYWORDS:**

Farmers; Musculoskeletal disorder; Occupational medicine; Proteomic; Systemic inflammation

**Therapeutic interventions**

BMC Musculoskelet Disord. 2016 Apr 30;17(1):194. doi: 10.1186/s12891-016-1049-0.

**The clinical characteristics of older people with chronic multiple-site joint pains and their utilisation of therapeutic interventions: data from a prospective cohort study.**

Raja R<sup>1</sup>, Dube B<sup>1</sup>, Hensor EM<sup>1</sup>, Hogg SF<sup>1</sup>, Conaghan PG<sup>2</sup>, Kingsbury SR<sup>1</sup>.

**BACKGROUND:**

Chronic multiple-site joint pain (MSJP) is common in older people and associated with poor outcomes, yet under-researched. Our aim was to detail the clinical characteristics of people with MSJP and their utilisation of therapies.

**METHODS:**

MSJP was defined as pain in at least one large joint and one other joint for >6 weeks in the last three months. A mixed community, primary and secondary care cohort of people >50 years old underwent detailed history and examination by a single clinician. Treatment utilisation was recorded comprehensively.

**RESULTS:**

201 adults were recruited, 82 % women, mean age 63, BMI 31 kg/m<sup>2</sup>. Median number of painful joints per patient was 6 (IQR 4-9; range 2-17); most common painful sites were knee (84 %), lower back (62 %) and shoulder (47 %). 194/201 (96 %) had an osteoarthritis (OA) diagnosis, 155/194 (80 %) also had soft tissue pathology and 72 % had back problems. 85 % had OA at multiple sites. Upper and lower limb weakness was common (90 and 77 % respectively). Lower limb weakness was significantly associated with obesity. Only 26 % had received written information about their joints. Though 79 % had attended physiotherapy, the majority (93 %) had muscle weakness. Only 36 % of overweight participants had accessed weight-loss support. Half of those with foot pain had seen a podiatrist or used appliances. Multiple concurrent pharmacological therapies were used by 47 %.

**CONCLUSION:**

MSJP represents a combination of OA, back pain and soft tissue disorders; muscle weakness is extremely common. Therapies appear underutilised in people with MJSP. Identifying the reasons for this should guide effective intervention research.

**KEYWORDS:** Back pain; Joint pain; Multiple site; Osteoarthritis; Soft tissue disorders; Therapeutics

PMID: 27139716

**60. COMPLEX REGIONAL PAIN**

No changes found in the brains function

Eur J Pain. 2016 May 10. doi: 10.1002/ejp.882

**Is the brain of complex regional pain syndrome patients truly different?**

van Velzen GA<sup>1,2</sup>, Rombouts SA<sup>3,4</sup>, van Buchem MA<sup>3,5</sup>, Marinus J<sup>1,2</sup>, van Hilten JJ<sup>1,2</sup>.

**BACKGROUND:**

In recent years, changes in brain structure and function have been studied extensively in patients with complex regional pain syndrome (CRPS) following clinical observations of altered central processing of sensory stimuli and motor control. However, concerning MRI data, the evidence is complex to interpret due to heterogeneity in statistical methods and results.

**METHOD:**

The aim of this study was to determine if CRPS patients exhibit specific, clinically relevant changes in brain structure and function in rest. We do this by presenting MRI data on brain structure and function in 19 chronic, female CRPS patients and age- and sex-matched healthy controls (HCs). In addition, we analyse and report the data in multiple ways to make comparison with previous studies possible and to demonstrate the effect of different statistical methods, in particular, concerning the correction for multiple testing.

**RESULTS:**

Using family-wise error (FWE) correction for multiple testing, in our group of CRPS patients, we find no specific difference in brain structure or function in rest in comparison to HCs. In addition, we argue that previously found MRI results in the literature are inconsistent in terms of localization, quantity and directionality of the reported changes in brain structure and function.

**CONCLUSION:**

Previously published MRI-based evidence for altered brain structure and function in rest in CRPS patients is not consistent and our data suggests that no such phenomenon exists. **WHAT DOES THIS STUDY ADD?:** This article does not replicate the previous found results. The reported evidence in MRI literature of aberrant neuroplasticity in CRPS patients is inconsistent in terms of localization, quantity and directionality of changes in brain structure and function.  
PMID:27161331

**62 A. NUTRITION/VITAMINS****Ginkgo biloba**

Hum Psychopharmacol. 2016 May;31(3):227-42. doi: 10.1002/hup.2534.

**Effects of Ginkgo biloba extract EGb 761® on cognitive control functions, mental activity of the prefrontal cortex and stress reactivity in elderly adults with subjective memory impairment - a randomized double-blind placebo-controlled trial.**

Beck SM<sup>1,2</sup>, Ruge H<sup>1,2</sup>, Schindler C<sup>3,4</sup>, Burkart M<sup>5</sup>, Miller R<sup>1</sup>, Kirschbaum C<sup>1</sup>, Goschke T<sup>1,2</sup>.

**OBJECTIVE:**

Cognitive control as well as stress reactivity is assumed to depend on prefrontal dopamine and decline with age. Because Ginkgo biloba extract EGb761 increases prefrontal dopamine in animals, we assessed its effects on cognitive functions related to prefrontal dopamine.

**METHODS:**

Effects of 240-mg EGb761 daily on task-set-switching, response-inhibition, delayed response, prospective-memory, task-related fMRI-BOLD-signals and the Trier Social Stress-Test were explored in a randomized, placebo-controlled, double-blind pilot-trial in 61 elderly volunteers with subjective memory impairment.

**RESULTS:**

Baseline-fMRI-data showed BOLD-responses in regions commonly activated by the specific tasks. Task-switch-costs decreased with EGb761 compared to placebo (ANOVA-interaction: Group × Time × Switch-Costs  $p = 0.018$ , multiple tests uncorrected), indicating improved cognitive flexibility. Go-NoGo-task reaction-times corrected for error-rates indicated a trend for improved response inhibition. No treatment effects were found for the delayed response and prospective-memory tasks and fMRI-data. A non-significant trend indicated a potentially accelerated endocrine stress-recovery. EGb761 was safe and well tolerated.

**CONCLUSION:**

We observed indications for improved cognitive flexibility without changes in brain activation, suggesting increased processing efficiency with EGb761. Together with a trend for improved response inhibition results are compatible with mild enhancement of prefrontal dopamine. These conclusions on potential beneficial effect of EGb761 on prefrontal dopaminergic functions should be confirmed by direct measurements. © 2016 The Authors. Human Psychopharmacology: Clinical and Experimental published by John Wiley & Sons, Ltd.

**KEYWORDS:** *EGb 761; cognitive control; dopamine; fMRI; ginkgo; task switch*