

**ABSTRACTS**

**LUMBAR SPINE**

**PELVIC GIRDLE**

**VISCERA**

**THORACIC SPINE**

**CERVICAL SPINE**

**CRANIUM/TMJ**

**HEADACHES**

**CONCUSSIONS**

**SHOULDER GIRDLE**

**GLENOHUMERAL/SHOULDER**

**ELBOW**

**WRIST AND HAND**

**HIP**

**KNEE**

**FOOT AND ANKLE**

**MANUAL THERAPY**

**STM/STRETCHING/MUSCLES**

**BET**

**ATHLETICS**

**RUNNING GAIT**

**PAIN**

**COMPLEX REGIONAL PAIN**

**FIBROMYALGIA**

**NUTRITION/VITAMINS/MEDICATION/TOPICALS**

**NEUROLOGICAL CONDITIONS**

LBP

Scheuermann's disease

Eur Spine J. 2014 Oct 4**Comparison of radiographic sagittal spinopelvic alignment between skeletally immature and skeletally mature individuals with Scheuermann's disease.**Tyrakowski M<sup>1</sup>, Janusz P, Mardjetko S, Kotwicki T, Siemionow K.**Abstract****PURPOSE:**

The aim of this study was to compare radiographic sagittal spinopelvic parameters between skeletally immature and skeletally mature patients with Scheuermann's disease (SD).

**METHODS:**

Cross-sectional analysis of standing postero-anterior and lateral radiographs of the spine of patients with SD was performed. Sagittal vertical axis (SVA), thoracic kyphosis (TK), thoracolumbar kyphosis (TLK), lumbar lordosis (LL), pelvic incidence (PI), pelvic tilt (PT), and sacral slope (SS) were measured on the lateral radiographs. Risser's sign was assessed on the postero-anterior radiographs. All of the parameters measured were compared between skeletally immature (Risser's sign 0-3) versus mature patients (Risser's sign 5). PI, PT, and SS in both groups were compared to PI, PT, and SS reported for normal children, adolescents, and adults.

**RESULTS:**

Sixty-six patients with SD (33 immature and 33 mature) were retrospectively reviewed and included in the study. There was no significant difference between the two groups of SD patients in: SVA (-16.6 vs. -22.9 mm,  $p = 0.74$ ), TK ( $57.8^\circ$  vs.  $56^\circ$ ,  $p = 0.66$ ), TLK ( $7.8^\circ$  vs.  $11.7^\circ$ ,  $p = 0.14$ ), LL ( $63.2^\circ$  vs.  $62.2^\circ$ ,  $p = 0.74$ ), PI ( $36.7^\circ$  vs.  $39.4^\circ$ ,  $p = 0.20$ ), PT ( $3.8^\circ$  vs.  $7.3^\circ$ ,  $p = 0.10$ ), and SS ( $32.8^\circ$  vs.  $32.1^\circ$ ,  $p = 0.75$ ). Both, the immature and mature group of SD patients presented significantly lower PI and SS than normal children, adolescents, and adults, and significantly lower PT than normal adults.

**CONCLUSIONS:**

There is no significant difference in sagittal spinopelvic parameters between skeletally immature and mature subjects with SD. Pelvic incidence in both groups of SD patients was significantly lower than PI in normal children, adolescents, and adults. This challenges the role of PI in predicting desired LL in patients with SD.

PMID: 25281331

## Intensive rehabilitation program

### **Functional restoration of the spine: Effect of initial pain level on the performance of subjects with chronic low back pain**

Pain Research and Management, 10/06/2014 Clinical Article

Caby I, et al. – **Purpose:** The aim of this study is to assess and evaluate the responses of subjects with very painful chronic low back pain in a dynamic and intensive care program. Patients with very painful chronic low back pain respond favourably to the dynamic and intensive program. The intensity of low back pain had no effect on responses to the program. The spine functional restoration program enables patients to better manage their pain, whatever its level.

#### **Methods**

- A total of 134 patients with chronic low back pain were included in a spine functional restoration program for five weeks.
- The subjects were classified into two groups by level of pain: a group experiencing severe pain (n=28) and a group experiencing mild to moderate pain (n=106).
- All subjects received identical support consisting primarily of physiotherapy, occupational therapy, cardiovascular and muscular reconditioning as well as psychological counselling.
- The physical parameters (flexibility, muscular strength) and psychological (quality of life) were measured before (T0) and after the program (T5sem).

#### **Results and Conclusions**

- All physical and functional performances of the subjects with severe pain were lower and the impact of back pain on quality of life for these subjects was increased.
- All significant differences at T0 between the two groups were no longer present at T5sem.

## Ablation therapy for LBP

### Radiofrequency ablation for chronic low back pain: A systematic review of randomized controlled trials

Pain Research and Management, 10/06/2014 Clinical Article

Leggett LE, et al. – **Purpose:** The aim of this study is to determine the efficacy of RFA for chronic low back pain associated with lumbar facet joints, sacroiliac joints, discogenic low back pain and the coccyx. While the majority of the studies focusing on lumbar facet joints and sacroiliac joints suggest that RFA significantly reduces pain in short-term follow-up, the evidence base for discogenic low back pain is mixed. There is no RCT evidence for RFA for the coccyx. Future studies should examine the clinical significance of the achieved pain reduction and the long-term efficacy of RFA.

#### Methods

- A systematic review was conducted.
- Medline, EMBASE, PubMed, SPORTDiscus, CINAHL and the Cochrane Library were searched up to August 2013.
- Abstracts and full-text articles were reviewed in duplicate.
- Included articles were sham-controlled randomized controlled trials (RCTs), assessed the efficacy of RFA, reported at least one month of follow-up and included participants who had experienced back pain for at least three months.
- Data were extracted in duplicate and quality was assessed using the Cochrane Risk of Bias tool.
- Due to heterogeneity, as well as a lack of reported mean differences and SDs, meta-analysis was not possible using these data.

#### Results and Conclusions

- The present systematic review retrieved 1063 abstracts.
- Eleven sham-controlled RCTs were included: three studies involving discogenic back pain; six studies involving lumbar facet joint pain; and two studies involving sacroiliac joint pain.
- No studies were identified assessing the coccyx.
- The evidence supports RFA as an efficacious treatment for lumbar facet joint and sacroiliac joint pain, with five of six and both of the RCTs demonstrating statistically significant pain reductions, respectively.
- The evidence supporting RFA for the treatment of discogenic pain is mixed.

## Functional restoration

### **Functional restoration of the spine: Effect of initial pain level on the performance of subjects with chronic low back pain.**

Pain Research and Management, 10/06/2014 Clinical Article

Caby I, et al. – **Purpose:** The aim of this study is to assess and evaluate the responses of subjects with very painful chronic low back pain in a dynamic and intensive care program. Patients with very painful chronic low back pain respond favourably to the dynamic and intensive program. The intensity of low back pain had no effect on responses to the program. The spine functional restoration program enables patients to better manage their pain, whatever its level.

#### **Methods**

- A total of 134 patients with chronic low back pain were included in a spine functional restoration program for five weeks.
- The subjects were classified into two groups by level of pain: a group experiencing severe pain (n=28) and a group experiencing mild to moderate pain (n=106).
- All subjects received identical support consisting primarily of physiotherapy, occupational therapy, cardiovascular and muscular reconditioning as well as psychological counselling.
- The physical parameters (flexibility, muscular strength) and psychological (quality of life) were measured before (T0) and after the program (T5sem).

#### **Results and Conclusions**

- All physical and functional performances of the subjects with severe pain were lower and the impact of back pain on quality of life for these subjects was increased.
- All significant differences at T0 between the two groups were no longer present at T5sem.

Fear avoidance

Pain Pract. 2014 Oct 1.

**Do Teaching General Practitioners' Fear-Avoidance Beliefs Influence Their Management of Patients with Low Back Pain?**

Gremeaux V<sup>1</sup>, Coudeyre E, Viviez T, Bousquet PJ, Dupeyron A.

**Abstract**

**OBJECTIVES:**

To describe fear-avoidance beliefs about low back pain (LBP) in a sample of teaching general practitioners (TGPs) and to investigate the impact on following the guidelines for LBP.

**METHODS:**

A sample of 112 French TGPs were contacted to complete a self-administered questionnaire including socio-demographic and professional data, personal history of LBP, CME about LBP and usual practices, and their low back pain beliefs using the Fear-Avoidance Beliefs Questionnaire (FABQ) and the Back Belief Questionnaire (BBQ).

**RESULTS:**

Forty-seven responded, 48% treated more than 10 LBP patients per month, and 45% participated in an educational session on LBP during the previous 3 years. Seventy percent reported a previous episode of acute LBP, while 30% suffered from chronic LBP. The median scores for the FABQ-phys and work were 8 (4 to 10) and 17 (11 to 21), and 35 (31 to 38) for the BBQ. There were no correlations between age or years of practice and FABQ scores. TGPs suffering more than 1 acute LBP episode per month had a lower BBQ score ( $P < 0.05$ ). Those prescribing more imaging exams in acute LBP had higher FABQ and lower BBQ scores, while those who recommended rest in both acute and chronic LBP had a higher FABQ-phys score.

**DISCUSSION:**

Teaching general practitioners' fear-avoidance beliefs about LBP are lower than previously reported by their GP colleagues but still negatively influence the way they follow guidelines for LBP patients. This may influence the way they teach the management of LBP.

© 2014 World Institute of Pain.

**KEYWORDS:**

back relief questionnaire; behavioral medicine; fear avoidance; fear-avoidance beliefs questionnaire; low back pain; medical education

PMID: 25269428

**SURGERY/LBP****Sensitivity and post surgical pain**

Pain Med. 2014 Oct 7.

**Prediction of Postoperative Pain Intensity after Lumbar Spinal Surgery Using Pain Sensitivity and Preoperative Back Pain Severity.**

Kim HJ<sup>1</sup>, Park JH, Kim JW, Kang KT, Chang BS, Lee CK, Yeom JS.

**Abstract****OBJECTIVES:**

To investigate the role of preoperative pain sensitivity and preoperative symptom severity for prediction of postoperative pain intensity after lumbar spine surgery.

**METHODS:**

This study consisted of two groups who underwent decompression surgery alone (62 patients) or decompression with fusion surgery (37 patients) for lumbar spinal stenosis (LSS). Pain Sensitivity Questionnaire (PSQ) and visual analog pain scale (VAS) for back pain and leg pain were collected preoperatively with detailed medical history. The assessment was performed immediately after surgery when the patients had completely recovered and regained their complete consciousness from general anesthesia (H0) and subsequently 4, 8, 18, 30, 48, and 72 hours (H4, H8, H18, H30, H48, and H72) thereafter as they recovered.

**RESULTS:**

Both groups showed a decrease in back pain and leg pain with the time postoperatively. In fusion group, preoperative VAS for back pain was significantly correlated with postoperative VAS for back pain at H0, H4, H8, and H18, and PSQ minor/total PSQ also showed a significant correlation with postoperative back pain at H48 and H72. In contrast, only total PSQ and PSQ minors were significantly correlated with postoperative back pain at H18 and H30 in decompression group. Hierarchical regression analysis finally showed that each preoperative back pain and PSQ minor was predictive of immediate postoperative back pain (from H0 to H18) in fusion group and delayed postoperative back pain (H18, H30) in decompression group.

**CONCLUSIONS:**

The study highlights that each preoperative back pain and individual pain sensitivity could predict the different aspects of postoperative pain after lumbar surgery.

Wiley Periodicals, Inc.

**KEYWORDS:**

Lumbar Spinal Surgery; Pain Sensitivity; Pain Sensitivity Questionnaire; Postoperative Pain; Preoperative Back Pain

PMID: 25288391

**PT in post-surgical management**

BMC Musculoskelet Disord. 2014 Oct 1

**A comparative effectiveness trial of postoperative management for lumbar spine surgery: changing behavior through physical therapy (CBPT) study protocol.**

Archer KR, Coronado RA, Haug CM, Vanston SW, Devin CJ, Fannesbeck CJ, Aaronson OS, Cheng JS, Skolasky RL, Riley LH 3rd, Wegener ST.

**Abstract****BACKGROUND AND PURPOSE:**

The United States has the highest rate of lumbar spine surgery in the world, with rates increasing over 200% since 1990. Medicare spends over \$1 billion annually on lumbar spine surgery. Despite surgical advances, up to 40% of patients report chronic pain and disability following surgery. Our work has demonstrated that fear of movement is a risk factor for increased pain and disability and decreased physical function in patients following lumbar spine surgery for degenerative conditions. Cognitive-behavioral therapy and self-management treatments have the potential to address psychosocial risk factors and improve outcomes after spine surgery, but are unavailable or insufficiently adapted for postoperative care. Our research team developed a cognitive-behavioral based self-management approach to postoperative rehabilitation (Changing Behavior through Physical Therapy (CBPT)). Pilot testing of the CBPT program demonstrated greater improvement in pain, disability, physical and mental health, and physical performance compared to education. The current study compares which of two treatments provided by telephone - a CBPT Program or an Education Program about postoperative recovery - are more effective for improving patient-centered outcomes in adults following lumbar spine surgery for degenerative conditions.

**METHODS AND DESIGN:** A multi-center, comparative effectiveness trial will be conducted. Two hundred and sixty patients undergoing lumbar spine surgery for degenerative conditions will be recruited from two medical centers and community surgical practices. Participants will be randomly assigned to CBPT or Education at 6 weeks following surgery. Treatments consist of six weekly telephone sessions with a trained physical therapist. The primary outcome will be disability and secondary outcomes include pain, general health, and physical activity. Outcomes will be assessed preoperatively and at 6 weeks, 6 months and 12 months after surgery by an assessor masked to group allocation.

**DISCUSSION AND CONCLUSION:**

Effective rehabilitation treatments that can guide clinicians in their recommendations, and patients in their actions will have the potential to effect change in current clinical practice.

PMID: 25273991

## PELVIC GIRDLE

### SI joint referral pain patterns

Eur Spine J. 2014 Oct 5.

#### **Referred pain location depends on the affected section of the sacroiliac joint.**

Kurosawa D<sup>1</sup>, Murakami E, Aizawa T.

#### **Abstract**

##### **PURPOSE:**

Pain referred from the sacroiliac joint (SIJ) may originate in the joint's posterior ligamentous region. The site of referred pain may depend on which SIJ section is affected. This study aimed to determine the exact origin of pain referred from four SIJ sections.

##### **METHODS:**

The study included 50 patients with SIJ dysfunction, confirmed by more than 70 % pain relief after periarticular injection of local anesthetic into the SIJ. The posterior SIJ was divided into four sections-upper, middle, lower, and other (cranial portion of the ilium outside the SIJ)-designated sections 1, 2, 3, and 0, respectively. We then inserted a needle into the periarticular SIJ under fluoroscopy. After the patient identified the area(s) in which the needle insertion produced referred pain, we injected a mixture of 2 % lidocaine and contrast medium into the corresponding SIJ section.

##### **RESULTS:**

Referred pain from SIJ section 0 was mainly located in the upper buttock along the iliac crest; pain from section 1, around the posterosuperior iliac spine; pain from section 2, in the middle buttock area; pain from section 3, in the lower buttock. In all, 22 (44.0 %) patients complained of groin pain, which was slightly relieved by lidocaine injection into SIJ sections 1 and 0.

##### **CONCLUSIONS:**

Dysfunctional upper sections of the SIJ are associated with pain in the upper buttock and lower sections with pain in the lower buttock. Groin pain might be referred from the upper SIJ sections.

PMID: 25283251

**VISCERA****Pelvic pain and alternative approaches**

Pain Med. 2014 Oct 3.

**Prevalence and Use of Complementary Health Approaches among Women with Chronic Pelvic Pain in a Prospective Cohort Study.**

Chao MT<sup>1</sup>, Abercrombie PD, Nakagawa S, Gregorich SE, Learman LA, Kuppermann M.

**Abstract****OBJECTIVE:**

The aim of this study was to examine the prevalence of and factors associated with use of complementary health approaches among women with chronic pelvic pain (CPP).

**DESIGN:**

We analyzed data from the Study of Pelvic Problems, Hysterectomy, and Intervention Alternatives, a prospective cohort study of women seeking care for noncancerous pelvic problems with intact uteri at enrollment. Among a subset of 699 participants who reported having CPP, we analyzed the prevalence of complementary health approaches used and associated patient sociodemographic and clinical characteristics, health-related quality of life, attitudes and beliefs, and conventional health care practices.

**RESULTS:**

At baseline, slightly over one-half (51%) of women with CPP used at least one complementary health approach in the past year, including acupuncture (8%), special foods or diets (22%), herbs (27%), and vitamins and minerals (29%). During follow-up surveys conducted annually for 4 years, a substantial proportion of women (44.8%) used complementary health approaches at more than half of the assessments. Users of complementary health approaches were more likely to undergo a hysterectomy or oophorectomy or to use gonadotropin-releasing hormone agonists or opioids during the study compared with nonusers. Women with CPP who used complementary health approaches also had more optimal health-related quality of life measured by the Pelvic Problem Impact Questionnaire (31.6 vs 25.6,  $P < 0.001$ ).

Comment [GJ1]:

**CONCLUSION(S):**

Many women with CPP consistently use complementary health approaches. The substantial interest in and high prevalence of complementary health approaches used alongside conventional medical approaches highlight the need for better understanding of multimodal approaches to address the complex condition of CPP.

Wiley Periodicals, Inc.

**KEYWORDS:**

Chronic Pelvic Pain; Complementary Health Approaches; Complementary Medicine; Integrative Medicine

PMID: 25279935

## CERVICAL SPINE

### Radiographic measurement of hypermobility in rotation

BMC Musculoskelet Disord. 2014 Oct 4

#### **Intraobserver and interobserver reliability of measures of cervical sagittal rotation.**

Jiang SD, Chen JW, Yang YH, Chen XD, Jiang LS.

#### **Abstract**

##### **BACKGROUND:**

Diagnosis and treatment decisions of cervical instability are made, in part, based on the clinician's assessment of sagittal rotation on flexion and extension radiographs. The objective of this study is to evaluate the intraobserver and interobserver reliability of three measurement techniques in assessing cervical sagittal rotation.

##### **METHODS:**

Fifty lateral radiographs of patients with single-level cervical degenerative disc were selected and measured on two separate occasions by three spine surgeons using three different measurement techniques. Cervical sagittal rotation was measured using three different techniques.

##### **RESULTS:**

Intraclass correlation coefficients were most consistent for Method 2 (ICC 0.93-0.96) followed by Method 1 (ICC 0.88-0.91) and Method 3 (ICC 0.81-0.87). Intraobserver agreement (% of repeated measures within 0.5[degree sign] of the original measurement) ranged between 76% and 96% for all techniques, with Method 2 showing the best agreement (92%-96%). Paired comparisons between observers varied considerably with interobserver reliability correlation coefficients ranging from 0.54 to 0.89. Method 2 showed the highest interobserver reliability coefficient (0.82, range 0.73-0.88). Method 2 was also more reliable for the classification of "instability." Intraobserver percent agreements ranged from 94 to 98% for Method 2 versus 84% to 90% for Method 1 and 78% to 86% for Method 3, while interobserver percent agreements ranged from 90% to 98% for Method 2 versus 86% to 94% for Method 1 and 74% to 84% for Method 3.

##### **CONCLUSIONS:**

Method 2 (measuring the angle from the inferior endplate of the vertebra above the degenerative disc and the inferior endplate of the vertebra below the degenerative disc) showed the best intraobserver and interobserver reliability overall in assessing cervical sagittal rotation.

PMID: 25281011

**Whiplash and male and females**

Pain Pract. 2014 Sep 27.

**Sex Differences in Patients with Chronic Pain Following Whiplash Injury: The Role of Depression, Fear, Somatization, Social Support, and Personality Traits.**

Malfliet A<sup>1</sup>, De Kooning M, Inghelbrecht E, Hachimi-Idrissi S, Willems B, Bernheim J, Nijs J.

**Abstract****BACKGROUND:**

Chronic whiplash-associated disorders (chronic WAD) cover a large variety of clinical manifestations that can occur after a whiplash injury. Women have an increased risk of developing chronic WAD, and it is suggested that psychosocial factors are related to long-term pain and functioning following whiplash injury and persistence of chronic pain. This leads to the question whether there are sex differences in psychosocial factors in chronic WAD.

**METHODS:**

This study included 117 subjects who had experienced a whiplash injury at least 3 months before the start of the study (mean duration of pain:  $67.29 \pm 63.86$  months, range: 297 months). They were selected as chronically symptomatic, by excluding those who had recovered from their whiplash injury. Psychosocial aspects (including depression, fear, somatization, social support, and personality traits) were assessed by validated questionnaires, and sex differences were tested using a univariate analysis of variance (ANCOVA), with age and time from whiplash injury as covariates.

**RESULTS:**

No differences in depression, fear, somatization, discrepancy in social support personality trait, Neck Disability Index scores, physical functioning, bodily pain, or general health were present between women and men with chronic WAD. Women with chronic WAD reported higher levels of emotional support in problem situations and social companionship.

**CONCLUSION:**

Except for emotional support in problem situations and social companionship, psychosocial factors do not differ between men and women with chronic WAD. These findings imply little to no risk for sex bias in studies investigating psychosocial issues in patients with chronic WAD.

© 2014 World Institute of Pain.

**KEYWORDS:**

biopsychosocial factors; chronic neck pain; psychosocial factors; sex differences; social support; whiplash-associated disorders

PMID: 25262578

## OA IMPINGEMENT

### Chondral defects

Knee Surg Sports Traumatol Arthrosc. 2014 Oct 4.

#### **Is early treatment of cam-type femoroacetabular impingement the key to avoiding associated full thickness isolated chondral defects?**

Claßen T<sup>1</sup>, Körsmeier K, Kamminga M, Beck S, Rekowski J, Jäger M, Landgraeber S.

#### **Abstract**

##### **PURPOSE:**

Hip arthroscopy is a safe and reproducible method for treating femoroacetabular impingement (FAI) and has evolved greatly in recent years. But little is known about the influences on the outcome after surgery. The aims of the current study were to elucidate (1) which parameters can be used as a marker for the presence of chondral and labral lesions, (2) the postoperative clinical outcome, and (3) at which time after surgery recovery occurs.

##### **METHODS:**

A prospective study was performed with 177 patients who underwent hip arthroscopy because of cam-type FAI. The patients were examined preoperatively as well as 6 weeks and 6 months postoperatively, and their condition was rated according to the Western Ontario and McMaster Universities Arthritis Index (WOMAC) and the Non-Arthritic Hip Score (NAHS). Statistical analyses were performed to evaluate the influence of independent factors such as "patient age," "pain duration before surgery" on the clinical outcome, and the appearance of chondral or labral defects.

##### **RESULTS:**

The NAHS and WOMAC scores showed a significant enhancement 6 weeks after surgery. Only the NAHS showed a further improvement after 6 months. A positive correlation with the dependent variable "chondral lesion" was evaluated for the independent variables "pain duration before surgery," "preoperative NAHS," and "labrum lesion". Using ROC analysis, the optimal cutoff value of "pain duration before surgery" as a predictor was 9.5 months, for the NAHS 42.5 points. For the dependent variable, "6-month postoperative NAHS" significant correlations for the independent variables "age" and "pain duration before surgery" were revealed with a cutoff value of 55.5 years, respectively, 23.5 months.

##### **CONCLUSIONS:**

It was concluded from the results that the date of surgery is relevant for the appearance of chondral defects. Patient age is a further relevant factor for clinical outcome. Recovery after hip arthroscopy takes place mainly in the first 6 weeks after surgery.

##### **LEVEL OF EVIDENCE:**

Therapeutic study, Level III.

PMID: 25280948

**KNEE****Reflex changes with startle**

Scand J Med Sci Sports. 2014 Sep 11.

**An acoustic startle alters knee joint stiffness and neuromuscular control.**

DeAngelis AI<sup>1</sup>, Needle AR, Kaminski TW, Royer TR, Knight CA, Swanik CB.

**Abstract**

**Purpose:** Growing evidence suggests that the nervous system contributes to non-contact knee ligament injury, but limited evidence has measured the effect of extrinsic events on joint stability. Following unanticipated events, the startle reflex leads to universal stiffening of the limbs, but no studies have investigated how an acoustic startle influences knee stiffness and muscle activation during a dynamic knee perturbation.

**Methods:** Thirty-six individuals were tested for knee stiffness and muscle activation of the quadriceps and hamstrings. Subjects were seated and instructed to resist a 40-degree knee flexion perturbation from a relaxed state. During some trials, an acoustic startle (50 ms, 1000 Hz, 100 dB) was applied 100 ms prior to the perturbation. Knee stiffness, muscle amplitude, and timing were quantified across time, muscle, and startle conditions.

**Results:** The acoustic startle increased short-range (no startle:  $0.044 \pm 0.011$  N·m/deg/kg; average startle:  $0.047 \pm 0.01$  N·m/deg/kg) and total knee stiffness (no startle:  $0.036 \pm 0.01$  N·m/deg/kg; first startle  $0.027 \pm 0.02$  N·m/deg/kg). Additionally, the startle contributed to decreased [vastus medialis (VM):  $13.76 \pm 33.6\%$ ; vastus lateralis (VL):  $6.72 \pm 37.4\%$ ] but earlier (VM:  $0.133 \pm 0.17$  s; VL:  $0.124 \pm 0.17$  s) activation of the quadriceps muscles.

**Conclusions:** The results of this study indicate that the startle response can significantly disrupt knee stiffness regulation required to maintain joint stability. Further studies should explore the role of unanticipated events on unintentional injury.

**KEYWORDS:**

Anterior cruciate ligament; columnar buckling; injury prevention; joint stability

PMID: 25212407

**KNEE/ACL****Asymmetries**

Scand J Med Sci Sports. 2014 Sep 12.

**Lower limb asymmetry in mechanical muscle function: A comparison between ski racers with and without ACL reconstruction.**

Jordan MJ<sup>1</sup>, Aagaard P, Herzog W.

**Abstract**

**Purpose:** Due to a high incidence of anterior cruciate ligament (ACL) re-injury in alpine ski racers, this study aims to assess functional asymmetry in the countermovement jump (CMJ), squat jump (SJ), and leg muscle mass in elite ski racers with and without anterior cruciate ligament reconstruction (ACL-R).

**Methods:** Elite alpine skiers with ACL-R (n = 9; 26.2 ± 11.8 months post-op) and uninjured skiers (n = 9) participated in neuromuscular screening. Vertical ground reaction force during the CMJ and SJ was assessed using dual force plate methodology to obtain phase-specific bilateral asymmetry indices (AIs) for kinetic impulse (CMJ and SJ phase-specific kinetic impulse AI). Dual x-ray absorptiometry scanning was used to assess asymmetry in lower body muscle mass.

**Results:** Compared with controls, ACL-R skiers had increased AI in muscle mass (P < 0.001), kinetic impulse AI in the CMJ concentric phase (P < 0.05), and the final phase of the SJ (P < 0.05). Positive associations were observed between muscle mass and AI in the CMJ concentric phase (r = 0.57, P < 0.01) as well as in the late SJ phase (r = 0.66, P < 0.01).

**Conclusions:** Future research is required to assess the role of the CMJ and SJ phase-specific kinetic impulse AI as a part of a multifaceted approach for improving outcome following ACL-R in elite ski racers.

**KEYWORDS:**

Knee injury; injury prevention; return to sport screening; vertical jump

PMID: 25212216

## PATELLA

### Gait and patellofemoral ligament

Knee Surg Sports Traumatol Arthrosc. 2014 Oct 2.

#### **Recovery of gait pattern after medial patellofemoral ligament reconstruction for objective patellar instability.**

Carnesecchi O<sup>1</sup>, Philippot R, Boyer B, Farizon F, Edouard P.

##### **Abstract**

**Purpose:** Gait pattern alterations were previously reported in association with objective patellar instability (OPI). Gait pattern comparison between a series of patients having undergone medial patellofemoral ligament (MPFL) reconstruction and a sample of control subjects.

**Methods:** Thirty patients at 6 months postoperatively after MPFL reconstruction and thirty control subjects were enrolled in the study for a clinical and biomechanical assessment including gait analysis at three selected walking rates using the GAITRite<sup>®</sup> system. The mean raw IKDC score was 73 ( $\pm 19$ ), and the mean Kujala knee function was 84 ( $\pm 17.5$ ).

**Results:** The study of gait did not demonstrate any significant difference between the two groups at a normal and fast walking rate. At a 10 km/h running speed, the single-support phase was significantly shortened by a mean 2.33 % ( $p < 0.05$ ), the swing phase by a mean 2.64 % ( $p < 0.05$ ) and the double-support phase by a mean 3.49 % ( $p < 0.05$ ) on the operated side. MPFL reconstruction reported good midterm functional and clinical results in the management of OPI. At 6 months postoperatively, the patient gait pattern was similar to that observed in healthy subjects at a normal and fast walking speed. However, our study revealed persistent gait abnormalities at a 10 km/h running speed.

**Conclusions:** These gait alterations seemed to be related to the ligament reconstruction in itself due to the higher strain applied on the reconstructed MPFL during running cycle (10 km/h). Level of evidence IV.

PMID: 25274090

**Achilles and patellar tendinopathy**

Scand J Med Sci Sports. 2014 Sep 11.

**Prevalence of Achilles and patellar tendinopathy and their association to intratendinous changes in adolescent athletes.**

Cassel M<sup>1</sup>, Baur H, Hirschmüller A, Carlsohn A, Fröhlich K, Mayer F.

**Abstract**

**Purpose:** Achilles (AT) and patellar tendons (PT) are commonly affected by tendinopathy in adult athletes but prevalence of symptoms and morphological changes in adolescents is unclear. The study aimed to determine prevalence of tendinopathy and intratendinous changes in ATs and PTs of adolescent athletes.

**Methods:** A total of 760 adolescent athletes ( $13.0 \pm 1.9$  years;  $160 \pm 13$  cm;  $50 \pm 14$  kg) were examined. History, local clinical examination, and longitudinal Doppler ultrasound analysis for both ATs and PTs were performed including identification of intratendinous echoic changes and vascularization. Diagnosis of tendinopathy was complied clinically in case of positive history of tendon pain and tendon pain on palpation.

**Results:** Achilles tendinopathy was diagnosed in 1.8% and patellar tendinopathy in 5.8%. Vascularizations were visible in 3.0% of ATs and 11.4% of PTs, hypoechogenicities in 0.7% and 3.2% as well as hyperechogenicities in 0% and 0.3%, respectively. Vascularizations and hypoechogenicities were statistically significantly more often in males than in females ( $P \leq 0.02$ ). Subjects with patellar tendinopathy had higher prevalence of structural intratendinous changes than those without PT symptoms ( $P \leq 0.001$ ). In adolescent athletes, patellar tendinopathy is three times more frequent compared with Achilles tendinopathy.

**Conclusions:** Longitudinal studies are necessary to investigate physiological or pathological origin of vascularizations and its predictive value in development of tendinopathy.

© 2014 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.

**KEYWORDS:**

Doppler ultrasound; Prevalence; adolescent athletes; hyperechogenicities; hypoechogenicities; sonography; tendinopathy; vascularization

PMID: 25212527

**KNEE/TOTAL****Varus knee position and patella OA**

Knee Surg Sports Traumatol Arthrosc. 2014 Oct 2.

**Correlation between varus knee malalignment and patellofemoral osteoarthritis.**

Otsuki S<sup>1</sup>, Nakajima M, Okamoto Y, Oda S, Hoshiyama Y, Iida G, Neo M.

**Abstract****PURPOSE:**

To evaluate the relationship between patellofemoral osteoarthritis (OA) and varus OA of the knee with a focus on the location of joint space narrowing.

**METHODS:**

Eighty-five patients scheduled to undergo total knee arthroplasty caused by varus OA were enrolled in this study. The relationship between patellofemoral OA and varus knee malalignment was elucidated. To determine the alignment of the patellofemoral joint in varus knees, patellar tilt, and the tibial tuberosity-trochlear groove (TT-TG) distance were measured, and patellofemoral OA was classified using computed tomography.

**RESULTS:**

The femorotibial angles in patients with stage II-IV patellofemoral OA were significantly larger than those in patients with stage I patellofemoral OA, and the patellar tilt in patients with stage II-IV patellofemoral OA and the TT-TG distance in patients with stage IV patellofemoral OA were significantly larger than those in patients with stage I patellofemoral OA. The TT-TG distance was strongly correlated with patellar tilt ( $R^2 = 0.41$ ,  $P < 0.001$ ). Patellofemoral joint space narrowing was mainly noted at the lateral facet, and it was found on both sides as patellofemoral OA worsened.

**CONCLUSION:**

Varus knee malalignment was induced by patellofemoral OA, especially at the lateral facet. Patellar tilt and the TT-TG distance are considered critical factors for the severity of patellofemoral OA. Understanding the critical factors for patellofemoral OA in varus knees such as the TT-TG distance and patellar will facilitate the prevention of patellofemoral OA using procedures such as high tibial osteotomy and total knee arthroplasty to correct knee malalignment.

**LEVEL OF EVIDENCE:**

Retrospective cohort study, Level III.

PMID: 25274097

**OSTEOARTHRITIS/KNEE****Pain and proprioception**

BMC Musculoskelet Disord. 2014 Sep 27

**Can pain influence the proprioception and the motor behavior in subjects with mild and moderate knee osteoarthritis?**

de Oliveira DC, Barboza SD, da Costa FD, Cabral MP, Silva VM, Dionisio VC<sup>1</sup>.

**Abstract****BACKGROUND:**

Osteoarthritis (OA) is a chronic disease, usually characterized by pain, which is associated with reduced muscle strength, disability and progressive loss of function. However, the pain influence over proprioception and motor behaviour remains unclear. Thus, the purpose of the study was to identify the levels of pain, the proprioceptive acuity and the pattern of muscle recruitment during stair ascent and descent in elderly patients with mild and moderate osteoarthritis (OA) compared to healthy subjects.

**METHODS:**

The study participants included 11 healthy elderly subjects (7 women and 4 men) and 31 elderly patients with knee OA (19 women and 12 men). The functional capacity was assessed by the Western Ontario and McMaster Universities (WOMAC) osteoarthritis index; the pain was evaluated by Wong-Baker faces pain rating scale (WBS) and pressure pain threshold (PPT); the proprioceptive acuity was based on the joint position sense evaluated by electrogoniometer; and the electromyographic (EMG) activity of the major muscles of the lower limb were evaluated during a task of stair ascent and descent of 15 cm. For statistical analysis it was used Statistic for Windows software (StatSoft Inc., version 5.0). Data from the WOMAC index, WBS, the proprioceptive acuity and IEMG (for each muscle in each phase) were analyzed using the Mann-Whitney U test and data from PPT was used Kruskal-Wallis test.

**RESULTS:**

Higher scores were found in the WOMAC index and WBS whereas lower scores were seen in PPT in patients with knee OA compared to healthy subjects. In contrast, there were no significant differences in the proprioceptive acuity and EMG results of most muscles analyzed between the groups.

**CONCLUSION:**

The presence of pain does not influence the proprioception and the motor behavior of the thigh muscles during stair ascent and descent in subjects with mild and moderate knee OA.

PMID: 25262234

**FOOT AND ANKLE****Clubfoot and walking**

J Bone Joint Surg Am. 2014 Oct 1

**Walking age of infants with idiopathic clubfoot treated using the ponseti method.**

Zionts LE<sup>1</sup>, Packer DF<sup>2</sup>, Cooper S<sup>1</sup>, Ebrahimzadeh E<sup>1</sup>, Sangiorgio S<sup>1</sup>.

**Abstract****BACKGROUND:**

The Ponseti method is an established approach to treating idiopathic clubfoot in infants. The method involves a period of cast immobilization and postcorrective bracing that potentially interferes with normal movements of the lower extremities. In the present study, we investigated the age at which infants who had idiopathic clubfoot treated using the Ponseti method achieved independent walking.

**METHODS:**

We prospectively evaluated patients of a single surgeon. Included in the study were all patients with idiopathic clubfoot who were full term at birth, were no more than twelve weeks of age at the start of treatment, had received no prior outside treatment, and were followed for a minimum of twenty-four months.

**RESULTS:**

Ninety-four patients were included. The mean age at which patients began walking independently was  $14.5 \pm 2.6$  months (range, ten to twenty-two months). By eighteen months, 90% of the patients were walking without assistance. Patients with moderate or severe clubfoot deformity began walking earlier than did patients with very severe deformity (a mean of 14.2 months compared with 15.8 months;  $p = 0.03$ ). Patients who experienced a relapse before learning to walk began walking later than those who did not relapse (a mean of 15.9 months compared with 14.2 months;  $p = 0.04$ ). Other patient and treatment-related variables had no significant influence on the onset of walking.

**CONCLUSIONS:**

On the basis of our findings, parents of infants with idiopathic clubfoot treated using the Ponseti method may expect their child to achieve independent walking approximately two months later than infants without clubfoot deformity. A greater delay may be expected for those patients who have a very severe deformity or those who experience a deformity relapse.

**LEVEL OF EVIDENCE:**

Therapeutic Level IV. See Instructions for Authors for a complete description of levels of evidence.

Copyright © 2014 by The Journal of Bone and Joint Surgery, Incorporated.

PMID: 25274792

## **Adolescent flatfoot**

J Am Acad Orthop Surg. 2014 Oct;22

### **Flatfoot Deformity in Children and Adolescents: Surgical Indications and Management.**

Bouchard M, Mosca VS.

#### **Abstract**

Most children with flatfeet are asymptomatic and will never require treatment. In general, flatfoot deformity is flexible and will not cause pain or disability; it is a normal variant of foot shape. Thus, it is essential to reassure and educate patients and parents. A flatfoot with a contracture of the Achilles tendon may be painful. In these cases, a stretching program may help relieve pain. Scant convincing evidence exists to support the use of inserts or shoe modifications for effective relief of symptoms, and there is no evidence that those devices change the shape of the foot. The surgeon must be vigilant to identify the rare rigid flatfoot. Indications for flatfoot surgery are strict: failure of prolonged nonsurgical attempts to relieve pain that interferes with normal activities and occurs under the medial midfoot and/or in the sinus tarsi. In nearly all cases, an associated contracture of the heel cord is present. Osteotomies with supplemental soft-tissue procedures are the best proven approach for management of rigid flatfoot.

Copyright 2014 by the American Academy of Orthopaedic Surgeons.

PMID: 25281257

## MANUAL THERAPY

### Aromatherapy

Pain Manag Nurs. 2014 Jun;15

#### **Effects of aromatherapy massage on face-down posture-related pain after vitrectomy: a randomized controlled trial.**

Adachi N<sup>1</sup>, Munesada M<sup>2</sup>, Yamada N<sup>1</sup>, Suzuki H<sup>1</sup>, Futohashi A<sup>1</sup>, Shigeeda T<sup>3</sup>, Kato S<sup>3</sup>, Nishigaki M<sup>4</sup>.

#### **Abstract**

**Purpose:** Postoperative face-down posturing (FDP) is recommended to optimize the effects of intraocular gas tamponade after vitrectomy. However, patients undergoing FDP usually experience physical and psychological burdens. This 3-armed, randomized, single-center trial investigated the effects of aromatherapy on FDP-related physical pain.

**Methods:** Sixty-three patients under FDP were randomly allocated to one of three treatment groups: aromatherapy massage with essential oil (AT), oil massage without essential oil (OT), and a control group. The AT and OT groups received 10 minutes of massage by ward nurses trained by an aromatherapist, while the control group received usual care. Outcomes were assessed as short-term (pre- to post-intervention) and long-term (first to third postoperative day) changes in physical pain in five body regions using face-scale.

**Results:** The AT and OT groups both revealed similar short-term pain reductions after intervention, compared with the control group. Regarding long-term effects, neither group experienced significant effects until the second day. Significantly more pain reduction compared with usual care occurred on the third day, mainly in the AT group, though there were few significant differences between the AT and OT groups.

**Conclusions:** In conclusion, this study suggests that simple oil massage is an effective strategy for immediate pain reduction in patients undergoing FDP, while aromatherapy may have a long-term effect on pain reduction.

Copyright © 2014 American Society for Pain Management Nursing. Published by Elsevier Inc. All rights reserved.

PMID: 23466193

**Reiki therapy**

Pain Manag Nurs. 2014 Feb 27.

**Effect of Reiki Therapy on Pain and Anxiety in Adults: An In-Depth Literature Review of Randomized Trials with Effect Size Calculations.**

Thrane S<sup>1</sup>, Cohen SM<sup>2</sup>.

**Abstract**

**Purpose:** The objective of this study was to calculate the effect of Reiki therapy for pain and anxiety in randomized clinical trials.

**Methods:** A systematic search of PubMed, ProQuest, Cochrane, PsychInfo, CINAHL, Web of Science, Global Health, and Medline databases was conducted using the search terms pain, anxiety, and Reiki. The Center for Reiki Research also was examined for articles. Studies that used randomization and a control or usual care group, used Reiki therapy in one arm of the study, were published in 2000 or later in peer-reviewed journals in English, and measured pain or anxiety were included. After removing duplicates, 49 articles were examined and 12 articles received full review.

**Results:** Seven studies met the inclusion criteria: four articles studied cancer patients, one examined post-surgical patients, and two analyzed community dwelling older adults. Effect sizes were calculated for all studies using Cohen's d statistic. Effect sizes for within group differences ranged from  $d = 0.24$  for decrease in anxiety in women undergoing breast biopsy to  $d = 2.08$  for decreased pain in community dwelling adults. The between group differences ranged from  $d = 0.32$  for decrease of pain in a Reiki versus rest intervention for cancer patients to  $d = 4.5$  for decrease in pain in community dwelling adults.

**Conclusions:** Although the number of studies is limited, based on the size Cohen's d statistics calculated in this review, there is evidence to suggest that Reiki therapy may be effective for pain and anxiety. Continued research using Reiki therapy with larger sample sizes, consistently randomized groups, and standardized treatment protocols is recommended.

Copyright © 2013 American Society for Pain Management Nursing. Published by Elsevier Inc. All rights reserved.

PMID: 24582620

## EXERCISE

### Patient preference

Clin J Pain. 2014 Nov

#### **Patient beliefs and perceptions about exercise for nonspecific chronic low back pain: a systematic review of qualitative studies.**

Slade SC<sup>1</sup>, Patel S, Underwood M, Keating JL.

#### **Abstract**

##### **OBJECTIVES:**

The global burden of low back pain is the highest ranked condition contributing to years of living with disability. Exercise is moderately effective, and adherence to exercise may improve if participants are engaged. Identification of elements that enhance engagement would enable clinicians to prescribe appropriate interventions. The review objective was to identify and synthesize qualitative empirical studies that have explored beliefs about exercise therapy of people with nonspecific chronic low back pain.

##### **METHODS:**

Two independent reviewers conducted a structured review and metasynthesis informed by Cochrane and Campbell Collaboration guidelines and the PRISMA statement. Fifteen papers were included for data extraction, method quality assessment, and thematic analysis.

##### **RESULTS:**

Four key themes emerged: (1) perceptions and classification of exercise; (2) role and impact of the health professional; (3) exercise and activity enablers/facilitators; (4) exercise and activity barriers. Participants believed that there were distinctions between general activity, real/fitness exercise, and medical exercise. Levels of acquired skills and capability and participant experience with exercise culture require consideration in program design. People participating in exercise classes and group work may be more comfortable when matched for abilities and experience. When an intervention interferes with everyday life and appears to be ineffective or too difficult to implement, people make a reasoned decision to discontinue.

##### **DISCUSSION:**

People are likely to prefer and participate in exercise or training programs and activities that are designed with consideration of their preferences, circumstances, fitness levels, and exercise experiences.

PMID: 24300225

## Peripheral artery disease and exercise

Sports Med. 2014 Sep 18.

### **Exercise Training for Management of Peripheral Arterial Disease: A Systematic Review and Meta-Analysis.**

Parmenter BJ<sup>1</sup>, Dieberg G, Smart NA.

#### **Abstract**

#### **BACKGROUND:**

Peripheral arterial disease (PAD), a chronic condition with debilitating clinical sequelae, leads to reduced walking activity and increased mortality risk.

#### **OBJECTIVE:**

We sought to quantify expected benefits elicited via exercise training in people with PAD and aimed to clarify which prescriptions were optimal.

#### **DATA SOURCES AND STUDY SELECTION:**

We conducted a systematic search (PubMed, CINAHL, Cochrane controlled trials registry; 1966-31 July 2013). We included randomized controlled trials (RCTs) of exercise training versus usual medical care in persons with PAD. Studies were assessed by two reviewers, 41 of 57 (72 %) of RCTs met selection criteria.

#### **MAIN OUTCOMES AND MEASURES:**

Primary outcome: change in aerobic capacity (peak  $\text{VO}_2$ ). Secondary outcomes: ankle-brachial index (ABI), flow-mediated dilatation, 6-minute walk claudication distances (initial and absolute) and graded treadmill (initial and absolute) distances. The primary hypothesis was that peak  $\text{VO}_2$  would increase with exercise training. Using sub-analyses, we also aimed to clarify what types of exercise prescription would provide patients with most benefit; hypotheses were developed a priori.

#### **RESULTS:**

Exercise training produced significant peak  $\text{VO}_2$  improvements with mean difference (MD)  $0.62 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$  (95 % CI 0.47-0.77;  $p < 0.00001$ ); 6-minute walk initial claudication MD 52.7 m (95 % CI 24.7-80.6 m;  $p = 0.0002$ ); total walking distance MD 34.9 m (95 % CI 25.6-44.1 m;  $p < 0.00001$ ); graded treadmill initial claudication MD 68.8 m (95 % CI 54.4-83.2 m;  $p < 0.00001$ ); absolute claudication distance MD 41.0 m (95 % CI 28.8-53.2 m;  $p < 0.00001$ ); but not ABI ( $p = 0.12$ ) or flow mediated dilatation (FMD) ( $p = 0.96$ ). Sub-analyses of change in peak  $\text{VO}_2$  after arm cranking showed a MD of  $1.91 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$  (95 % CI 1.28-2.54,  $p < 0.00001$ ). Sub-analysis of peak  $\text{VO}_2$  according to exercise training pain thresholds suggested that no-to-mild pain may be superior (MD  $0.79 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$  [95 % CI 0.45-1.14,  $p < 0.00001$ ]) to moderate-to-maximum training pain (MD  $0.49 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$  [95 % CI 0.31-0.66,  $p < 0.00001$ ]).

#### **CONCLUSIONS AND RELEVANCE:**

Exercise training improves cardio-respiratory fitness, pain-free and total flat-ground walking distances, as well as graded treadmill performance in PAD. Exercise prescriptions for PAD may consider arm cranking as well as lower limb exercise, possibly at short vigorous intensity intervals, but only to a threshold of mild pain.

PMID: 25230780

**SCOLIOSIS****End-plate****Supine to standing Cobb angle change in idiopathic scoliosis: the effect of endplate pre-selection**

Bethany E Keenan, Maree T Izatt, Geoffrey N Askin, Robert D Labrom, Mark J Pearcy and Clayton J Adam, *Scoliosis* 2014, **Published: 8 October 2014**

**Abstract (provisional)****Background**

Supine imaging modalities provide valuable 3D information on scoliotic anatomy, but the altered spine geometry between the supine and standing positions affects the Cobb angle measurement. Previous studies report a mean 7[degree sign]-10[degree sign] Cobb angle increase from supine to standing, but none have reported the effect of endplate pre-selection or whether other parameters affect this Cobb angle difference.

**Methods**

Cobb angles from existing coronal radiographs were compared to those on existing low-dose CT scans taken within three months of the reference radiograph for a group of females with adolescent idiopathic scoliosis. Reformatted coronal CT images were used to measure supine Cobb angles with and without endplate pre-selection (end-plates selected from the radiographs) by two observers on three separate occasions. Inter and intra-observer measurement variability were assessed. Multi-linear regression was used to investigate whether there was a relationship between supine to standing Cobb angle change and eight variables: patient age, mass, standing Cobb angle, Risser sign, ligament laxity, Lenke type, fulcrum flexibility and time delay between radiograph and CT scan.

**Results**

Fifty-two patients with right thoracic Lenke Type 1 curves and mean age 14.6 years (SD 1.8) were included. The mean Cobb angle on standing radiographs was 51.9[degree sign] (SD 6.7). The mean Cobb angle on supine CT images without pre-selection of endplates was 41.1[degree sign] (SD 6.4). The mean Cobb angle on supine CT images with endplate pre-selection was 40.5[degree sign] (SD 6.6). Pre-selecting vertebral endplates increased the mean Cobb change by 0.6[degree sign] (SD 2.3, range -9[degree sign] to 6[degree sign]). When free to do so, observers chose different levels for the end vertebrae in 39% of cases. Multi-linear regression revealed a statistically significant relationship between supine to standing Cobb change and fulcrum flexibility ( $p = 0.001$ ), age ( $p = 0.027$ ) and standing Cobb angle ( $p < 0.001$ ). The 95% confidence intervals for intra-observer and inter-observer measurement variability were 3.1[degree sign] and 3.6[degree sign], respectively.

**Conclusions**

Pre-selecting vertebral endplates causes minor changes to the mean supine to standing Cobb change. There is a statistically significant relationship between supine to standing Cobb change and fulcrum flexibility such that this difference can be considered a potential alternative measure of spinal flexibility.

**ATHLETICS****Skin temperature**

Med Sci Sports Exerc. 2014 Oct 6.

**Warm Skin Alters Cardiovascular Responses to Cycling after Preheating and Precooling.**

Lee JF<sup>1</sup>, Christmas KM, Machin DR, McLean BD, Coyle EF.

**Abstract****PURPOSE:**

Exercise in hot conditions increases core (TC) and skin temperature (TSK) and can lead to a progressive rise in heart rate (HR) and decline in stroke volume (SV) during prolonged exercise. Thermoregulatory driven elevations in skin blood flow (SkBF) adds complexity to cardiovascular regulation during exercise in these conditions. Presently, the dominant, although debated, view is that raising TSK increases SkBF and reduces SV through diminished venous return; however, this scenario has not been rigorously investigated across core and skin temperatures. We tested the hypothesis that high TSK would raise HR and reduce SV during exercise following precooling (cold water bath) and preheating (hot water bath), and that no relationship would exist between SkBF and SV during exercise.

**METHODS:**

Non-endurance trained individuals cycled for 20 min at  $69 \pm 1\%$   $\dot{V}O_{2peak}$  on four occasions: cool skin-cool core (SkCCC), warm skin-cool core (SkWCC), cool skin-warm core (SkCCW), and warm skin-warm core (SkWCW) on separate days.

**RESULTS:**

After precooling of TC, the rise in HR was greater in SkWCC vs. SkCCC ( $P < 0.001$ ), yet SV was similar ( $P = 0.26$ ), which resulted in higher QC at min 20 in SkWCC ( $P < 0.01$ ). Throughout exercise following preheating of TC, HR was higher ( $P < 0.001$ ), SV was reduced ( $P < 0.01$ ), and QC was similar ( $P = 0.40$ ) in SkWCW vs. SkCCW. When all trials were compared, there was no relationship between SkBF and SV ( $r = -0.08$ ;  $P = 0.70$ ); however, there was an inverse relationship between HR and SV ( $r = -0.75$ ;  $P < 0.001$ ).

**CONCLUSION:**

These data suggest that when TSK is elevated during exercise, HR and TC will rise, but SV will only be reduced when TC is also elevated above  $38^{\circ}\text{C}$ . Furthermore, changes in SV are not related to changes in SkBF.

PMID: 25290741

## RUNNING

### Abstract prepared by Jason Racca

Sports Injury Bulletin: Prevention, Treatment, and Rehabilitation: The Physio's Guide to Running Injuries. **Authors:** Mark Alexander; Scott Smith; Sean Fyfe; Mark Palmer

**Synopses: Aspects of training for running and managing common running injuries.**

#### **Section 1: Born to Run? It's very unlikely:**

This section promotes the Pose Method of running. He discusses 7 types of people that are more prone to injury: large Q-angles, Pregnancy, those with sedentary jobs, position of tibial tuberosity, late starters, old leg injuries, those with physically demanding jobs. He promotes a focus on lumbo-pelvic control and forward lean. He suggests that many injuries related to running are due to a lack of lumbo-pelvic control and that running needs to be trained in order to be efficient.

#### **Section 2: How to prevent hamstring injuries:**

In this section he presents statistics for the incidence of hamstring injuries and discusses factors that contribute to hamstring injuries. Hamstring:Quad (H:Q) ratio, Eccentric:Concentric (E:C), and Side:Side (S:S) are all important ratios that when not ideal can lead to hamstring injury. He also considers a more global approach and considers other structures that contribute to hamstring injuries, such as lack of efficient ankle dorsiflexion, poor hip extensor effort, short hip flexors, poor lumbo-pelvic control, and ineffective hamstrings. He presents a couple of good diagrams summarizing the contributing factors and also presents an algorithm for screening for hamstring injury risk. He does a thorough job of summarizing multiple contributing factors to hamstring injury in athletes.

#### **Section 3: Endurance Runners and Their Troublesome IT Band**

This section is presented as a case study of an ultra-endurance runner with IT band dysfunction. This patient had a history of chronic ankle sprains. The author discusses some of Janda's work showing that gluteus max on previously injured side was inhibited and she was very weak with hip extension exercises. Also, her proprioception was poor. With this case, he focused on proprioceptive exercises early on and then added hip extension strengthening. He also addressed her running technique.

#### **Section 4: How to sort a chronically tight calf muscle**

In this section he considers adverse neural tension of the sural nerve as a contributing factor to calf tightness. Has some basic treatment suggestions.

#### **Section 5: Treating Ankle Sprains**

He discusses a 25-minute cryo-kinetic ice bath regime. Basically it is having your ankle in an ice bath for 25 min with a mix of passive icing, functional exercise (while still in the ice bath.)

#### **Clinical Relevance/FMT relevance:**

The authors do a good job of considering a global and integrated approach and assessment of the body as a whole when dealing with the injuries discussed. The philosophy of the pelvis being the "driver" during running lines up well with BET/CFS, PNF, and PNF gait principles taught in FMT. Fairly comprehensive for a summary with a long list of peer reviewed references. Not all inclusive by any means. Worth the read as a review of running related injuries, not as a reference.

**PAIN****Sleep disturbance and OA**

Arthritis Care Res (Hoboken). 2014 Oct 6.

**Sleep disturbance in Osteoarthritis: Linkages with pain, disability and depressive symptoms.**

Parmelee PA<sup>1</sup>, Tighe CA, Dautovich ND.

**Abstract**

**Objective:** It is known that osteoarthritis (OA) increases risk of sleep disturbance, and that both pain and sleep problems may trigger functional disability and depression. However, studies examining all four variables simultaneously are rare. This research therefore examined cross-sectional and longitudinal associations of self-reported sleep disturbance with OA-related pain and disability, and depressive symptoms.

**Methods:** At baseline, 367 persons with physician-diagnosed knee OA reported sleep disturbances, pain, functional limitations, and depressive symptoms. All measures were repeated a year later (N = 288). Baseline analyses examined the independent and interactive associations of sleep disturbance with pain, disability and depression, net of demographics and general health. Longitudinal analyses used baseline sleep disturbance to predict one-year change in pain, disability and depression.

**Results:** At baseline, sleep was independently associated with pain and depression, but not disability. The sleep-pain relationship was mediated by depressive symptoms; sleep interacted with pain to exacerbate depression among persons with high levels of pain. Baseline sleep disturbance predicted increased depression and disability, but not pain, at follow-up.

**Conclusions:** These data confirm known cross-sectional relationships of sleep disturbance with pain and depression, and provide new insights on longitudinal associations among those variables. Depression appears to play a strong role in the sleep-pain linkage, particularly where pain is severe. The unique predictive role of sleep in progression of disability requires further study, but may be an important point of intervention to prevent OA-related functional decline among persons whose sleep is disrupted by OA pain. © 2014 American College of Rheumatology.

Copyright © 2014 American College of Rheumatology.

PMID: 25283955

## FIBROMYALGIA

### Homeopathy and FM

Complement Ther Med. 2014 Aug;22. Epub 2014 Jun 28.

#### **Homeopathy in the treatment of fibromyalgia--a comprehensive literature-review and meta-analysis.**

Boehm K<sup>1</sup>, Raak C<sup>2</sup>, Cramer H<sup>3</sup>, Lauche R<sup>3</sup>, Ostermann T<sup>4</sup>.

#### **Abstract**

##### **BACKGROUND:**

Coping with the complex nature of fibromyalgia symptoms (FMS) still remains a challenge for patients. Taking into account the possible adverse events of pharmacological treatments patients often seek additional treatments for the management of fibromyalgia and turn towards complementary and alternative medicine (CAM).

##### **OBJECTIVE:**

In this review, we aimed to investigate the current state of literature of homeopathy in the treatment of FMS.

##### **METHODS:**

We searched Medline, the Cochrane Register of Controlled Trials, Embase, AMED, PsycInfo and CAMbase for the terms "fibromyalgia AND homeopath\$" through February 2013. In addition we searched Google Scholar, the library of the Carstens Foundation and that of the Deutsche Homöopathische Union (DHU). Standardized mean differences (SMD) with 95% confidence intervals (CI) were calculated and meta-analyzed using the generic inverse variance method.

##### **RESULTS:**

We found 10 case-reports, 3 observational studies, 1 non-randomized and 4 randomized controlled trials (RCTs) on homeopathy for fibromyalgia. Both case reports and observational studies are naturally predominated by the use of qualitative and not validated outcome measures. Meta-analyses of CCTs revealed effects of homeopathy on tender point count (SMD=-0.42; 95%CI -0.78, -0.05; P=0.03), pain intensity (SMD=-0.54; 95%CI -0.97, -0.10; P=0.02), and fatigue (SMD=-0.47; 95%CI -0.90, -0.05; P=0.03) compared to placebo.

##### **CONCLUSION:**

The results of the studies as well as the case reports define a sufficient basis for discussing the possible benefits of homeopathy for patients suffering from fibromyalgia syndrome although any conclusions based on the results of this review have to be regarded as preliminary.

Copyright © 2014 Elsevier Ltd. All rights reserved.

##### **KEYWORDS:**

Fibromyalgia; Homeopathy; Meta-analysis; Review

PMID: 25146079

## Hypervigilance and FM

Eur J Pain. 2014 Sep 23. doi: 10.1002/ejp.593. [Epub ahead of print]

### **Hypervigilance for innocuous tactile stimuli in patients with fibromyalgia: An experimental approach.**

Van Damme S<sup>1</sup>, Van Hulle L, Spence C, Devulder J, Brusselmans G, Crombez G.

#### **Abstract**

##### **BACKGROUND:**

Hypervigilance, i.e., excessive attention, is often invoked as a potential explanation for the observation that many individuals with fibromyalgia show a heightened sensitivity to stimulation in various sensory modalities, such as touch and hearing. Compelling evidence for this assumption is, however, lacking. The aim of the present study was to investigate the presence of somatosensory hypervigilance in patients with fibromyalgia.

##### **METHODS:**

Fibromyalgia patients (n = 41) and a matched control group (n = 40) performed a tactile change detection task in which they had to detect whether there was a change between two consecutively presented patterns of tactile stimuli presented to various body locations. The task was performed under two conditions: in the unpredictable condition, tactile changes occurred equally often at all possible body locations; in the predictable condition, the majority of tactile changes occurred at one specific body location.

##### **RESULTS:**

It was hypothesized that the fibromyalgia group would show better tactile change detection in the unpredictable condition and when changes occurred at unexpected locations in the predictable condition. The results did not support this hypothesis. In neither condition was the fibromyalgia group better than the control group in detecting tactile changes.

##### **CONCLUSIONS:**

No evidence was found to support the claim that patients with fibromyalgia display somatosensory hypervigilance. This finding challenges the idea of hypervigilance as a static feature of fibromyalgia and urges for a more dynamic view in which hypervigilance emerges in situations when bodily threat is experienced.

© 2014 European Pain Federation - EFIC®

PMID: 25252089

## FM and central sensitization

Pain Manag Nurs. 2014 Jun;15. Epub 2012 Sep 24.

### Neural and psychosocial mechanisms of pain sensitivity in fibromyalgia.

English B.

#### Abstract

**Purpose:** Fibromyalgia is a chronic musculoskeletal pain disorder that affects an estimated 5 million adults in the U.S. The hallmark is burning, searing, tingling, shooting, stabbing, deep aching, or sharp pain. Fibromyalgia is generally considered to be a "central sensitivity syndrome" where central sensitization is regarded as the cause of pain in its own right. Nonetheless, the case continues to be made that all central and spatially distributed peripheral components of fibromyalgia pain would fade if the peripheral generators could be silenced. Although neural mechanisms are clearly important in pain sensitivity, cognitive and social mechanisms also need to be considered.

**Method:** The aim of this review is to examine four mechanisms responsible for heightened pain sensitivity in fibromyalgia: peripheral sensitization, central sensitization, cognitive-emotional sensitization, and interpersonal sensitization. The purpose of framing the review in terms of pain sensitivity in fibromyalgia is to highlight that different mechanisms of sensitization are appropriately regarded as intervening variables when it comes to understanding individual differences in the experience of pain.

**Result:** The paper concludes by considering the implications of the findings of the review for explanations of fibromyalgia pain by nurses working in multidisciplinary teams. The trend appears to be able to explain the cause of fibromyalgia pain in terms of sensitization per se.

**Conclusion:** The recommended alternative is to explain fibromyalgia pain in terms of changes in pain sensitivity and the role of underlying neural and psychosocial mechanisms.

Copyright © 2014 American Society for Pain Management Nursing. Published by Elsevier Inc. All rights reserved.

PMID: 24882030

## NUTRITION/VITAMINS

### Coenzyme Q10

iofactors. 2003;18(1-4):79-89.

#### **Overview on coenzyme Q10 as adjunctive therapy in chronic heart failure. Rationale, design and end-points of "Q-symbio"--a multinational trial.**

Mortensen SA.

#### **Abstract**

**Purpose:** Energy starvation of the myocardium is probably a dominant feature of heart failure and attention has been directed towards agents which may stabilize myocardial metabolism and maintain adequate energy stores.

**Method:** A reduced myocardial tissue content of the essential redox-component and natural antioxidant Coenzyme Q10 (CoQ10) has been detected in patients with heart failure and the observed level of CoQ10 deficiency was correlated to the severity of heart failure. CoQ10 fulfills various criteria of an obvious adjunct in patients with symptomatic heart failure: it is devoid of significant side effects and it improves symptoms and quality of life. Till this date, several double-blind placebo-controlled trials with CoQ10 supplementation in more than 1000 patients have been positive and statistically significant with respect to various clinical parameters, e.g. improvement in NYHA Class, exercise capacity and reduced hospitalisation frequency. Also treatment with CoQ10 led to a significant improvement of relevant hemodynamic parameters. In only 3 out of 13 double-blind studies comprising 10% of the total number of patients treated the results were neutral.

**Result:** Thus, based on the available controlled data CoQ10 is a promising, effective and safe approach in chronic heart failure. This is why a double-blind multicenter trial with focus on morbidity and mortality has been planned to start in 2003: Q-SYMBIO. Patients in NYHA classes III to IV (N=550) receiving standard therapy are being randomized to treatment with CoQ10 100 mg t.i.d. or placebo in parallel groups. End-points in a short-term evaluation phase of 3 months include symptoms, functional capacity and biomarker status (BNP). The aim of a subsequent 2-year follow-up study is to test the hypothesis that CoQ10 may reduce cardiovascular morbidity (unplanned cardiovascular hospitalisation due to worsening heart failure) and mortality as a composite endpoint.

**Conclusion:** This trial should help to establish the future role of CoQ10 as part of a maintenance therapy in patients with chronic heart failure.

PMID: 14695923

**Nutrition and hip fracture**

J Bone Miner Res. 2014 Oct 7

**Fruit and vegetable intake and risk of hip fracture: A cohort study of Swedish men and women.**

Byberg L<sup>1</sup>, Bellavia A, Orsini N, Wolk A, Michaëlsson K.

**Abstract**

**Purpose:** Dietary guidelines recommend a daily intake of five servings of fruit and vegetables. Whether such intakes are associated with a lower risk of hip fracture is at present unclear. The aim of the present study was to investigate the dose-response association between habitual fruit and vegetable intake and hip fracture in a cohort study based on 40,644 men from the Cohort of Swedish Men (COSM) and 34,947 women from the Swedish Mammography Cohort (SMC) (total n=75,591), free from cardiovascular disease and cancer, who answered lifestyle questionnaires in 1997 (age 45-83 years).

**Methods:** Intake of fruit and vegetables (servings/day) was assessed by food frequency questionnaire and incident hip fractures were retrieved from the Swedish Patient Register (1998-2010). The mean follow-up time was 14.2 years.

**Results:** One third of the participants reported an intake of fruit and vegetables of >5 servings/day, one third >3 to ≤5 servings/day, 28% >1 to ≤3 servings/day, and 6% reported ≤1 serving/day. During 1,037,645 person-years we observed 3,644 hip fractures (2,266, 62%, in women). The dose-response association was found to be strongly non-linear (P<0.001). Men and women with zero consumption had 88% higher rate of hip fracture compared with those consuming 5 servings/day; adjusted hazard ratio (HR), 1.88 (95% CI, 1.53-2.32). The rate was gradually lower with higher intakes; adjusted HR for 1 vs 5 servings/day, 1.35 (95% CI, 1.21-1.58). However, more than 5 servings/day did not confer additionally lower HRs (adjusted HR for 8 vs. 5 servings/day, 0.96 (95% CI, 0.90-1.03). Similar results were observed when men and women were analyzed separately.

**Conclusion:** We conclude that there is a dose-response association between fruit and vegetable intake and hip fracture such that an intake below the recommended 5 servings/day confers higher rates of hip fracture. Intakes above this recommendation do not seem to further lower the risk. © 2014 American Society for Bone and Mineral Research.

© 2014 American Society for Bone and Mineral Research.

**KEYWORDS:**

Epidemiology; fruit and vegetables; hip fracture; nutrition; osteoporosis

PMID: 25294687

**Theramine and inflammation**

Am J Ther. 2014 Sep 18.

**Reduction in Pain and Inflammation Associated With Chronic Low Back Pain With the Use of the Medical Food Theramine.**

Shell WE<sup>1</sup>, Pavlik S, Roth B, Silver M, Breitstein ML, May L, Silver D.

**Abstract**

**Purpose:** Management of chronic back pain is a challenge for physicians. Although standard treatments exert a modest effect, they are associated with narcotic addiction and serious side effects from nonsteroidal antiinflammatory agents. Moreover, neurotransmitter depletion from both the pain syndrome and therapy may contribute to a poor treatment outcome.

Neurotransmitter deficiency may be related both to increased turnover rate and inadequate neurotransmitter precursors from the diet, particularly for essential and semi-essential amino acids. Theramine, an amino acid blend 68405-1 (AAB), is a physician-prescribed only medical food. It contains neurotransmitter precursors and systems for increasing production and preventing attenuation of neurotransmitters.

**Methods:** A double-blind controlled study of AAB, low-dose ibuprofen, and the coadministration of the 2 agents were performed. The primary end points included the Roland Morris index and Oswestry disability scale. The cohort included 122 patients aged between 18 and 75 years. The patients were randomized to 1 of 3 groups: AAB alone, ibuprofen alone, and the coadministration of the 2 agents. In addition, C-reactive protein, interleukin 6, and plasma amino acid concentrations were measured at baseline and 28 days time points.

**Results:** After treatment, the Oswestry Disability Index worsened by 4.52% in the ibuprofen group, improved 41.91% in the AAB group, and improved 62.15% in the combination group. The Roland Morris Index worsened by 0.73% in the ibuprofen group, improved by 50.3% in the AAB group, and improved 63.1% in the combination group. C-reactive protein in the ibuprofen group increased by 60.1%, decreased by 47.1% in the AAB group, and decreased by 36% in the combination group. Similar changes were seen in interleukin 6. Arginine, serine, histidine, and tryptophan levels were substantially reduced before treatment in the chronic pain syndrome and increased toward normal during treatment. There was a direct correlation between improvement in amino acid concentration and treatment response.

**Conclusion:** Treatment with amino acid precursors was associated with substantial improvement in chronic back pain, reduction in inflammation, and improvement in back pain correlated with increased amino acid precursors to neurotransmitters in blood.

PMID: 25237981

**Vit D**

Int J Rheum Dis. 2014 Oct 7

**Vitamin D status in rheumatoid arthritis patients: relation to clinical manifestations, disease activity, quality of life and fibromyalgia syndrome.**

Gheita TA<sup>1</sup>, Sayed S, Gheita HA, Kenawy SA.

**Abstract****AIM:**

To assess vitamin D levels in rheumatoid arthritis (RA) patients and to find their relation to clinical parameters, fibromyalgia syndrome (FMS), quality of life (QoL) and disease activity.

**METHODS:**

The study included 63 RA patients and 62 controls. Clinical examination and laboratory investigations were performed. For patients, the Disease Activity Score (DAS-28), QoL index, Health Assessment Questionnaire II (HAQ II) and Modified Larsen score were calculated. 25-OH-vitamin D was measured in patients and controls.

**RESULTS:**

The patients' mean age was  $41.59 \pm 9.69$  years and disease duration  $5.89 \pm 3.67$  years. The level of vitamin D in RA patients was significantly lower ( $23.11 \pm 12.71$  ng/mL) than that in the controls ( $32.59 \pm 13.06$  ng/mL) ( $P = 0.005$ ) being deficient in 50.8%, insufficient in 23.8% and normal in 25.4%. The RA patients with FMS ( $n = 33$ ) had significantly lower levels of vitamin D ( $19.08 \pm 10.59$  ng/mL) than those without ( $27.55 \pm 13.51$  ng/mL) ( $P = 0.008$ ). The difference was significant on comparing those receiving hydroxychloroquine ( $17.39 \pm 7.84$  ng/mL) to those not ( $31.85 \pm 13.85$  ng/mL) ( $P < 0.001$ ). Vitamin D significantly correlated with QoL index ( $r = 0.58$ ,  $P < 0.001$ ) and negatively with HAQ II ( $r = -0.36$ ,  $P = 0.004$ ) and BMI ( $r = -0.39$ ,  $P = 0.001$ ).

**CONCLUSION:**

Special attention is required regarding vitamin D levels in RA patients with FMS and decreased QoL. Vitamin D should be corrected and supplementation considered among the RA management armamentarium.

© 2014 Asia Pacific League of Associations for Rheumatology and Wiley Publishing Asia Pty Ltd.

**KEYWORDS:**

HAQ II; QoL; disease activity (DAS-28); fibromyalgia syndrome; rheumatoid arthritis; vitamin D

PMID: 25291242

## Glucosamine

Clin Rheumatol. 2014 Aug 3.

**Combined glucosamine and chondroitin sulfate, once or three times daily, provides clinically relevant analgesia in knee osteoarthritis.**

Provenza JR<sup>1</sup>, Shinjo SK, Silva JM, Peron CR, Rocha FA.

### Abstract

**Purpose:** We compared the analgesic efficacy and safety of glucosamine sulfate (GS) and chondroitin sulfate (CS) capsules or sachet preparations with glucosamine hydrochloride (GH) and CS capsules in knee osteoarthritis (OA) patients.

**Methods:** 1,120 subjects with radiographic knee OA (Kellgren/Lawrence 2-3) were randomized (1:1:1) at 16 centers to receive GS 500 mg/CS 400 mg three times daily capsules (GI) or once daily sachet (GII) or GH 500 mg/CS 400 mg three times daily (GIII) for a 16-week trial. Primary outcome, intention-to-treat (ITT) was change from baseline of patient reported pain intensity (0-100 mm visual analogue scale) in the affected knee and variation of Lequesne's index (LI). Monthly secondary outcomes were changes from baseline in patient reported pain and LI, patient and physician global assessments of disease activity, acetaminophen consumption, and adherence. ITT population comprised 302, 301, and 306 patients in GI, GII, and GIII.

**Results:** Pain significantly decreased (GI =  $-30.9 \pm 1.5$ ; GII =  $-28.7 \pm 1.5$ ; GIII =  $-29.7 \pm 1.5$  mm) in all groups ( $P < 0.001$ ) as well as LI (GI =  $-3.8 \pm 0.2$ ; GII =  $-3.7 \pm 0.2$ ; GIII =  $-3.9 \pm 0.2$ ;  $P < 0.001$ ). All secondary outcomes improved ( $P < 0.005$ ) for all groups. Patients that did not complete the study were 77 (44.8 %) for lack of adherence, 16 (9.3 %) consent withdrawal, 11 (6.4 %) adverse events, eight (4.7 %) lost to follow-up, and 17 (9.9 %) for other causes. Non-inferiority analysis found no differences among groups.

**Conclusions:** This is a large study showing that GS/CS and GH/CS provide clinically meaningful and sustained analgesia in knee OA regardless of dose fractionation and capsule or sachet formulations.

PMID: 25085275

**PHARMACOLOGY****Youth antibiotic use and obesity**

Int J Obes (Lond). 2013 Jan. Epub 2012 Aug 21.

**Infant antibiotic exposures and early-life body mass.**

Trasande L<sup>1</sup>, Blustein J, Liu M, Corwin E, Cox LM, Blaser MJ.

**Abstract****OBJECTIVES:**

To examine the associations of antibiotic exposures during the first 2 years of life and the development of body mass over the first 7 years of life.

**DESIGN:**

Longitudinal birth cohort study.

**SUBJECTS:**

A total of 11 532 children born at  $\geq$  2500 g in the Avon Longitudinal Study of Parents and Children (ALSPAC), a population-based study of children born in Avon, UK in 1991-1992.

**MEASUREMENTS:**

Exposures to antibiotics during three different early-life time windows (<6 months, 6-14 months, 15-23 months), and indices of body mass at five time points (6 weeks, 10 months, 20 months, 38 months and 7 years).

**RESULTS:**

Antibiotic exposure during the earliest time window (<6 months) was consistently associated with increased body mass (+0.105 and +0.083 s.d. unit, increase in weight-for-length Z-scores at 10 and 20 months,  $P<0.001$  and  $P=0.001$ , respectively; body mass index (BMI) Z-score at 38 months +0.067 s.d. units,  $P=0.009$ ; overweight OR 1.22 at 38 months,  $P=0.029$ ) in multivariable, mixed-effect models controlling for known social and behavioral obesity risk factors. Exposure from 6 to 14 months showed no association with body mass, while exposure from 15 to 23 months was significantly associated with increased BMI Z-score at 7 years (+0.049 s.d. units,  $P=0.050$ ). Exposures to non-antibiotic medications were not associated with body mass.

**CONCLUSIONS:**

Exposure to antibiotics during the first 6 months of life is associated with consistent increases in body mass from 10 to 38 months. Exposures later in infancy (6-14 months, 15-23 months) are not consistently associated with increased body mass. Although effects of early exposures are modest at the individual level, they could have substantial consequences for population health. Given the prevalence of antibiotic exposures in infants, and in light of the growing concerns about childhood obesity, further studies are needed to isolate effects and define life-course implications for body mass and cardiovascular risks

**Cox 2 inhibitors**

PLoS One. 2014 Jun 2; eCollection 2014.

**COX-2 protects against atherosclerosis independently of local vascular prostacyclin: identification of COX-2 associated pathways implicate Rgl1 and lymphocyte networks.**

Kirkby NS<sup>1</sup>, Lundberg MH<sup>1</sup>, Wright WR<sup>2</sup>, Warner TD<sup>3</sup>, Paul-Clark MJ<sup>2</sup>, Mitchell JA<sup>2</sup>.

**Abstract**

**Purpose:** Cyclo-oxygenase (COX)-2 inhibitors, including traditional nonsteroidal anti-inflammatory drugs (NSAIDs) are associated with increased cardiovascular side effects, including myocardial infarction. We and others have shown that COX-1 and not COX-2 drives vascular prostacyclin in the healthy cardiovascular system, re-opening the question of how COX-2 might regulate cardiovascular health. In diseased, atherosclerotic vessels, the relative contribution of COX-2 to prostacyclin formation is not clear.

**Methods:** Here we have used apoE(-)/COX-2(-) mice to show that, whilst COX-2 profoundly limits atherosclerosis, this protection is independent of local prostacyclin release. These data further illustrate the need to look for new explanations, targets and pathways to define the COX/NSAID/cardiovascular risk axis.

**Results:** Gene expression profiles in tissues from apoE(-)/COX-2(-) mice showed increased lymphocyte pathways that were validated by showing increased T-lymphocytes in plaques and elevated plasma Th1-type cytokines. In addition, we identified a novel target gene, *rgl1*, whose expression was strongly reduced by COX-2 deletion across all examined tissues.

**Conclusion:** This study is the first to demonstrate that COX-2 protects vessels against atherosclerotic lesions independently of local vascular prostacyclin and uses systems biology approaches to identify new mechanisms relevant to development of next generation NSAIDs

## **Pain medication and GI bleeding**

### **Common painkillers + other drugs = high risk of GI bleeding**

#### **American Gastroenterological Association News, 10/06/2014**

**Background and Purpose:** Nonsteroidal anti-inflammatory drugs (NSAIDs) – such as ibuprofen and aspirin – increase one’s risk of upper gastrointestinal bleeding. When taken in combination with other drugs, this risk is significantly higher, according to new research appearing in the October issue of *Gastroenterology*. “These findings may help clinicians tailor therapy to minimize upper gastrointestinal bleeding, and are especially valuable in elderly patients who are likely to use multiple drugs at the same time,” said Gwen Masclee, MD, lead study author from Erasmus Medical Center in Rotterdam, the Netherlands.

**Results:** This study identified that:

- Single therapy with non-selective NSAIDs (the commonly found NSAIDs, which contain both COX-1 and COX-2 enzymes) is more likely to cause upper GI bleeding than single therapy with COX-2 inhibitors or low-dose aspirin.
- Combination therapy significantly increases the risk for internal bleeding, with simultaneous use of non-selective NSAIDs and steroid therapies increasing the risk to the greatest extent.
- The risk of upper GI bleeding is always higher for drug combinations with non-selective NSAIDs than that for low-dose aspirin or COX-2 inhibitors.
- Simultaneous use of non-selective NSAIDs or low-dose aspirin, but not COX-2 inhibitors, with corticosteroids, aldosterone antagonists (diuretic drugs) or anticoagulants (which prevent the blood from clotting) produces significant excess risk of upper GI bleeding.

**Conclusions:** When NSAIDs are necessary, they should be used at the lowest effective dose for the shortest possible duration.