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## 1. LUMBAR SPINE

### Stenosis of lumbar spine increase cervical cord compression

Eur Spine J. 2015 Jun 3.

#### Does lumbar spinal stenosis increase the risk of spondylotic cervical spinal cord compression?

Adamova B<sup>1</sup>, Bednarik J, Andrasinova T, Kovalova I, Kopacik R, Jabornik M, Kerkovsky M, Jakubcova B, Jarkovsky J.

Author information

Abstract

#### **PURPOSE:**

The aim of this prospective cross-sectional observational comparative study was to determine the prevalence of spondylotic cervical cord compression (SCCC) and symptomatic cervical spondylotic myelopathy (CSM) in patients with symptomatic lumbar spinal stenosis (LSS) in comparison with a general population sample and to seek to identify predictors for the development of CSM.

#### **METHODS:**

A group of 78 patients with LSS (48 men, median age 66 years) was compared with a randomly selected age- and sex-matched group of 78 volunteers (38 men, median age 66 years). We evaluated magnetic resonance imaging findings from the cervical spine and neurological examination.

#### **RESULTS:**

The presence of SCCC was demonstrated in 84.6 % of patients with LSS, but also in 57.7 % of a sample of volunteers randomly recruited from the general population. Clinically symptomatic CSM was found in 16.7 % of LSS patients in comparison with 1.3 % of volunteers ( $p = 0.001$ ). Multivariable logistic regression proposed the Oswestry Disability Index of 43 % or more as the only independent predictor of symptomatic CSM in LSS patients (OR 9.41,  $p = 0.008$ ).

#### **CONCLUSIONS:**

The presence of symptomatic LSS increases the risk of SCCC; the prevalence of SCCC is higher in patients with symptomatic LSS in comparison with the general population, with an evident predominance of more serious types of MRI-detected compression and a clinically symptomatic form (CSM). Symptomatic CSM is more likely in LSS patients with higher disability as assessed by the Oswestry Disability Index.

PMID: 26038157

## 2. LBP

### Slump sitting test for Neuropathic pain

#### Diagnostic Accuracy of the Slump Test for Identifying Neuropathic Pain in the Lower Limb

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, Ahead of Print **Pages:** 1-28 doi:10.2519/jospt.2015.5414

**Study Design** Diagnostic accuracy study with non-consecutive enrollment.

**Objectives** Assess diagnostic accuracy of the slump test for neuropathic pain (NeP) in those with low to moderate levels of chronic low back pain (LBP). Determine whether accuracy of the slump test improves by adding anatomical or qualitative pain descriptors.

**Background** NeP has been linked with poor outcomes likely due to inadequate diagnosis which precludes treatment specific for NeP. Current diagnostic approaches are time consuming or lack accuracy.

**Methods** A convenience sample of 21 individuals with LBP with or without radiating leg pain was recruited. A standardized neurosensory examination was used to determine the reference diagnosis for NeP. Afterwards, the slump test was administered to all participants. Reports of pain location and quality produced during the slump test were recorded.

**Results** The neurosensory examination designated 11 of the 21 participants with LBP/sciatica as having NeP. The slump test displayed high sensitivity (0.91), moderate specificity (0.70), a positive likelihood ratio of 3.03, and a negative likelihood ratio of 0.13. Adding the criterion of pain below the knee significantly increased specificity to 1.00 (positive likelihood ratio = 11.9). Pain quality descriptors did not improve diagnostic accuracy.

**Conclusion** The slump test was highly sensitive in identifying NeP within the study sample. Adding a pain location criterion improved specificity. Combining the diagnostic outcomes was very effective in identifying all those without NeP and half of those with NeP. Limitations arising from the small and narrow spectrum of participants with LBP/sciatica sampled within the study prevent application of the findings to a wider population.

**Level of Evidence** Diagnosis, level 3b. *J Orthop Sports Phys Ther*, Epub 24 Jun 2015. doi:10.2519/jospt.2015.5414 **Keyword:** neurodynamic testing, sensitivity, specificity

Read More: [http://www.jospt.org/doi/abs/10.2519/jospt.2015.5414#.VY\\_zx2RVhHw](http://www.jospt.org/doi/abs/10.2519/jospt.2015.5414#.VY_zx2RVhHw)

### Movement based subgroups

#### **Movement-based subgrouping in low back pain: synergy and divergence in approaches**

N.V. Karayannis G.A. Jull P.W. Hodges

Publication stage: In Press Accepted Manuscript  
DOI: <http://dx.doi.org/10.1016/j.physio.2015.04.005>

Physiotherapy, 06/24/2015

#### Abstract

##### Background

Classification systems for low back pain (LBP) aim to guide treatment decisions. In physiotherapy, there are five classification schemes for LBP which consider responses to clinical movement examination. Little is known of the relationship between the schemes.

##### Objectives

To investigate overlap between subgroups of patients with LBP when classified using different movement-based classification schemes, and to consider how participants classified according to one scheme would be classified by another.

##### Design

Cross-sectional cohort study.

##### Setting

University clinical laboratory.

Participants: One hundred and two participants with LBP were recruited from university, hospital outpatient and private physiotherapy clinics, and community advertisements.

##### Intervention

Participants underwent a standardised examination including questions and movement tests to guide subgrouping.

Main outcome measures: Participants were allocated to a LBP subgroup using each of the five classification schemes: Mechanical Diagnosis and Treatment (MDT), Movement System Impairment (MSI), O'Sullivan Classification (OSC), Pathoanatomic Based Classification (PBC) and Treatment Based Classification (TBC).

### Results

There was concordance in allocation to subgroups that consider pain relief from direction-specific repeated spinal loading in the MDT, PBC and TBC schemes. There was consistency of subgrouping between the MSI and OSC schemes, which consider pain provocation to specific movement directions. Synergies between other subgroups were more variable. Participants from one subgroup could be subdivided using another scheme.

### Conclusions

There is overlap and discordance between LBP subgrouping schemes that consider movement. Where overlap is present, schemes recommend different treatment options. Where subgroups from one scheme can be subdivided using another scheme, there is potential to further guide treatment. An integrated assessment model may refine treatment targeting.

Keywords:

Low back pain, Physiotherapy, Classification

### Fear of movement and yoga

#### Yoga Attitudes in Chronic Low Back Pain: Roles of Catastrophizing and Fear of Movement

Martha A. Combs Beverly E. Thorn

Complementary Therapies in Clinical Practice , 06/24/2015 Combs MA, et al.

DOI: <http://dx.doi.org/10.1016/j.ctcp.2015.06.006>

#### Abstract

Chronic low back pain is a significant public health problem and, although underused, yoga may be an effective complementary treatment. The current study examined associations of pain catastrophizing and fear of movement with attitudes toward yoga in adults with chronic low back pain. Participants completed three quantitative questionnaires assessing specific constructs: beliefs about yoga, fear of movement, and pain catastrophizing. A semi-structured in-person interview was then conducted to obtain specific pain-related information. Hierarchical regression and mediational analyses were used to test hypotheses. Consistent with the fear-avoidance model of chronic pain, catastrophizing and fear of movement were negatively associated with yoga attitudes.

Specifically, fear of movement was a mediator between catastrophizing and attitudes toward yoga. Individuals with higher levels of catastrophizing and fear of movement may be less likely to consider a pain treatment involving physical movement.

Keywords:

chronic low back pain, catastrophizing, fear of movement, yoga, fear-avoidance model

## 7. PELVIC ORGANS

### Sperm meets egg

#### **Sperm meets egg: Mystery event may play key role in fertilization**

**Jun 23, 2015**

John Herr, PhD

Groundbreaking new reproductive research from the [School of Medicine](#) has identified key molecular events that could be playing a critical role as sperm and egg fuse to create new life. The findings might one day lead to the creation of a male contraceptive.

The discovery by members of John Herr's lab (UVA's Center for Research in Contraceptive and Reproductive Health) has been featured on the cover of the scientific journal *Biology of Reproduction*. "This report expands our fundamental understanding of the molecular architecture at the site of sperm-egg fusion," Herr said. "Understanding at the molecular level exactly how the sperm is able to bind with and enter the egg opens opportunities to identify molecules that can disrupt or block the fertilization event."

#### Curious conservation

When the sperm first arrives at the egg, the sperm contains enzymes to help it penetrate the egg and fuse with its target. The release of these enzymes is known as the acrosomal reaction. The head of the sperm is completely transformed by this reaction, and tremendous changes begin to take place. But despite this massive remodeling, something intriguing happens, Herr's new research found: A particular protein from within the sperm stays intact at the site of fusion. This protein – discovered by Herr's lab 15 years ago – remains in place although many other proteins are lost.

The evidence indicates that the protein, ESP1, is stabilizing the area where the sperm-egg fusion is occurring. That ESP1 is conserved in the region of the sperm head that is thought to initiate fusion with the egg during this transformative time after the acrosome reaction suggests ESP1 is

playing a key structural role. "We suspect ESP1 is one of the key molecules that helps to stabilize the equatorial segment region of the sperm head," Herr said.

"Getting at the molecular components of the fertilization event has a lot of practical applications – as well as intellectual value – because you want to account for all the major components involved in the essential events of the fertilization cascade," explained Herr, a PhD in the Department of Cell Biology. "You want to know which molecules are located precisely where, and when, as the sperm head becomes remodeled prior to fertilization. Just getting all the molecules defined and dissected and located in their correct subcellular positions is a major challenge, and this report adds to that fund of knowledge."

### Sperm formation

The research also sheds light on the formation of sperm, and Herr's findings again speak to the importance of the ESP1 protein. Herr's research indicates that the creation of the equatorial segment domain of the sperm head is a priority during sperm production. "One of the things that is so interesting about this protein is that as the acrosome forms, the equatorial segment appears to be specified very early in the formation of this organelle," he said.

With all the clues pointing to the protein as a structural component of the region of the sperm head that engages with the egg membrane, the research team must now try to figure out just what is happening with the sugar molecules they have found to associate with the ESP1 protein. One idea is that the sugar molecules are being stripped away before the equatorial segment region condenses. "The fundamental questions are, why does the equatorial segment stay intact after the acrosomal reaction? What molecular interactions contribute to its stability?"

By answering those questions, Herr could one day find a way to block the protein's interactions and – possibly – prevent pregnancy. "We don't know enough yet about the protein-protein interactions here to be able to come up with a defined male contraceptive strategy so it's pretty early in the process of seeing where a small molecule drug might interdict these interactions," he said. "We need to figure out the other partner proteins with which ESP1 is interacting."

Herr's previous research already has led to the creation of SpermCheck, a home fertility test for men that can be found in stores nationwide.

### Findings published

The [article](#) in *Biology of Reproduction* was authored by Viswanadhapalli Suryavathi, Subbarayalu Panneerdoss, Michael J. Wolkowicz, Jagathpala Shetty, Nicholas E. Sherman, Charles J. Flickinger and Herr.

## 8. VISCERA

### Yoga and pregnancy

#### **A randomized controlled trial of yoga for pregnant women with symptoms of depression or anxiety**

Complementary Therapies in Clinical Practice , 06/23/2015 Davis K, et al.

Prenatal yoga was found to be a feasible and acceptable intervention and was associated with reductions in symptoms of anxiety and/or depression; however, prenatal yoga only significantly outperformed TAU on reduction of negative affect.

#### **Methods**

Authors randomly assigned 46 pregnant women with symptoms of depression and/or anxiety to an 8-week yoga intervention or treatment-as-usual (TAU) in order to examine feasibility and preliminary outcomes.

#### **Results**

Yoga was associated with high levels of credibility and satisfaction as an intervention for depression and anxiety during pregnancy.

Participants in both conditions reported significant improvement in symptoms of depression and anxiety over time; and yoga was associated with significantly greater reduction in negative affect as compared to TAU ( $\beta = -0.53$ ,  $SE = 0.20$ ,  $p = .011$ ).

Impact of hormone therapy

PLoS Med. 2015 Jun 2;12(6):e1001833. doi: 10.1371/journal.pmed.1001833. eCollection 2015.

**Effects of Hormone Therapy on Cognition and Mood in Recently Postmenopausal Women: Findings from the Randomized, Controlled KEEPS-Cognitive and Affective Study.**

Gleason CE<sup>1</sup>, Dowling NM<sup>2</sup>, Wharton W<sup>3</sup>, Manson JE<sup>4</sup>, Miller VM<sup>5</sup>, Atwood CS<sup>1</sup>,

## Abstract

**BACKGROUND:** Menopausal hormone therapy (MHT) reportedly increases the risk of cognitive decline in women over age 65 y. It is unknown whether similar risks exist for recently postmenopausal women, and whether MHT affects mood in younger women. The ancillary Cognitive and Affective Study (KEEPS-Cog) of the Kronos Early Estrogen Prevention Study (KEEPS) examined the effects of up to 4 y of MHT on cognition and mood in recently postmenopausal women.

**METHODS AND FINDINGS:** KEEPS, a randomized, double-blinded, placebo-controlled clinical trial, was conducted at nine US academic centers. Of the 727 women enrolled in KEEPS, 693 (95.3%) participated in the ancillary KEEPS-Cog, with 220 women randomized to receive 4 y of 0.45 mg/d oral conjugated equine estrogens (o-CEE) plus 200 mg/d micronized progesterone (m-P) for the first 12 d of each month, 211 women randomized to receive 50 µg/d transdermal estradiol (t-E2) plus 200 mg/d m-P for the first 12 d of each month, and 262 women randomized to receive placebo pills and patches. Primary outcomes included the Modified Mini-Mental State examination; four cognitive factors: verbal learning/memory, auditory attention/working memory, visual attention/executive function, and speeded language/mental flexibility; and a mood measure, the Profile of Mood States (POMS). MHT effects were analyzed using linear mixed-effects (LME) models, which make full use of all available data from each participant, including those with missing data. Data from those with and without full data were compared to assess for potential biases resulting from missing observations. For statistically significant results, we calculated effect sizes (ESs) to evaluate the magnitude of changes. On average, participants were 52.6 y old, and 1.4 y past their last menstrual period. By month 48, 169 (24.4%) and 158 (22.8%) of the 693 women who consented for ancillary KEEPS-Cog were lost to follow-up for cognitive assessment (3MS and cognitive factors) and mood evaluations (POMS), respectively. However, because LME models make full use all available data, including data from women with missing data, 95.5% of participants were included in the final analysis (n = 662 in cognitive analyses, and n = 661 in mood analyses). To be included in analyses, women must have provided baseline data, and data from at least one post-baseline visit. The mean length of follow-up was 2.85 y (standard deviation [SD] = 0.49) for cognitive outcomes and 2.76 (SD = 0.57) for mood outcomes. No treatment-related benefits were found on cognitive outcomes. For mood, model estimates indicated that women treated with o-CEE showed improvements in depression and anxiety symptoms over the 48 mo of treatment, compared to women on placebo. The model estimate for the depression subscale was  $-5.36 \times 10^{-2}$  (95% CI,  $-8.27 \times 10^{-2}$  to  $-2.44 \times 10^{-2}$ ; ES = 0.49,  $p < 0.001$ ) and for the anxiety subscale was  $-3.01 \times 10^{-2}$  (95% CI,  $-5.09 \times 10^{-2}$  to  $-9.34 \times 10^{-3}$ ; ES = 0.26,  $p < 0.001$ ). Mood outcomes for women randomized to t-E2 were similar to those for women on placebo. Importantly, the KEEPS-Cog results cannot be extrapolated to treatment longer than 4 y.

**CONCLUSIONS:** The KEEPS-Cog findings suggest that for recently postmenopausal women, MHT did not alter cognition as hypothesized. However, beneficial mood effects with small to medium ESs were noted with 4 y of o-CEE, but not with 4 y of t-E2. The generalizability of these findings is limited to recently postmenopausal women with low cardiovascular risk profiles.

**TRIAL REGISTRATION:**

ClinicalTrials.gov NCT00154180 and NCT00623311. PMID: 26035291

**IBS and Stress**

Am J Gastroenterol. 2015 Jun 16. doi: 10.1038/ajg.2015.147.

**The Relationship Among Perceived Stress, Symptoms, and Inflammation in Persons With Inflammatory Bowel Disease.**Targownik LE<sup>1</sup>, Sexton KA<sup>2</sup>, Bernstein MT<sup>2</sup>, Beatie B<sup>2</sup>, Sargent M<sup>1</sup>, Walker JR<sup>2</sup>, Graff LA<sup>2</sup>.

Author information

Abstract

**OBJECTIVES:**

Previous studies have demonstrated that stress is associated with increased disease activity in individuals with inflammatory bowel disease (IBD). The association between perceived stress and gastrointestinal inflammation is not well described.

**METHODS:**

Participants were recruited from a population-based registry of individuals with known IBD. Symptomatic disease activity was assessed using validated clinical indices: the Manitoba IBD Index (MIBDI) and Harvey Bradshaw Index (HBI) for Crohn's disease (CD), and Powell Tuck Index (PTI) for ulcerative colitis (UC). Perceived stress was measured using Cohen's Perceived Stress Scale (CPSS). Intestinal inflammation was determined through measurement of fecal calprotectin (FCAL), with a level exceeding 250 µg/g indicating significant inflammation. Logistic regressions were used to evaluate the association between intestinal inflammation, perceived stress, and disease activity.

**RESULTS:**

Of the 478 participants with completed surveys and stool samples, perceived stress was associated with symptomatic activity (MIBDI) for both CD and UC (1.07 per 1-point increase on the CPSS, 95% confidence interval (CI) 1.03-1.10 and 1.03-1.11, respectively). There was no significant association between perceived stress and intestinal inflammation for either CD or UC. Active symptoms (MIBDI ≤3) were associated with intestinal inflammation in UC (odds ratio (OR) 3.94, 95% CI 1.65-9.43), but not in CD (OR 0.98, 95% CI 0.51-1.88).

**CONCLUSIONS:**

Symptomatic disease activity was unrelated to intestinal inflammation in CD and only weakly associated in UC. Although there was a strong relationship between perceived stress and gastrointestinal symptoms, perceived stress was unrelated to concurrent intestinal inflammation. Longitudinal investigation is required to determine the directionality of the relationship between perceived stress, inflammation, and symptoms in IBD. *Am J Gastroenterol* advance online publication, 16 June 2015; doi:10.1038/ajg.2015.147.

PMID:2607717

**10 A. CERVICAL SPINE**

**Stenosis of lumbar spine increase cervical cord compression**

Eur Spine J. 2015 Jun 3.

**Does lumbar spinal stenosis increase the risk of spondylotic cervical spinal cord compression?**

Adamova B<sup>1</sup>, Bednarik J, Andrasinova T, Kovalova I, Kopacik R, Jabornik M, Kerkovsky M, Jakubcova B, Jarkovsky J.

Author information

Abstract

**PURPOSE:**

The aim of this prospective cross-sectional observational comparative study was to determine the prevalence of spondylotic cervical cord compression (SCCC) and symptomatic cervical spondylotic myelopathy (CSM) in patients with symptomatic lumbar spinal stenosis (LSS) in comparison with a general population sample and to seek to identify predictors for the development of CSM.

**METHODS:**

A group of 78 patients with LSS (48 men, median age 66 years) was compared with a randomly selected age- and sex-matched group of 78 volunteers (38 men, median age 66 years). We evaluated magnetic resonance imaging findings from the cervical spine and neurological examination.

**RESULTS:**

The presence of SCCC was demonstrated in 84.6 % of patients with LSS, but also in 57.7 % of a sample of volunteers randomly recruited from the general population. Clinically symptomatic CSM was found in 16.7 % of LSS patients in comparison with 1.3 % of volunteers ( $p = 0.001$ ). Multivariable logistic regression proposed the Oswestry Disability Index of 43 % or more as the only independent predictor of symptomatic CSM in LSS patients (OR 9.41,  $p = 0.008$ ).

**CONCLUSIONS:**

The presence of symptomatic LSS increases the risk of SCCC; the prevalence of SCCC is higher in patients with symptomatic LSS in comparison with the general population, with an evident predominance of more serious types of MRI-detected compression and a clinically symptomatic form (CSM). Symptomatic CSM is more likely in LSS patients with higher disability as assessed by the Oswestry Disability Index.

PMID: 26038157

### 13. CRANIUM/TMJ

#### Postural changes

Am J Orthod Dentofacial Orthop. 2015 Jun;147(6):747-54. doi: 10.1016/j.ajodo.2015.01.026.

#### Changes in natural head position after orthognathic surgery in skeletal Class III patients.

Cho D<sup>1</sup>, Choi DS<sup>2</sup>, Jang I<sup>3</sup>, Cha BK<sup>4</sup>.

Author information

Abstract

#### **INTRODUCTION:**

The purpose of this study was to evaluate the change in natural head position (NHP) after orthognathic surgery in skeletal Class III patients.

#### **METHODS:**

We used pretreatment (T1) and posttreatment (T2) cephalometric radiographs and T1 and T2 lateral facial photographs of 20 skeletal Class III patients (mean age, 21.6 years), with 20 skeletal Class I patients (mean age, 22.2 years) as the controls. The Class III patients had undergone mandibular setback surgery, and the patients in the control group had received conventional orthodontic treatment. All lateral facial photographs were recorded in NHP. The true vertical line (TVL) was transferred from the photograph to the cephalometric radiograph, and then the angle between the TVL and the Frankfort horizontal plane (TVL/FH) was measured. A t test and a paired t test were used to verify the differences between the 2 groups, and between the T1 and T2 measurements in each group.

#### **RESULTS:**

The mean TVL/FH at T1 was significantly greater in the Class III group than in the Class I group; this indicated that the Class III group showed head flexion. However, the mean TVL/FH of the Class III group decreased by  $-3.1^{\circ}$  at T2; this indicated head extension, and it did not significantly differ from that of the Class I group. Nineteen of the 20 Class I patients showed minimal or no change in their TVL/FH ( $-1.5^{\circ}$  to  $1.5^{\circ}$ ) at T2. On the other hand, 6 of the 20 Class III patients showed more than a  $4.5^{\circ}$  decrease in their TVL/FH at T2.

#### **CONCLUSIONS:**

Most of the Class I patients showed minimal or no change in their NHP at T2, but some Class III patients had changes in their NHP that tended toward head extension after mandibular setback surgery. Thus, soft tissue analysis using the TVL in NHP may not be reliable for some skeletal Class III patients who undergo mandibular setback surgery.

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PMID:26038079

**Hypnosis and TMJ relaxation**

J Oral Rehabil. 2015 Jun 7. doi: 10.1111/joor.12316.

**Effect of hypnosis on masseter EMG recorded during the 'resting' and a slightly open jaw posture.**

Al-Enaizan N<sup>1</sup>, Davey KJ<sup>1</sup>, Lyons MF<sup>1</sup>, Cadden SW<sup>1</sup>.

Author information

**Abstract**

The aim of this experimental study was to determine whether minimal levels of electromyographic activity in the masseter muscle are altered when individuals are in a verified hypnotic state. Experiments were performed on 17 volunteer subjects (8 male, 9 female) all of whom gave informed consent. The subjects were dentate and had no symptoms of pain or masticatory dysfunction. Surface electromyograms (EMGs) were made from the masseter muscles and quantified by integration following full-wave rectification and averaging. The EMGs were obtained (i) with the mandible in 'resting' posture; (ii) with the mandible voluntarily lowered (but with the lips closed); (iii) during maximum voluntary clenching (MVC). The first two recordings were made before, during and after the subjects were in a hypnotic state. Susceptibility to hypnosis was assessed with Spiegel's eye-roll test, and the existence of the hypnotic state was verified by changes in ventilatory pattern. On average, EMG levels expressed as percentages of MVC were less: (i) when the jaw was deliberately lowered as opposed to being in the postural position; (ii) during hypnosis compared with during the pre- and post-hypnotic periods.

However, analysis of variance followed by post hoc tests with multiple comparison corrections (Bonferroni) revealed that only the differences between the level during hypnosis and those before and after hypnosis were statistically significant ( $P < 0.05$ ). As the level of masseter EMG when the mandible was in 'resting' posture was reduced by hypnosis, it appears that part of that EMG is of biological origin.

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**KEYWORDS:**

electromyography; hypnosis; mandibular rest position; masseter muscle; pulmonary ventilation; vertical dimension

PMID:26059538

**Evolution of orthodontic treatment**

Am J Orthod Dentofacial Orthop. 2015 Jun;147(6):654-62. doi: 10.1016/j.ajodo.2015.03.012.

**Evolution of treatment mechanics and contemporary appliance design in orthodontics: A 40-year perspective.**

McLaughlin RP<sup>1</sup>, Bennett JC<sup>2</sup>.

Author information

**Abstract**

Until the early 1970s, successful treatment with the Begg technique and the Tweed edgewise technique required tedious wire bending. The introduction of Andrews' straight wire appliance changed that, and it was one of the most significant contributions in the history of orthodontics. The straight wire appliance significantly reduced the amount of wire bending and also brought along other options in treatment mechanics. Retraction of the canines with elastic chains and ligature wires became more common. Sliding mechanics in place of closing loops became the method of space closure for a significant number of clinicians. Edgewise force levels were initially used to close spaces; however, it was soon observed that lighter forces were more effective with sliding mechanics. Along with these changes, it became apparent that compensation in the appliance was needed, depending on the type of malocclusion and particularly with varying extraction sequences. Various appliance designs were developed to accommodate changes in mechanics and force levels.

These modifications improved tooth positions at the end of treatment as long as the brackets were properly placed. These major changes in appliances, force levels, and treatment mechanics can be traced back to the work of Dr Lawrence Andrews and the straight wire appliances.

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PMID:26038069

## Self esteem

Am J Orthod Dentofacial Orthop. 2015 Jun;147(6):711-8. doi: 10.1016/j.ajodo.2015.01.027.

**Craniodentofacial characteristics, dental esthetics-related quality of life, and self-esteem.**

Gavric A<sup>1</sup>, Mirceta D<sup>2</sup>, Jakobovic M<sup>2</sup>, Pavlic A<sup>3</sup>, Zrinski MT<sup>4</sup>, Spalj S<sup>5</sup>.

Author information

Abstract

**INTRODUCTION:**

Self-esteem is a psychological trait that may develop in interaction with craniodentofacial esthetics. The aim of this study was to explore the relationship among craniodentofacial characteristics, dental esthetics-related quality of life, and self-esteem in adolescents and young adults.

**METHODS:**

The study was cross-sectional; the sample included 200 pupils and university students (58% female) aged 13 to 33 years. The Rosenberg Self-Esteem Scale and the Psychosocial Impact of Dental Aesthetics Questionnaire were used. Craniodentofacial features were estimated by the method of Martin and Saller, the Index of Orthodontic Treatment Need, and the Index of Complexity, Outcome and Need.

**RESULTS:**

When malocclusion severity increases, dental esthetics-related quality of life decreases. The multiple linear regression showed that with the control of all other predictors in the model, the social impact of dental esthetics, borderline dental self-confidence, and facial type contribute the most to explain the variability of self-esteem, accounting for 3.2%, 1.3%, and 1.4%, respectively, of the variability values. The whole model accounts for 24.2% of the variability of self-esteem.

**CONCLUSIONS:**

In adolescents and young adults, self-esteem appears to be more influenced by the self-perceived psychosocial impacts of dental esthetics than the normative level of malocclusion, craniofacial typology, sex, or age.

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PMID: 26038075

**Facial pain and rhinosinusitis**

Int Forum Allergy Rhinol. 2015 Jun 13. doi: 10.1002/alr.21539.

**Characterization of facial pain associated with chronic rhinosinusitis using validated pain evaluation instruments.**

DeConde AS<sup>1</sup>, Mace JC<sup>2</sup>, Ashby S<sup>3</sup>, Smith TL<sup>2</sup>, Orlandi RR<sup>3</sup>, Alt JA<sup>3</sup>.

Author information

Abstract

**BACKGROUND:**

Prior investigations into facial pain associated with chronic rhinosinusitis (CRS) have yielded important results, but have yet to use pain-specific outcome measures. This study seeks to characterize facial pain associated with CRS using validated pain-specific instruments.

**METHODS:**

Adults with CRS were enrolled into a prospective, cross-sectional study along with control participants presenting with non-CRS diagnoses. Facial pain was characterized in both groups using the Brief Pain Inventory Short Form (BPI-SF) and the Short-Form McGill Pain Questionnaire (SF-MPQ). CRS-specific measures of disease were measured including the 22-item Sino-Nasal Outcome Test-22 (SNOT-22), nasal endoscopy, and computed tomography scoring.

**RESULTS:**

The patients comprised of CRS with nasal polyposis (CRSwNP; n = 25), CRS without nasal polyposis (CRSsNP; n = 30), and control participants (n = 8). Subjects with CRSwNP and CRSsNP were less likely to be pain free than controls (16.0%, 6.7%, and 62.5% respectively, p = 0.001) and carried greater burden of pain as measured by the BPI-SF and SF-MPQ than controls (p = 0.002 and p = 0.017, respectively). Pain in CRS was most commonly located around the eyes and characterized as "throbbing" and "aching." Nasal polyp status was not associated with differences in character, severity, or location of pain.

**CONCLUSION:**

Subjects with CRS have a greater burden of facial pain relative to control subjects across several standardized pain measures. Further, facial pain in CRS significantly correlated to quality of life and CRS-specific disease severity measures. Study across larger cohorts using standardized pain measures is warranted to clarify the association of facial pain with CRS.

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**KEYWORDS:**

data collection; endoscopy; facial pain; outcome assessment; sinusitis

PMID: 26074476

**14. HEADACHES****Sleep apnea HA**

J Headache Pain. 2015 Dec;16(1):540. doi: 10.1186/s10194-015-0540-6. Epub 2015 Jun 19.

**Sleep apnoea headache in obstructive sleep apnoea syndrome patients presenting with morning headache: comparison of the ICHD-2 and ICHD-3 beta criteria.**

Suzuki K<sup>1</sup>, Miyamoto M, Miyamoto T, Numao A, Suzuki S, Sakuta H, Iwasaki A, Watanabe Y, Fujita H, Hirata K.

Author information

Abstract

**BACKGROUND:**

Morning headache is associated with obstructive sleep apnoea syndrome (OSAS); however, OSAS patients present with various characteristics of morning headache, and they often do not fulfil the International Classification of Headache Disorders (ICHD)-2 criteria for "sleep apnoea headache". The aims of this study were to assess the new ICHD-3 beta criteria for sleep apnoea headache in OSAS patients and to evaluate the differences with the ICHD-2.

**METHODS:**

We conducted a cross-sectional survey regarding morning and sleep apnoea headaches that included 235 OSAS outpatients receiving continuous positive airway pressure (CPAP) treatment. The presence of morning headache was evaluated by reviewing the medical records before administration of CPAP treatment.

**RESULTS:**

Of all of the OSAS patients, 48 (20.4 %) reported morning headaches. Of the 48 patients with morning headaches, 29 (60.4 %) and 39 (81.3 %) fulfilled the ICHD-2 and ICHD-3 beta criteria for sleep apnoea headache, respectively. The increased frequency of individuals who qualified for diagnosis was likely attributable to the extension of headache duration from 30 min to 4 h. The severity of OSAS was not associated with the presence of sleep apnoea headache.

**CONCLUSIONS:**

The utilisation of ICHD-3 beta criteria is clinically useful for diagnosing sleep apnoea headache in patients with OSAS. Applying the ICHD-3 beta criteria was of clinical significance when considering the marked response of these headaches to CPAP therapy. The cause of sleep apnoea headache remains to be elucidated.

PMID: 26103955

**Neuromodulation**

Curr Opin Neurol. 2015 Jun;28(3):271-6. doi: 10.1097/WCO.000000000000196.

**Noninvasive neuromodulation in cluster headache.**

Láinez MJ<sup>1</sup>, Jensen R.  
Author information

## Abstract

***PURPOSE OF REVIEW:***

Neuromodulation is an alternative in the management of medically intractable cluster headache patients. Most of the techniques are invasive, but in the last 2 years, some studies using a noninvasive device have been presented. The objective of this article is to review the data using this approach.

***RECENT FINDINGS:***

Techniques as occipital nerve stimulation or sphenopalatine ganglion stimulation are recommended as first-line therapy in refractory cluster patients, but they are invasive and maybe associated with complications. Noninvasive vagal nerve stimulation with an external device has been tried in cluster patients. Results from clinical practice and a single randomized clinical trial have been presented showing a reduction of the number of cluster attacks/week in the patients treated with the device. The rate of adverse events was low and most of them were mild.

***SUMMARY:***

In the last decade, invasive neuromodulation treatments have demonstrated good efficacy in cluster refractory patients. Noninvasive approaches such as the noninvasive vagal nerve stimulation have shown efficacy in one trial and could be an easier alternative in the management of this debilitating headache. We need to replicate these results with further controlled studies and conduct basic research in order to clarify the mechanism of action.

PMID: 25887771

## Catastrophizing and obesity

Headache. 2015 Jun 18. doi: 10.1111/head.12597.

**Clinical Pain Catastrophizing in Women With Migraine and Obesity.**

Bond DS<sup>1</sup>, Buse DC<sup>2</sup>, Lipton RB<sup>2</sup>, Thomas JG<sup>1</sup>, Rathier L<sup>3</sup>, Roth J<sup>4</sup>, Pavlovic JM<sup>2</sup>, Evans EW<sup>1</sup>, Wing RR<sup>1</sup>.

Author information

Abstract

**OBJECTIVE/BACKGROUND:**

Obesity is related to migraine. Maladaptive pain coping strategies (eg, pain catastrophizing) may provide insight into this relationship. In women with migraine and obesity, we cross-sectionally assessed: (1) prevalence of clinical catastrophizing; (2) characteristics of those with and without clinical catastrophizing; and (3) associations of catastrophizing with headache features.

**METHODS:**

Obese women migraineurs seeking weight loss treatment (n = 105) recorded daily migraine activity for 1 month via smartphone and completed the Pain Catastrophizing Scale (PCS). Clinical catastrophizing was defined as total PCS score  $\geq 30$ . The six-item Headache Impact Test (HIT-6), 12-item Allodynia Symptom Checklist (ASC-12), Headache Management Self-Efficacy Scale (HMSE), and assessments for depression (Centers for Epidemiologic Studies Depression Scale) and anxiety (seven-item Generalized Anxiety Disorder Scale) were also administered. Using PCS scores and body mass index (BMI) as predictors in linear regression, we modeled a series of headache features (ie, headache days, HIT-6, etc) as outcomes.

**RESULTS:**

One quarter (25.7%; 95% confidence interval [CI] = 17.2-34.1%) of participants met criteria for clinical catastrophizing: they had higher BMI ( $37.9 \pm 7.5$  vs  $34.4 \pm 5.7$  kg/m<sup>2</sup>, P = .035); longer migraine attack duration ( $160.8 \pm 145.0$  vs  $97.5 \pm 75.2$  hours/month, P = .038); higher HIT-6 scores ( $68.7 \pm 4.6$  vs  $64.5 \pm 3.9$ , P < .001); more allodynia ( $7.0 \pm 4.1$  vs  $4.5 \pm 3.5$ , P < .003), depression ( $25.4 \pm 12.4$  vs  $13.3 \pm 9.2$ , P < .001), and anxiety ( $11.0 \pm 5.2$  vs  $5.6 \pm 4.1$ , P < .001); and lower self-efficacy ( $80.1 \pm 25.6$  vs  $104.7 \pm 18.9$ , P < .001) compared with participants without clinical catastrophizing. The odds of chronic migraine were nearly fourfold greater in those with (n = 8/29.6%) vs without (n = 8/10.3%) clinical catastrophizing (odds ratio = 3.68; 95%CI = 1.22-11.10, P = .021). In all participants, higher PCS scores were related to more migraine days ( $\beta = 0.331$ , P = .001), longer attack duration ( $\beta = 0.390$ , P < .001), higher HIT-6 scores ( $\beta = 0.425$ , P < .001), and lower HMSE scores ( $\beta = -0.437$ , P < .001). Higher BMI, but not higher PCS scores, was related to more frequent attacks ( $\beta = -0.203$ , P = .044).

**CONCLUSIONS:**

One quarter of participants with migraine and obesity reported clinical catastrophizing. These individuals had more frequent attacks/chronicity, longer attack duration, higher pain sensitivity, greater headache impact, and lower headache management self-efficacy. In all participants, PCS scores were related to several migraine characteristics, above and beyond the effects of obesity. Prospective studies are needed to determine sequence and mechanisms of relationships between catastrophizing, obesity, and migraine.

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**KEYWORDS:** *allodynia; migraine; obesity; pain catastrophizing; smartphone; woman*

PMID: 26087348

**Childhood violence and HA's****The painful legacy of childhood violence: migraine headaches among adult survivors of adverse childhood experiences**

Headache: The Journal of Head and Face Pain, 06/24/2015 Brennenstuhl S, et al.

The aim of this study was to investigate the relationship between early adversities and migraine, while controlling for a range of potential explanatory factors. Number and type of early adversities are associated with migraine among Canadian men and women.

**Methods**

The authors analyzed data from the 2012 Canadian Community Health Survey - Mental Health. Using a representative sample of 10,358 men and 12,638 women, they undertook gender-specific logistic regression analyses to determine the association between number and type of self-reported childhood adversities (physical abuse, sexual abuse, and witnessing parental domestic violence) and migraine, while controlling for sociodemographics, comorbid adversities, health behaviors, depression, and anxiety.

**Results**

In total, 6.5% of men and 14.2% of women reported migraines.

All three adversities were significantly associated with migraine for both genders, even after controlling for a range of variables.

The fully adjusted odds of migraine associated with physical abuse, parental domestic violence, and sexual abuse were 1.61 (95% confidence interval [CI] = 1.42-1.83), 1.64 (95% CI = 1.39-1.93), and 1.32 (95% CI = 1.11-1.57), respectively, for women, and 1.50 (95% CI = 1.25-1.80), 1.52 (95% CI = 1.16-1.98), and 1.70 (95% CI = 1.22-2.36) for men.

Greater number of adversities was also associated with increasing odds of migraine.

Men reporting all three adversities had over three times (odds ratio = 3.26; 95% CI = 2.09-5.07) and women over two times (OR = 2.85; 95% CI = 2.25-3.60) the odds of migraine compared with those without childhood adversities.

**Migraine aura classification**

Curr Opin Neurol. 2015 Jun;28(3):255-60. doi: 10.1097/WCO.000000000000193.

**Migraine aura: new ideas about cause, classification, and clinical significance.**

Charles A<sup>1</sup>, Hansen JM.

Author information

Abstract

***PURPOSE OF REVIEW:***

The migraine aura is a dramatic spontaneous change in brain activity resulting in a variety of transient neurological symptoms. The purpose of this review is to address recent advances in the understanding of aura and its role in migraine.

***RECENT FINDINGS:***

The formal classification of migraine aura is becoming both broader and more detailed. Traditionally viewed as a primary event that triggers a migraine attack, studies regarding the timing of aura relative to other symptoms of migraine indicate that it may not in fact play a primary role in initiating an attack. Careful recording and analysis of visual aura symptoms provides new insight into the initiation and propagation of the underlying brain phenomenon, and the different regions of visual cortex that produce different visual perceptions. Migraine with aura may have different responses to acute and preventive therapies.

***SUMMARY:***

There has been significant evolution of concepts regarding the causes of migraine aura, how it is best defined, and how it fits into the picture of the migraine disorder as a whole. Regardless of its exact role in the genesis of migraine, an increased understanding of aura has the potential to provide important new insight into not only migraine but also fundamental mechanisms of brain physiology.

PMID: 25923125

**28. REPLACEMENTS****Impact of cementless HR**

Scand J Med Sci Sports. 2015 Jun 3. doi: 10.1111/sms.12482.

**Sports and physical activity after cementless total hip arthroplasty with a minimum follow-up of 10 years.**

Innmann MM<sup>1</sup>, Weiss S<sup>2</sup>, Andreas F<sup>1</sup>, Merle C<sup>1</sup>, Streit MR<sup>1</sup>.

Author information

**Abstract**

The present retrospective cohort study was conducted to compare sporting activity levels before and a minimum of 10 years after primary cementless total hip arthroplasty (THA). A consecutive series of 86 patients with a mean age at surgery of 52 years (range, 21-60 years) was evaluated 11 years after surgery (range, 10-12 years). Pre- and post-operative sporting activities were assessed at routine follow-up using the University of California, Los Angeles activity score and the Schulthess Clinic sports and activity questionnaire. Post-operative health-related quality of life was measured using the Short-Form 36 (SF-36) questionnaire and compared with age-matched reference populations from the SF-36 database. Eleven years after THA, 89% of preoperatively active patients had returned to sport. Comparing sports activity preoperatively (before the onset of symptoms) and 11 years after THA, no significant difference was found for the mean number of disciplines or session length. A significant decline in high-impact activities was observed, while participation in low-impact activities significantly increased. Health-related quality of life compared well against a healthy age-matched reference population and was significantly higher than in a reference group of patients with osteoarthritis. T

the majority of patients were able to maintain their physical activity level in the long term after primary cementless THA, compared with the activity level before the onset of restricting osteoarthritis symptoms. However, a change in disciplines toward low-impact activities was observed.

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**KEYWORDS:**

Sport; hip arthroplasty; hip replacement; long term; physical activity

PMID: 26041645

## 29. OA

**Minimal gait changes with time with OA****Gait Characteristics, Symptoms and Function in Persons With Hip Osteoarthritis: A Longitudinal Study With 6-7 Years Follow-Up**

**Authors:** Ingrid Eitzen, PT, PhD<sup>1,2</sup>, Linda Fernandes, PT, PhD<sup>1,3</sup>, Heidi Kallerud, PT, MSc<sup>1</sup>, Lars Nordsetten, MD, PhD<sup>2</sup>, Brian Knarr, PhD<sup>4</sup>, May Arna Risberg, PT, PhD<sup>1,5</sup>

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, Ahead of Print **Pages:** 1-28 doi:10.2519/jospt.2015.5441

**Study Design** Longitudinal laboratory study.

**Objectives** 1) To compare gait characteristics between individuals with early stage hip osteoarthritis who later underwent total hip replacement (THR), and persons who did not undergo THR. 2) To evaluate whether gait characteristics, function, or symptoms declined among persons who did not undergo THR during a 6-7 year follow-up.

**Background** The natural history of symptoms, function, and gait changes secondary to hip osteoarthritis, including potential differences at an early stage of disease, is unknown.

**Methods** Forty-three individuals (mean age 58.9 years) with radiographic and symptomatic hip osteoarthritis participated. Outcome measures included 3D-gait analysis, self-reported pain, stiffness and function, hip range of motion and the 6-minute walk test. Baseline comparisons between individuals who later underwent THR and those who did not undergo THR were made using independent t-test/Mann-Whitney U-test. Comparison of baseline measures and 6-7 year follow-up for the non-operated individuals were conducted with paired samples t-test/Wilcoxon's Sign Rank Test ( $p < 0.05$ ).

**Results** Twelve of the 43 individuals initially evaluated (27.9%) had not undergone THR at the 6-7 year follow-up. At baseline, these individuals had larger sagittal plane hip and knee joint excursions, larger joint space width, lower body mass index, and superior self-reported function, compared with the individuals who later underwent THR. At the 6-7 year follow-up, the individuals who did not undergo THR exhibited no decline in gait characteristics, minimum joint space, or overall function. Furthermore, their self-reported pain had significantly reduced ( $p = 0.024$ ).

**Conclusions** Individuals who did not undergo THR during a 6-7 year follow-up period did not exhibit a decline in gait, function or symptoms compared to those who underwent THR. These findings are suggestive of a phenotype of hip osteoarthritis with a very slow disease progression, particularly in regards to pain. **Level of Evidence** Prognosis, level 1b. *J Orthop Sports Phys Ther*, Epub 21 May 2015. doi:10.2519/jospt.2015.5441

**30 A. IMPINGEMENT**

Am J Sports Med. 2014 Oct;42(10):2402-9. doi: 10.1177/0363546514541229. Epub 2014 Jul 24.

**Effect of changes in pelvic tilt on range of motion to impingement and radiographic parameters of acetabular morphologic characteristics.**

Ross JR1, Nepple JJ2, Philippon MJ2, Kelly BT3, Larson CM4, Bedi A5.

**Author information****Abstract****BACKGROUND:**

The current understanding of the effect of dynamic changes in pelvic tilt on the functional acetabular orientation and occurrence of femoroacetabular impingement (FAI) is limited.

**PURPOSE:**

To determine the effect of changes in pelvic tilt on (1) terminal hip range of motion and (2) measurements of acetabular version as assessed on 2- and 3-dimensional imaging.

**STUDY DESIGN:**

Controlled laboratory study.

**METHODS:**

Preoperative pelvic computed tomographic scans of 48 patients (50 hips) who underwent arthroscopic surgery for the treatment of FAI were analyzed. The mean age of the study population was 25.7 years (range, 14-56 years), and 56% were male. Three-dimensional models of the hips were created, allowing manipulation of the pelvic tilt and simulation of hip range of motion to osseous contact. Acetabular version was measured and the presence of the crossover sign, prominent ischial spine sign, and posterior wall sign was recorded on simulated plain radiographs. Measurements of range of motion to bony impingement during (1) hip flexion, (2) internal rotation in 90° of flexion, and (3) internal rotation in 90° of flexion and 15° adduction were performed, and the location of bony contact between the proximal femur and acetabular rim was defined. These measurements were calculated for -10° (posterior), 0° (native), and +10° (anterior) pelvic orientations.

**RESULTS:**

In native tilt, mean cranial acetabular version was 3.3°, while central version averaged 16.2°. Anterior pelvic tilt (10° change) resulted in significant retroversion, with mean decreases in cranial and central version of 5.9° and 5.8°, respectively ( $P < .0001$  for both). Additionally, this resulted in a significantly increased proportion of positive crossover, posterior wall, and prominent ischial spine signs ( $P < .001$  for all). Anterior pelvic tilt (10° change) resulted in a decrease in internal rotation in 90° of flexion of 5.9° ( $P < .0001$ ) and internal rotation in 90° of flexion and 15° adduction of 8.5° ( $P < .0001$ ), with a shift in the location of osseous impingement more anteriorly. Posterior pelvic tilt (10° change) resulted in an increase in internal rotation in 90° of flexion of 5.1° ( $P < .0001$ ) and internal rotation in 90° of flexion and 15° adduction of 7.4° ( $P < .0001$ ), with a superolateral shift in the location of osseous impingement.

**CONCLUSION/CLINICAL RELEVANCE:**

Dynamic changes in pelvic tilt significantly influence the functional orientation of the acetabulum and must be considered. Dynamic anterior pelvic tilt is predicted to result in earlier occurrence of FAI in the arc of motion, whereas dynamic posterior pelvic tilt results in later occurrence of FAI, which may have implications regarding nonsurgical treatments for FAI.

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**KEYWORDS:**

acetabular version; computed tomography; computer modeling; femoroacetabular impingement; pelvic tilt

**31. KNEE****32 A. KNEE/ACL****Changing landing patterns post surgery**

Knee Surg Sports Traumatol Arthrosc. 2015 Jun 5.

**Landing mechanics during single hop for distance in females following anterior cruciate ligament reconstruction compared to healthy controls.**

Trigsted SM<sup>1</sup>, Post EG, Bell DR.  
Author information

Abstract

**PURPOSE:**

To determine possible differences in single-hop kinematics and kinetics in females with anterior cruciate ligament reconstruction compared to healthy controls. A second purpose was to make comparisons between the healthy and reconstructed limbs.

**METHODS:**

Subjects were grouped based on surgical status (33 ACLR patients and 31 healthy controls). 3D motion capture synchronized with force plates was used to capture the landing phase of three successful trials of single hop for distance during a single data collection session. Peak values during the loading phase were analysed. Subjects additionally completed three successful trials of the triple hop for distance Tegner activity scale and International Knee Document Committee 2000 (IKDC).

**RESULTS:**

Controls demonstrated greater peak knee flexion and greater internal knee extension moment and hip extension moment than ACLR subjects. Within the ACLR group, the healthy limb exhibited greater peak knee flexion, hip flexion, hip extension moment, single hop and triple hops for distance and normalized quadriceps strength.

**CONCLUSION:**

Patients who undergo anterior cruciate ligament reconstruction land in a more extended posture when compared to healthy controls and compared to their healthy limb.

**LEVEL OF EVIDENCE: III.**

PMID: 26044352

**Cutting maneuvers and ACL**

Knee. 2015 Jun 3. pii: S0968-0160(15)00109-X. doi: 10.1016/j.knee.2015.05.005.

**Lower limb kinematics of male and female soccer players during a self-selected cutting maneuver: Effects of prolonged activity.**

McGovern A<sup>1</sup>, Dude C<sup>1</sup>, Munkley D<sup>1</sup>, Martin T<sup>2</sup>, Wallace D<sup>1</sup>, Feinn R<sup>3</sup>, Dione D<sup>4</sup>, Garbalosa JC<sup>5</sup>.  
Author information

Abstract

**BACKGROUND:**

Despite the recent emphasis on injury prevention, anterior cruciate ligament (ACL) injury rates remain high. This study aimed to ascertain the effects of prolonged activity on lower limb kinematics during a self-selected cutting maneuver.

**METHODS:**

Angular kinematics were recorded during an agility test performed until the completion time was greater than the mean plus one SD of baseline trials. Cut type was identified and the hip and knee angles at 33 ms post heel strike were determined. A linear mixed effects model assessed the effects of cut type, gender, and activity status on the hip and knee angles.

**RESULTS:**

Males performed sidestep cuts more frequently than females. Females increased the incidence of sidestep cuts after prolonged activity. At the hip, a gender-cut type interaction existed for the transverse ( $p=0.001$ ) and sagittal ( $p=0.11$ ) planes. Females showed more internal rotation during sidestep and more external rotation and less flexion during crossover cuts. For the frontal plane, a gender-activity status interaction ( $p = 0.032$ ) was due to no change within females but greater hip adduction during prolonged activity within males. With prolonged activity, both genders displayed less hip ( $p=0.29$ ) and knee ( $p=0.009$ ) flexion and more knee ( $p=0.001$ ) adduction. Females displayed less hip and knee flexion than men ( $p=0.001$ ).

**CONCLUSIONS:**

Sidestep may be more risky than crossover cuts. Both genders place themselves in at-risk postures with prolonged activity due to less hip and knee flexion.

**LEVEL OF EVIDENCE:**

Level 4.

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**KEYWORDS:**

ACL; Cutting; Kinematics; Knee

PMID: 26050139

34. PATELLA

Atrophy of VMO

**Atrophy of the Quadriceps is Not Isolated to Vastus Medialis Oblique in Individuals With Patellofemoral Pain**

**Authors:** Lachlan S. Giles, PT<sup>1</sup>, Kate E. Webster, PhD<sup>2</sup>, Jodie A. McClelland, PhD<sup>3</sup>, Jill Cook, PhD

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, Ahead of Print **Pages:** 1-22 doi:10.2519/jospt.2015.5852

- **Abstract**
- **Study Design** Cross-sectional.

**Objectives** To determine if quadriceps atrophy was present in people with patellofemoral pain (PFP), and whether vastus medialis oblique (VMO) was selectively involved.

**Background** It has been suggested that selective atrophy of VMO relative to vastus lateralis could be associated with PFP, despite a lack of studies investigating individual quadriceps muscle size in individuals with PFP.

**Methods** The quadriceps muscle size of 35 participants with PFP (22 with unilateral and 13 with bilateral symptoms) and 35 asymptomatic control participants matched for age and gender were measured using real-time ultrasound. The thickness of the VMO, vastus lateralis, vastus medialis, rectus femoris, and vastus intermedius were measured. Paired samples t-tests were used to compare muscle thickness between limbs in those with unilateral PFP, and independent t-tests were used to compare muscle thickness between groups with and without PFP.

**Results** In those with unilateral PFP, the thickness of all portions of the quadriceps muscle was statistically smaller in the symptomatic compared to the asymptomatic limb: VMO (P = .038), vastus medialis (P < .001), vastus lateralis (P = .005), vastus intermedius (P = .013), rectus femoris (P = .045). No difference was found for the thickness of any portions of the quadriceps in people with PFP compared to asymptomatic controls: VMO (P = .148), vastus medialis (P = .474), vastus lateralis (P = .122), vastus intermedius (P = .466), rectus femoris (P = .508).

**Conclusion** Atrophy of all portions of the quadriceps muscles is present in the affected limb of people with unilateral PFP. There was no atrophy of the quadriceps in individuals with PFP compared to those without pathology. Selective atrophy of VMO relative to vastus lateralis was not identified in people with PFP. *J*

*Orthop Sports Phys Ther*, Epub 25 Jun 2015. doi:10.2519/jospt.2015.5852

**Keyword:** anterior knee pain, chondromalacia, quadriceps femoris, ultrasound imaging, VMO

**35. KNEE/TOTAL****Manipulations/revisions**

J Arthroplasty. 2015 Jun 3. pii: S0883-5403(15)00473-8. doi: 10.1016/j.arth.2015.01.061.

**Manipulation Under Anesthesia After Total Knee Arthroplasty is Associated with An Increased Incidence of Subsequent Revision Surgery.**

Werner BC<sup>1</sup>, Carr JB<sup>1</sup>, Wiggins JC<sup>1</sup>, Gwathmey FW<sup>1</sup>, Browne JA<sup>1</sup>.

Author information

- <sup>1</sup>Department of Orthopaedic Surgery, University of Virginia Health System, Charlottesville, Virginia.

**Abstract**

A national database was used to evaluate the risk for manipulation under anesthesia (MUA) after total knee arthroplasty (TKA), the association of demographics and comorbidities with needing MUA, and the risk of revision TKA after MUA. Of the 141,016 patients who underwent TKA, 4.3% required MUA within 6months. Age under 50years (OR: 2.79, P<0.0001), age 50-65years (OR: 2.03, P<0.0001), and female gender (OR: 1.12, P<0.0001) were all associated with increased rates of MUA. In patients under age 65years, smoking (OR: 1.47, P<0.0001) was associated with an increased rate of MUA. Patients who require MUA within 6months after TKA have a significantly increased risk of early revision TKA (OR: 2.43, P<0.0001).

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**KEYWORDS:**

arthrofibrosis; manipulation under anesthesia; revision; risk factors; total knee arthroplasty

PMID: 26071252

**37. OSTEOARTHRITIS/KNEE****Anti-inflammatory progress****Inflammatory pathways in knee osteoarthritis: Potential targets for treatment**

Current Rheumatology Reviews, 06/25/2015 BarOr D, et al.

**Abstract:**

Osteoarthritis (OA) of the knee is a wide-spread, debilitating disease that is prominent in Western countries. It is associated with old age, obesity, and mechanical stress on the knee joint. By examining the recent literature on the effect of the anti-inflammatory prostaglandins 15d-PGJ2 and  $\Delta$ 12-PGJ2, we propose that new therapeutic agents for this disease could facilitate the transition from the COX-2-dependent pro-inflammatory synthesis of the prostaglandin PGE2 (catalyzed by mPGES-1), to the equally COX-2-dependent synthesis of the aforementioned anti-inflammatory prostaglandins. This transition could be instrumental in halting the breakdown of cartilage via matrix metalloproteinases (MMPs) and aggrecanases, as well as promoting the matrix regeneration and synthesis of cartilage by chondrocytes.

Another desirable property of new OA therapeutics could involve the recruitment of mesenchymal stem cells to the damaged cartilage and bone, possibly resulting in the generation of chondrocytes, synoviocytes, and, in the case of bone, osteoblasts. Moreover, we propose that research promoting this transition from pro-inflammatory to anti-inflammatory prostaglandins could aid in the identification of new OA therapeutics.

**40. ANKLE SPRAINS AND INSTABILITY****Dynamic Balance Deficits 6 Months Following First-Time Acute Lateral Ankle Sprain: A Laboratory Analysis**

**Authors:** Cailbhe Doherty, BSc<sup>1</sup>, Chris Bleakley, PhD<sup>3</sup>, Jay Hertel, PhD<sup>4</sup>, Brian Caulfield, PhD<sup>1</sup>, John Ryan, MD<sup>5</sup>, Eamonn Delahunt, PhD<sup>1,2</sup>

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**Published:** *Journal of Orthopaedic & Sports Physical Therapy*, Ahead of Print **Pages:** 1-29 doi:10.2519/jospt.2015.5653

**Study Design** Controlled laboratory study.

**Objective** To utilize kinematic and stabilometric measures to compare dynamic balance during performance of the Star Excursion Balance Test (SEBT) between persons 6-months post first-time lateral ankle sprain (LAS) and a non-injured control group.

**Background** Biomechanical evaluation of dynamic balance in persons following first-time LAS during SEBT performance could provide insight into the mechanism(s) by which individuals proceed to recover fully, or develop chronic ankle instability.

**Methods** Sagittal-plane kinematics of the lower extremity and the center of pressure (COP) path during the performance of the anterior (ANT), posterior-lateral (PL) and posterior-medial (PM) reach directions of the SEBT were obtained from 69 participants, 6 months following first-time acute LAS. Data also were obtained from 20 non-injured controls.

**Results** The LAS group displayed lower normalized reach distances in all 3 reach directions compared to control participants on their injured and non-injured limbs with the largest observed effect size in the PL direction ( $p = 0.001$ ,  $\eta_p^2 = 0.07$ ). The performance impairment was associated with less hip and knee flexion and ankle dorsiflexion at the point of maximum reach ( $p < 0.02$ ) for all 3 reach directions, and coincided with less complexity of the COP path ( $p < 0.05$ ) in the PL direction only.

**Conclusion** Participants with a 6-month history of LAS exhibit persistence of deficits previously established in the acute phase of injury.

**Level of Evidence** Level 4. *J Orthop Sports Phys Ther*, Epub 24 Jun 2015. doi:10.2519/jospt.2015.5653 **Keyword:** ankle joint, biomechanical phenomena, kinematics, kinetics, postural balance

**41 A. ACHILLES TENDON AND CALF****Eccentric vs slow resistance**

Am J Sports Med. 2015 May 27. pii: 0363546515584760.

**Heavy Slow Resistance Versus Eccentric Training as Treatment for Achilles Tendinopathy: A Randomized Controlled Trial.**

Beyer R1, Kongsgaard M2, Hougs Kjær B3, Øhlenschläger T2, Kjær M2, Magnusson SP4.

**Author information****Abstract****BACKGROUND:**

Previous studies have shown that eccentric training has a positive effect on Achilles tendinopathy, but few randomized controlled trials have compared it with other loading-based treatment regimens.

**PURPOSE:**

To evaluate the effectiveness of eccentric training (ECC) and heavy slow resistance training (HSR) among patients with midportion Achilles tendinopathy.

**STUDY DESIGN:**

Randomized controlled trial; Level of evidence, 1.

**METHODS:**

A total of 58 patients with chronic (>3 months) midportion Achilles tendinopathy were randomized to ECC or HSR for 12 weeks. Function and symptoms (Victorian Institute of Sports Assessment-Achilles), tendon pain during activity (visual analog scale), tendon swelling, tendon neovascularization, and treatment satisfaction were assessed at 0 and 12 weeks and at the 52-week follow-up. Analyses were performed on an intention-to-treat basis.

**RESULTS:**

Both groups showed significant ( $P < .0001$ ) improvements in Victorian Institute of Sports Assessment-Achilles and visual analog scale from 0 to 12 weeks, and these improvements were maintained at the 52-week follow-up. Concomitant with the clinical improvement, there was a significant reduction in tendon thickness and neovascularization. None of these robust clinical and structural improvements differed between the ECC and HSR groups. However, patient satisfaction tended to be greater after 12 weeks with HSR (100%) than with ECC (80%;  $P = .052$ ) but not after 52 weeks (HSR, 96%; ECC, 76%;  $P = .10$ ), and the mean training session compliance rate was 78% in the ECC group and 92% in the HSR group, with a significant difference between groups ( $P < .005$ ).

**CONCLUSION:**

The results of this study show that both traditional ECC and HSR yield positive, equally good, lasting clinical results in patients with Achilles tendinopathy and that the latter tends to be associated with greater patient satisfaction after 12 weeks but not after 52 weeks.

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**KEYWORDS:**

Achilles tendon; eccentric training; heavy slow resistance training; tendinopathy

**42. PLANTAR SURFACE****Percutaneous fasciotomy**

J Foot Ankle Surg. 2015 Jun 6. pii: S1067-2516(15)00037-X. doi: 10.1053/j.jfas.2015.02.008.

**Treatment of Chronic Plantar Fasciitis With Percutaneous Latticed Plantar Fasciotomy.**

Yanbin X<sup>1</sup>, Haikun C<sup>2</sup>, Xiaofeng J<sup>3</sup>, Wanshan Y<sup>4</sup>, Shuangping L<sup>5</sup>.

Author information

**Abstract**

Plantar fasciitis, the most common cause of pain in the inferior heel, accounts for 11% to 15% of all foot symptoms requiring professional care among adults. The present study reports the results of a minimally invasive surgical treatment of chronic plantar fasciitis. All patients with plantar fasciitis who had undergone percutaneous latticed plantar fasciotomy at 3 clinical sites from March 2008 to March 2009 were included in the present study. The follow-up evaluations for this treatment were conducted using the Mayo clinical scoring system. We investigated 17 patients with recalcitrant chronic plantar fasciitis who had undergone this treatment within a follow-up period of  $\geq 13$  months. All procedures were performed in the clinic with the patient under local anesthesia. No wound infections or blood vessel or nerve damage occurred. At a mean follow-up period of  $16.0 \pm 2.29$  (range 13 to 21) months, significant improvement was seen in the preoperative mean Mayo score (from  $12.06 \pm 2.54$  to  $89.76 \pm 4.28$ ,  $p < .001$ ) and no patient had developed symptom recurrence. Also, none of the patients had developed complex regional pain syndrome.

All patients were able to return to regular shoe wear by 3 weeks postoperatively. The technique of plantar fasciitis with percutaneous latticed plantar fasciotomy could be a promising treatment option for patients with recalcitrant chronic plantar fasciitis.

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**KEYWORDS:**

calcaneus; fasciosis; heel pain; plantar fasciitis; surgery

PMID: 26058817

## 48 A. STM

## Tendon adaption and response

**Human tendon adaptation in response to mechanical loading: a systematic review and meta-analysis of exercise intervention studies on healthy adults**

Sebastian Bohm, Falk Mersmann and Adamantios Arampatzis\*

## Abstract

**Background:** The present article systematically reviews recent literature on the in vivo adaptation of asymptomatic human tendons following increased chronic mechanical loading, and meta-analyzes the loading conditions, intervention outcomes, as well as methodological aspects.

**Methods:** The search was performed in the databases PubMed, Web of Knowledge, and Scopus as well as in the reference lists of the eligible articles. A study was included if it conducted (a) a longitudinal exercise intervention ( $\geq 8$  weeks) on (b) healthy humans (18 to 50 years), (c) investigating the effects on mechanical (i.e., stiffness), material (i.e., Young's modulus) and/or morphological properties (i.e., cross-sectional area (CSA)) of tendons in vivo, and was reported (d) in English language. Weighted average effect sizes (SMD, random-effects) and heterogeneity (Q and  $I^2$  statistics) of the intervention-induced changes of tendon stiffness, Young's modulus, and CSA were calculated. A subgroup analysis was conducted regarding the applied loading intensity, muscle contraction type, and intervention duration. Further, the methodological study quality and the risk of bias were assessed.

**Results:** The review process yielded 27 studies with 37 separate interventions on either the Achilles or patellar tendon (264 participants). SMD was 0.70 (confidence interval: 0.51, 0.88) for tendon stiffness (N=37), 0.69 (0.36, 1.03) for Young's modulus (N=17), and 0.24 (0.07, 0.42) for CSA (N=33), with significant overall intervention effects ( $p < 0.05$ ). The heterogeneity analysis (stiffness:  $I^2 = 30\%$ ; Young's modulus:  $I^2 = 57\%$ ; CSA:  $I^2 = 21\%$ ) indicated that differences in the loading conditions may affect the adaptive responses. The subgroup analysis confirmed that stiffness adaptation significantly ( $p < 0.05$ ) depends on loading intensity ( $I^2 = 0\%$ ), but not on muscle contraction type. Although not significantly different, SMD was higher for interventions with longer duration ( $\geq 12$  weeks). The average score of  $71 \pm 9\%$  in methodological quality assessment indicated an appropriate quality of most studies.

**Conclusions:** The present meta-analysis provides elaborate statistical evidence that tendons are highly responsive to diverse loading regimens. However, the data strongly suggests that loading magnitude in particular plays a key role for tendon adaptation in contrast to muscle contraction type. Furthermore, intervention-induced changes in tendon stiffness seem to be more attributed to adaptations of the material rather than morphological properties.

## Dry needling research

**Baseline Examination Factors Associated With Clinical Improvement After Dry Needling in Individuals With Low Back Pain**

**Authors:** Shane L. Koppenhaver, PT, PhD<sup>1</sup>, Michael J. Walker, PT, DSc<sup>3</sup>, Ryan W. Smith, DPT<sup>1</sup>, Jacquelynn M. Booker, DPT<sup>1</sup>, Isaac D. Walkup, DPT<sup>1</sup>, Jonathan Su, DPT<sup>1</sup>, Jeffrey J. Hebert, PhD, DC<sup>2</sup>, Timothy Flynn, MD, PhD<sup>3</sup>

- **Abstract**

**Study Design** Quasi-experimental.

**Objectives** To explore for associations between demographic, patient history, and physical examination variables and short-term improvement in self-reported disability following dry needling therapy performed on individuals with low back pain (LBP).

**Background** Dry needling is an intervention used with increasing frequency in patients with LBP, however, the characteristics of patients who are most likely to respond are not known.

**Methods** Seventy-two volunteers with mechanical LBP participated in the study. Potential prognostic factors were collected from baseline questionnaires, patient history, and physical examination tests. Treatment consisted of dry needling to the lumbar multifidus muscles bilaterally which was administered during a single treatment session. Improvement was based on percent change in the Oswestry Disability Index (ODI) at 1 week. The univariate and multivariate associations between 33 potential prognostic factors and improved disability were assessed with correlation coefficients and multivariate linear regression.

**Results** Increased LBP with the multifidus lift test (MLT) ( $r_{pb} = 0.31$ ,  $P = .01$ ) or during passive hip flexion performed with the patient supine ( $r_{pb} = 0.23$ ,  $P = .06$ ), as well as positive beliefs about acupuncture/dry needling ( $\rho = 0.22$ ,  $P = .07$ ) demonstrated univariate associations with ODI improvement. Aggravation of LBP with standing ( $r_{pb} = -0.27$ ,  $P = .03$ ), presence of leg pain ( $r_{pb} = -0.29$ ,  $P = .02$ ), and any perception of hypermobility in the lumbar spine ( $r_{pb} = -0.21$ ,  $P = .09$ ) were associated with less improvement. The multivariate model identified 2 predictors of improved disability with dry needling: pain with MLT and no aggravation with standing ( $R^2 = 0.16$ ,  $P = .01$ ).

**Conclusion** Increased LBP with the MLT was the strongest predictor of improved disability after dry needling suggesting that the finding of pain during muscle contraction should be studied in future dry needling studies. *J Orthop Sports Phys Ther*, Epub 25 Jun 2015.  
*doi:10.2519/jospt.2015.5801*

**Keyword:** clinical prediction rule, lumbar spine, Oswestry, trigger point

## Massage and cancer

August 2015 Volume 21, Issue 3, Pages 154–159

### **Effect of massage therapy on pain, anxiety, relaxation, and tension after colorectal surgery: A randomized study\*\*\*\*\***

Nikol E. Dreyer Susanne M. Cutshall Marianne Huebner Diane M. Foss Jenna K. Lovely Brent A. Bauer Robert R. Cima

Complementary Therapies in Clinical Practice , 06/24/2015

DOI: <http://dx.doi.org/10.1016/j.ctcp.2015.06.004>

#### Highlights

- We evaluated the effects of massage therapy after colorectal surgery.
- We examined changes in pain, anxiety, tension, and overall relaxation.
- Patients who underwent colorectal surgery benefitted from massage therapy.
- Massage may be beneficial in the recovery from colorectal surgery.

#### Abstract

The purpose of this randomized controlled trial was to evaluate the effect of postoperative massage in patients undergoing abdominal colorectal surgery. One hundred twenty-seven patients were randomized to receive a 20-min massage (n = 61) or social visit and relaxation session (no massage; n = 66) on postoperative days 2 and 3. Vital signs and psychological well-being (pain, tension, anxiety, satisfaction with care, relaxation) were assessed before and after each intervention.

The study results indicated that postoperative massage significantly improved the patients' perception of pain, tension, and anxiety, but overall satisfaction was unchanged. In conclusion, massage may be beneficial during postoperative recovery for patients undergoing abdominal colorectal surgery. Further studies are warranted to optimize timing and duration and to determine other benefits in this clinical setting.

#### Keywords:

Anxiety, Complementary therapies, Integrative medicine, Massage, Pain, Surgery

## 49. STRETCHING

### Flexibility and force production

Scand J Med Sci Sports. 2015 May 30. doi: 10.1111/sms.12488.

#### **Hamstrings functional properties in athletes with high musculo-skeletal flexibility.**

Moltubakk MM1, Eriksrud O1, Paulsen G1, Seynnes OR1, Bojsen-Møller J1.

#### **Author information**

#### **Abstract**

The purpose of this study was to examine whether athletes with highly flexible hamstring muscle-tendon units display different passive and contractile mechanical properties compared with controls. Flexibility, passive, and active torque-angle properties were assessed in 21 female elite rhythmic gymnasts and 16 female age-matched athletes. Passive resistance to stretch was measured during knee extension with the hip fixed at 100° of flexion. Concentric isokinetic maximal voluntary knee flexion and extension torques were measured at 60°/s in the same position. Tests of flexibility and passive resistance to stretch indicated a greater flexibility in the gymnasts. Despite no differences between groups in knee flexion and extension peak torque, gymnasts reached knee flexion peak torque at more extended positions (longer muscle lengths) and displayed significantly different torque-angle relations. When active torque was corrected for passive resistance to stretch, differences increased, gymnasts producing more work, and maintaining  $\geq 70\%$  of peak torque over a larger range of joint excursion.

In conclusion, individuals with a higher flexibility of the hamstrings MTU present a different torque-angle profile, favoring the production of flexion torque toward extended knee positions, displaying larger functional range of motion and a higher mechanical work output during knee flexion.

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#### **KEYWORDS:**

Stretching; length-tension; passive resistance; passive stiffness; peak torque; range of motion

**54. POSTURE****Standing and LBP**

Clin J Pain. 2015 Jul;31(7):652-9. doi: 10.1097/AJP.000000000000148.

**Validity of a Paradigm for Low Back Pain Symptom Development During Prolonged Standing.**

Sorensen CJ<sup>1</sup>, Johnson MB, Callaghan JP, George SZ, Van Dillen LR.  
Author information

Abstract

**OBJECTIVES:**

Examine the validity of an induced pain paradigm in which people stand while performing simulated light work tasks (standing paradigm).

**MATERIALS AND METHODS:**

Initially, people with low back pain (LBP) reported the quality and location of their typical symptoms on a body pain diagram. Then, people with LBP and back-healthy people stood for 2 hours and reported the intensity, quality, and location of symptoms at baseline and every 15 minutes. Quality and location of typical symptoms of people with LBP were compared with their symptoms during standing. Back-healthy people were separated into pain developers (PDs) and nonpain developers. Symptom quality and location were compared between people with LBP and PDs.

**RESULTS:**

There were no differences in the quality and location of typical symptoms and symptoms during standing in people with LBP ( $P>0.05$ ). Three symptom descriptors were used by  $>30\%$  of people with LBP to describe typical symptoms. Only 2 people with LBP used these descriptors to describe typical symptoms but not during standing. There were no differences in the quality and location of symptoms reported in standing between people with LBP and PDs ( $P>0.05$ ). Four symptom descriptors were used by  $>30\%$  of participants with LBP during standing. There were no symptoms reported by PDs that were not reported by people with LBP.

**DISCUSSION:**

This study provides evidence that symptoms experienced during the standing paradigm are similar to symptoms experienced by people with LBP and, thus, provides support for the validity of the paradigm.

PMID: 25171636

**56. ATHLETICS****Exercise improves cognitive function**

Med Sci Sports Exerc. 2015 Jun 16.

**Cerebral/Peripheral Vascular Reactivity and Neurocognition in Middle-Age Athletes.**

Tarumi T<sup>1</sup>, Gonzales MM, Fallow B, Nualnim N, Lee J, Pyron M, Tanaka H, Haley AP.

Author information

Abstract

**INTRODUCTION:**

Midlife vascular disease risk is associated with higher incidence of cognitive impairment in late life. Regular aerobic exercise improves vascular function, which in turn may translate into better cognitive function. The purpose of this study was to determine the associations among cardiorespiratory fitness, cerebral and peripheral vascular reactivity, and cognitive function in the sedentary and endurance-trained middle-aged adults.

**METHODS:**

Thirty-two endurance-trained and 27 healthy sedentary participants aged 43-65 years underwent measurements of maximal oxygen uptake (VO<sub>2</sub>max), neurocognitive assessment, cerebrovascular reactivity to CO<sub>2</sub> (CVR), and brachial artery flow-mediated dilation (FMD).

**RESULTS:**

There were no group differences in age, sex, education level, fasting blood glucose, and blood pressure. Compared with sedentary subjects, endurance-trained athletes demonstrated better cognitive performance on memory (z-score:  $-0.36 \pm 1.11$  vs.  $0.30 \pm 0.76$ ,  $P < 0.01$ ), attention-executive function (z-score:  $-0.21 \pm 0.53$  vs.  $0.18 \pm 0.72$ ,  $P = 0.02$ ), and total cognitive composite scores (z-score:  $-0.27 \pm 0.63$  vs.  $0.23 \pm 0.57$ ,  $P < 0.01$ ). Furthermore, brachial FMD ( $4.70 \pm 2.50$  % vs.  $7.13 \pm 3.09$  %,  $P < 0.01$ ) and CVR ( $4.19 \pm 0.71$  %/mmHg vs.  $4.69 \pm 1.06$  %/mmHg,  $P = 0.052$ ) were greater in endurance-trained individuals than in the sedentary subjects. Total cognitive composite scores showed a significant positive association with brachial FMD ( $r = 0.36$ ,  $P < 0.01$ ) and CVR ( $r = 0.30$ ,  $P = 0.03$ ). Finally, when brachial FMD and CVR were entered as covariates, fitness-related group differences in total cognitive composite score were significantly attenuated (all  $P > 0.05$ ).

**CONCLUSION:**

Endurance-trained middle-aged adults demonstrated better cognitive performance which may, at least in part, be mediated by their enhanced vascular function, including cerebral and endothelial-dependent vascular reactivity.

PMID: 26083772

**57. GAIT****Turning mechanics**

J Biomech. 2015 Apr 13;48(6):1067-74. doi: 10.1016/j.jbiomech.2015.01.026. Epub 2015 Feb 2.

**Individual muscle contributions to circular turning mechanics.**

Ventura JD1, Klute GK2, Neptune RR3.

**Author information****Abstract**

Turning is an activity of daily living that involves both the acceleration of the body center-of-mass (COM) towards the center of curvature and rotation of the pelvis towards the new heading. The purpose of this study was to understand which muscles contribute to turning using experimentation, musculoskeletal modeling and simulation. Ten healthy adults consented to walk around a 1-m radius circular path at their self-selected walking speed and then along a straight line at the same speed. Forward dynamics simulations of the individual subjects during the turning and straight-line walking tasks were generated to identify the contributions of individual muscle groups to the body mediolateral and anterior-posterior COM acceleration impulse and to the pelvis angular acceleration impulse. The stance leg gluteus medius and ankle plantarflexor muscles and the swing leg adductor muscles were the primary contributors to redirect the body's COM relative to straight-line walking. In some cases, contributions to mediolateral COM acceleration were modulated through changes in leg orientation rather than through changes in muscle force. While modulation of the muscle contributions generally occurred in both the inner and outer legs, greater changes were observed during inner single-leg support than during outer single-leg support.

Total pelvis angular acceleration was minimal during the single-support phase, but the swing leg muscles contributed significantly to balancing the internal and external rotation of the pelvis. The understanding of which muscles contribute to turning the body during walking may help guide the development of more effective locomotor therapies for those with movement impairments. Copyright © 2015 Elsevier Ltd. All rights reserved.

**KEYWORDS:**

Biomechanics; Modeling; Muscle function; Simulation; Walking

**59. PAIN****Sleep and lunar cycles**

J Sleep Res. 2015 Jun 12. doi: 10.1111/jsr.12312.

**Effects of lunar phase on sleep in men and women in Surrey.**

Della Monica C<sup>1</sup>, Atzori G<sup>2</sup>, Dijk DJ<sup>1</sup>.

Author information

**Abstract**

Recently, evidence has emerged that the phases of the moon may modulate subjective sleep quality and polysomnographically assessed sleep structure in humans. We aimed to explore further the putative effects of circa-lunar periodicity (~29.5 days) on subjective and objective parameters of human sleep in a retrospective analysis. The baseline sleep recordings of 205 (91 males and 114 females; mean age = 47.47 years, standard deviation =19.01; range: 20-84 years) healthy and carefully screened participants who participated in two clinical trials in the Surrey Clinical Research Centre were included in the analyses. Sleep was recorded in windowless sleep laboratories. For each study night, we calculated the distance, in days, to the date of the closest full moon phase and based on this distance, classified sleep records in three lunar classes. Univariate analysis of variance with factors lunar class, age and sex was applied to each of 21 sleep parameters. No significant main effect for the factor lunar class was observed for any of the objective sleep parameters and subjective sleep quality but some significant interactions were observed. The interaction between lunar class and sex was significant for total sleep time, Stage 4 sleep and rapid eye movement (REM) sleep.

Separate analyses for men and women indicated that in women total sleep time, Stage 4 sleep and REM sleep were reduced when sleep occurred close to full moon, whereas in men REM duration increased around full moon. These data provide limited evidence for an effect of lunar phase on human sleep.

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**KEYWORDS:**

environmental cycles; rapid eye movement; sex differences; slow wave sleep; spectral analysis; total sleep time

PMID: 26096730

**Personality type and chest pain**

Eur J Pain. 2015 Jun 24. doi: 10.1002/ejp.743.

**Personality subtypes and chest pain in patients with nonobstructive coronary artery disease from the TweeSteden Mild Stenosis study: mediating effect of anxiety and depression.**

Mommersteeg PM<sup>1</sup>, Widdershoven JW<sup>1,2</sup>, Aarnoudse W<sup>2</sup>, Denollet J<sup>1</sup>.

Author information

Abstract

**BACKGROUND:**

Patients presenting with chest pain in nonobstructive coronary artery disease (CAD, luminal narrowing <60%) are at risk for emotional distress and future events. We aimed to examine the association of personality subtypes with persistent chest pain, and investigated the potential mediating effects of negative mood states.

**METHODS:**

Any chest pain in the past month was the primary outcome measure reported by 523 patients with nonobstructive CAD (mean age 61.4 years, SD = 9.4; 48% men), who participate in the TweeSteden Mild Stenosis (TWIST) observational cohort. Personality was categorized into a 'reference group', a high social inhibition ('SI only'), a high negative affectivity ('NA only') and a 'Type D' (NA and SI) group. Negative mood states included symptoms of depression and anxiety (Hospital Anxiety and Depression Scale) and cognitive and somatic depression (Beck Depression Inventory). The PROCESS macro was used to examine the relation between personality subtypes and chest pain presence, with the negative mood states as potential mediators.

**RESULTS:**

Persistent chest pain was present in 44% of the patients with nonobstructive CAD. Type D personality (OR = 1.91, 95% CI 1.24-2.95), but not the 'NA only' (OR = 1.48, 95% CI 0.89-2.44) or the 'SI only' (OR = 0.93, 95% CI 0.53-1.64) group was associated with chest pain, adjusted for age and sex. Negative mood states mediated the association between personality and chest pain.

**CONCLUSIONS:**

Type D personality, but not negative affectivity or social inhibition, was related to chest pain in nonobstructive CAD, which was mediated by negative mood states.

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PMID: 26105088

**Sleep and pain**

Eur J Pain. 2015 Jun 24. doi: 10.1002/ejp.741.

**Conditioned pain modulation is not decreased after partial sleep restriction.**

Matre D<sup>1</sup>, Andersen MR<sup>1</sup>, Knardahl S<sup>1</sup>, Nilsen KB<sup>1,2,3</sup>.

Author information

Abstract

**BACKGROUND:**

Sleep problems have been identified as a risk factor for several chronic pain conditions. Reduced sleep has been related to increased pain perception and it has been hypothesized that reduced pain inhibition may explain this. The aim of this study was to determine if sleep restriction (SR) affects heat pain perception and conditioned pain modulation (CPM).

**METHODS:**

In a paired cross-over design with two conditions (2 nights habitual sleep (HS) vs. 2 nights 50% SR) CPM was tested in 22 healthy individuals (14 women, 8 men). The test stimulus (TS) was 2-min contact heat stimulation ( $47 \pm 1.3$  °C) to the volar forearm. TS was delivered before and during a 7 °C cold pressor test (conditioning stimulus, CS) to the contralateral hand.

**RESULTS:**

TS was perceived as more painful after SR compared to after HS ( $p < 0.001$ ). A stronger inhibitory CPM was found after SR versus after HS ( $p < 0.001$ ).

**CONCLUSIONS:**

The results indicate that SR leads to increased heat pain perception, but not reduced inhibitory CPM. This contradicts general assumptions on the relation between SR and the CPM effect.

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PMID: 26104968

**60. COMPLEX REGIONAL PAIN****RNA**

J Pain. 2015 Jun 10. pii: S1526-5900(15)00700-2. doi: 10.1016/j.jpain.2015.05.008.

**Analgesic response to intravenous ketamine is linked to a circulating microRNA signature in female complex regional pain syndrome patients.**

Douglas SR<sup>1</sup>, Shenoda BB<sup>1</sup>, Qureshi RA<sup>2</sup>, Sacan A<sup>2</sup>, Alexander GM<sup>3</sup>, Perreault M<sup>3</sup>, Barrett JE<sup>1</sup>, Aradillas-Lopez E<sup>3</sup>, Schwartzman RJ<sup>3</sup>, Ajit SK<sup>4</sup>.

Author information

**Abstract**

Although ketamine is beneficial in treating complex regional pain syndrome (CRPS), a subset of patients respond poorly to therapy.

We investigated treatment-induced microRNA (miRNA) changes and their predictive validity in determining treatment outcome by assessing miRNA changes in whole blood from CRPS patients. Blood samples from female patients were collected before and after 5 days of intravenous ketamine administration. Seven patients were responders and six were poor responders. Differential miRNA expression was observed in whole blood before and after treatment. Additionally, 33 miRNAs differed between responders and poor responders prior to therapy, suggesting the predictive utility of miRNAs as biomarkers. Investigation of the mechanistic significance of hsa-miR-548d-5p downregulation in poor responders showed that this miRNA can down regulate UDP-glucuronyl transferase UGT1A1 mRNA. Poor responders had a higher conjugated/unconjugated bilirubin ratio indicating increased UGT1A1 activity. We propose that lower pretreatment levels of miR-548d-5p may result in higher UDP-GT activity, leading to higher levels of inactive glucuronide conjugates, thereby minimizing the therapeutic efficacy of ketamine in poor responders. Differences in miRNA signatures can provide molecular insights distinguishing responders from poor responders. Extending this approach to other treatment and outcome assessments might permit stratification of patients for maximal therapeutic outcome.

**Perspective** This study suggests the utility of circulating miRNAs as potential biomarkers. Assessing miRNA signatures before and after treatment demonstrated miRNA alterations from therapy; differences in miRNA signature in responders and poor responders prior to therapy indicate prognostic value. Mechanistic studies on altered miRNAs can provide new insights on disease.

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**KEYWORDS:**

MicroRNA; biomarker; complex regional pain syndrome; ketamine

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**62 A. NUTRITION/VITAMINS****Fruit and vegetable and CA**

Int J Cancer. 2015 Jun 15. doi: 10.1002/ijc.29640.

**Subtypes of fruit and vegetables, variety in consumption and risk of colon and rectal cancer in the European Prospective Investigation into Cancer and Nutrition.**

Leenders M<sup>1,2</sup>, Siersema PD<sup>2</sup>, Overvad K<sup>3,4</sup>, Tjønneland A<sup>5</sup>, Olsen A<sup>5</sup>, Boutron-Ruault MC<sup>6,7,8</sup>, Bastide N<sup>6,7,8</sup>, Fagherazzi G<sup>6,7,8</sup>, Katzke V<sup>9</sup>, Kühn T<sup>9</sup>, Boeing H<sup>10</sup>, Aleksandrova K<sup>10</sup>, Trichopoulou A<sup>11,12,13</sup>, Lagiou P<sup>12,13,14</sup>, Klinaki E<sup>11</sup>, Masala G<sup>15</sup>, Grioni S<sup>16</sup>, De Magistris MS<sup>17</sup>, Tumino R<sup>18</sup>, Ricceri F<sup>19</sup>, Peeters PH<sup>20</sup>, Lund E<sup>21</sup>, Skeie G<sup>21</sup>, Weiderpass E<sup>21,22,23,24</sup>, Quirós JR<sup>25</sup>, Agudo A<sup>26</sup>, Sánchez MJ<sup>27,28</sup>, Dorronsoro M<sup>28,29</sup>, Navarro C<sup>28,30,31</sup>, Ardanaz E<sup>28,32</sup>, Ohlsson B<sup>33</sup>, Jirström K<sup>34</sup>, Van Guelpen B<sup>35</sup>, Wennberg M<sup>36</sup>, Khaw KT<sup>37</sup>, Wareham N<sup>37,38</sup>, Key TJ<sup>39</sup>, Romieu I<sup>40</sup>, Huybrechts I<sup>40</sup>, Cross AJ<sup>41</sup>, Murphy N<sup>41</sup>, Riboli E<sup>41</sup>, Bueno-de-Mesquita HB<sup>2,41,42,43</sup>.

Author information

**Abstract**

Previously, a lower risk of colorectal cancer was observed with fruit and vegetable consumption in the European Prospective Investigation into Cancer and Nutrition within a follow-up period of nine years which was not fully supported by a recent meta-analysis. Therefore, we were interested in the relation with extended follow-up, also focusing on single subtypes and variety of intake of fruit and vegetables. Fruit and vegetable consumption was assessed at baseline. After an average of thirteen years of follow-up, 3,370 participants were diagnosed with colon or rectal cancer. Diet diversity scores were constructed to quantify variety in fruit and vegetable consumption. A lower risk of colon cancer was observed with higher self-reported consumption of fruit and vegetable combined (HR Q4 vs. Q1 0.87, 95%CI 0.75-1.01, P for trend 0.02), but no consistent association was observed for separate consumption of fruits and vegetables. No associations with risk of rectal cancer were observed. The few observed associations for some fruit and vegetable subtypes with colon cancer risk may have been due to chance. Variety in consumption of fruits and vegetables was not associated with a lower risk of colon or rectal cancer.

Although a lower risk of colon cancer is suggested with high consumption of fruit and vegetables, this study does not support a clear inverse association between fruit and vegetable consumption and colon or rectal cancer beyond a follow-up of more than ten years. Attenuation of the risk estimates from dietary changes over time cannot be excluded, but seems unlikely. This article is protected by copyright. All rights reserved.

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**KEYWORDS:**

Fruits and vegetables; colorectal cancer; variety

PMID: 26077137

**Vit D and muscle function**

Osteoporos Int. 2015 May 9.

**Effect of vitamin D supplementation alone on muscle function in postmenopausal women: a randomized, double-blind, placebo-controlled clinical trial.**

Cangussu LM<sup>1</sup>, Nahas-Neto J, Orsatti CL, Bueloni-Dias FN, Nahas EA.

Author information

**Abstract**

The present study investigates the effects of vitamin D on muscle function in postmenopausal women. It has been shown that vitamin D supplementation in postmenopausal women with hypovitaminosis D provides significant protective factor against sarcopenia, with significant increases in muscle strength and control of progressive loss of lean mass.

**INTRODUCTION:**

We aimed to evaluate the effect of supplementation of vitamin D (VITD) alone on muscle function in younger postmenopausal women.

**METHODS:**

In this double-blind, placebo-controlled clinical trial, 160 Brazilian postmenopausal women were randomized into two groups: VITD group consisting of patients receiving vitamin D<sub>3</sub> 1000 IU/day orally (n = 80) or placebo group (n = 80). Women with amenorrhea for more than 12 months and age 50-65 years, with a history of falls (previous 12 months), were included. The intervention time was 9 months, with assessments at two points, start and end. Lean mass was estimated by total-body dual-energy X-ray absorptiometry (DXA) and muscle strength by handgrip strength and chair rising test. The plasma concentrations of 25-hydroxyvitamin D [25(OH)D] were measured by high-performance liquid chromatography (HPLC). Statistical analysis was by intention to treat (ITT), using ANOVA, Student's t test, and Tukey's test.

**RESULTS:**

After 9 months, average values of 25(OH)D increased from  $15.0 \pm 7.5$  to  $27.5 \pm 10.4$  ng/ml (+45.4 %) in the VITD group and decreased from  $16.9 \pm 6.7$  to  $13.8 \pm 6.0$  ng/ml (-18.5 %) in the placebo group ( $p < 0.001$ ). In the VITD group, there was significant increase in muscle strength (+25.3 %) of the lower limbs by chair rising test ( $p = 0.036$ ). In women in the placebo group, there was considerable loss (-6.8 %) in the lean mass ( $p = 0.030$ ).

**CONCLUSION:**

The supplementation of vitamin D alone in postmenopausal women provided significant protective factor against the occurrence of sarcopenia, with significant increases in muscle strength and control of progressive loss of lean mass.

PMID: 25956283

**Vit. D and osteoporosis**

Osteoporos Int. 2015 Jun 24.

**Spectacular improvement in vitamin D status in elderly osteoporotic women: 8-year analysis of an osteoporotic population treated in a dedicated fracture liaison service.**

Amouzougan A<sup>1</sup>, Deygat A, Trombert B, Constant E, Denarié D, Marotte H, Thomas T.

Author information

**Abstract**

In a population of postmenopausal women with a fragility fracture, we found a drastic reduction in the proportion of women with severe (<25 nmol/L) and moderate (25 to 75 nmol/L) hypovitaminosis D, especially from 2009 onwards. These results show that supplementation has been very widely integrated into current practice.

**INTRODUCTION:**

Vitamin D (25(OH)D) is essential for bone health. In institutionalised osteoporotic women, it reduces the risk of fragility fractures. Numerous articles suggesting the possibility of extraosseous effects have generated a growing number of publications and recommendations on more widespread administration, to limit the risks of moderate or severe hypovitaminosis D. We assessed the impact on clinical practice of these recommendations concerning 25(OH)D supplementation in elderly at-risk populations.

**METHODS:**

A total of 1486 postmenopausal osteoporotic women were seen in the context of a fracture liaison service (i.e. a rheumatology consultation following a peripheral fragility fracture), between May 2005 and December 2012. Of these, 1107 had a 25(OH)D assay (femur, n = 520; humerus, n = 207; wrist, n = 380).

**RESULTS:**

The average age of the total population was  $76.7 \pm 9.9$  years, while for women with an available 25(OH)D assay, the average age was  $75.1 \pm 11.8$  years. The average 25(OH)D (nmol/L) level was similar for the three fracture sites: femur,  $30 \pm 36.2$ ; humerus,  $27.5 \pm 24$ ; and wrist,  $31 \pm 26$ . A drastic reduction in the proportion of women with severe (<25 nmol/L) and moderate (25 to 75 nmol/L) hypovitaminosis D was observed, especially from 2009 onwards, with a mean prevalence of 69 and 30 % respectively before that year and 35 and 52 % thereafter. Conversely, the proportion of women with 25(OH)D at the threshold value of 75 nmol/L increased from 1.2 to 24 %. Overall, mean serum 25(OH)D levels were significantly higher when comparing the two periods 2005-2008 and 2009-1012 ( $17.6 \pm 14.6$  and  $48.4 \pm 39.2$  nmol/L, respectively;  $p < 0.0001$ ).

**CONCLUSION:**

These results show that supplementation has been very widely integrated into current practice. We can expect it to yield beneficial effects in osseous and extraosseous terms in osteoporotic women, particularly the very elderly.

PMID: 26104797

### 63. PHARMACOLOGY

#### Previous drug usage and addiction to pain killers

Addict Behav. 2015 Jun 10;50:22-27. doi: 10.1016/j.addbeh.2015.06.006.

#### **Prescription pain reliever misuse prevalence, correlates, and origin of possession throughout the life course.**

Mowbray O<sup>1</sup>, Quinn A<sup>2</sup>.  
Author information

Abstract

#### **INTRODUCTION:**

While a considerable amount of information is available concerning who is most likely to engage in prescription pain reliever misuse, few studies have examined whether the correlates of pain reliever misuse and sources of pain reliever possession are consistent across the life span.

#### **METHODS:**

Data from the 2011-2012 National Survey in Drug Use and Health (NSDUH). Multivariate logistic regression examined clinical and social correlates of past-year pain reliever misuse, stratified by age. Additionally, bivariate analyses examined sources of pain reliever possession, and whether these origins differ by age.

#### **RESULTS:**

Among respondents, 4.7% reported past-year prescription pain reliever misuse. Prevalence for individuals aged 12 to 17 was 5.9%, 18 to 25 was 10.2%, 26-34 was 7.7%, 35 to 49 was 4.3%, and individuals aged 50 or older was 1.7%. While many social and clinical correlates of pain reliever misuse emerged among younger respondents, these correlates diminished in significance among older adults. Only past-year illicit drug use disorders (marijuana, cocaine, crack cocaine, heroin, and hallucinogen use) was a significant predictor of pain reliever misuse among all age groups. Also, older adults were more likely to report pain reliever possession from multiple medical doctors, whereas younger individuals were more likely to possess pain reliever from friends/relatives or through purchase from a drug dealer/stranger.

#### **CONCLUSIONS:**

Increased efforts to better screen for illicit drug use and greater efforts to coordinate patient prescription records among medical care providers may be high priorities in developing interventions to reduce rates of misuse of prescription pain relievers, especially among older adults.

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#### **KEYWORDS:**

Age groups; National survey of drug use and health; Pain reliever misuse

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