Pregnancy


Does antenatal physical therapy for pregnant women with low back pain or pelvic pain improve functional outcomes? A systematic review.

Richards E, van Kessel G, Virgara R, Harris P.

Source
School of Health Sciences, University of South Australia, Adelaide and The Lyell McEwin Hospital, Adelaide, South Australia, Australia.

Abstract
Objective. A systematic review was undertaken to update the understanding of the available evidence for antenatal physical therapy interventions for low back or pelvic pain in pregnant women to improve functional outcomes when compared to other treatments or no treatment. Data Sources. Seven electronic databases were systematically searched and supplemented by hand searching through reference lists. Methods of study selection. Two reviewers independently selected trials for inclusion and independently assessed the internal validity of the included trials using the Clinical Appraisal Skills Program (CASP) tool. Results. Four trials with 566 participants were identified that met the inclusion criteria. The validity of the trials was moderate. Exercise, pelvic support garments and acupuncture were found to improve functional outcomes in pregnant women with low back or pelvic pain. No meta-analysis was performed because of the heterogeneity of functional outcome measures. Conclusions. While there is some evidence that physical therapy utilizing exercise, acupuncture and pelvic supports may be useful, further research needs to consider other treatment modalities used by physical therapists and establish an appropriate, reliable and valid functional outcome measure to assess low back and pelvic pain in pregnancy.

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Treatment and ergonomics training of work-related lower back pain and body posture problems for nurses.

Jaromi M, Nemeth A, Kranicz J, Laczko T, Betlehem J.

Source

Authors: Melinda Jaromi, MSc, Physiotherapist and Senior Lecturer, Institute of Physiotherapy, Faculty of Health Sciences; Andrea Nemeth, BSc, Physiotherapist and Trainee, Institute of Physiotherapy, Faculty of Health Sciences; Janos Kranicz, MD, PhD, Head of the Department, Institute of Physiotherapy, Faculty of Health Sciences; Tamas Laczko, MSc, PhD, Senior Lecturer, Institute of Health Insurance, Faculty of Health Sciences; Jozsef Betlehem, RN, MNS, MEd, PhD, EMT, Associate Professor and Head of Institute of Nursing and Patient Care, Faculty of Health Sciences, University of Pecs, Pecs, Hungary.

Abstract

Aims. The purpose of the study was to measure the effectiveness of a spine training programme (Back School) in nurses who have been living with chronic low back pain. It was hypothesised that active therapy, ergonomics and education called Back School will significantly decrease the pain intensity levels and improve the body posture of the study participants. Background. A chronic low back pain is a significant work-related health problem among healthcare workers around the world. Proper body posture is essential for decreasing pain in healthcare workers who have history of chronic low back pain. By teaching proper body posture and with the creation of occupational settings that are 'spine-friendly' hospitals and other healthcare settings can significantly lower the suffering of their nursing staff. Design. Single-blinded randomised controlled trial was utilised with six- and 12-months follow-up. Methods. The study was carried out at the University of Pecs, Faculty of Health Sciences from 2007 to 2008 involving 124 nurses with low back pain. Participants were randomly assigned to the study group (who have received ergonomics training and education called Back School) with an intervention conducted once a week for a six-week period. The control group received passive physiotherapy once a week for a six-week period. Further follow-up measurements were conducted at six and 12 months, respectively. The study variables and outcome measures were pain intensity and body posture (angle of thoracic kyphosis and lumbar lordosis). The pain intensity was investigated with the Visual Analogue Scale. Body posture was recorded and analysed with the Zebris biomechanical motion analysis system. Results. The statistical analysis of repeated measures indicated a significant decrease in back pain intensity after the therapy in both groups, compared with measurements before the therapy; however, the BS group showed significantly better results during the six-month and one-year follow-up period. The biomechanical analysis of postures after the therapy in the BS group showed significant improvements over the control group; during the follow-up, the difference was still significant, yet slightly reduced. Conclusions. This study has shown that a significant reduction in the pain intensity and improvement in body posture can be achieved by the usage of the active physical therapy methods (Back School) in nurses who are experiencing chronic lower back pain. Relevance to clinical practice. The Back School programme when compared with the passive physical therapies (such as massage, ultrasound treatment, etc.) shows significant improvement in reduction in pain and greatly improves the posture of healthcare workers. The adoption of the Back School programme for the treatment of the healthcare workers with chronic low back problems should be a treatment of choice and standard that should be adopted when designing occupational healthcare policies and procedures.

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Gender differences in both active and passive parts of the plantar flexors series elastic component stiffness and geometrical parameters of the muscle-tendon complex.

Fouré A, Cornu C, McNair PJ, Nordez A.

Source
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Abstract
Men are reportedly at higher risk of plantar flexor muscle injury and Achilles tendon ruptures than women. Biomechanical parameters are thought to play a role in the higher frequency of injury to males. One parameter is the stiffness of tissues; a stiff tissue cannot absorb sufficient energy with loading, and subsequently may be more likely to be injured. Thus, our purpose was to investigate the gender difference in the geometrical parameters of plantar flexor's muscle-tendon complex and the stiffness of both active and passive parts of the series elastic component (S(SEC1) and S(SEC2), respectively). Using the alpha method on data obtained from quick stretches to the plantar flexors performed during isometric contractions, S(SEC1) and S(SEC2) were assessed. Plantar flexor muscles and Achilles tendon cross-sectional areas (CSA(TS) and CSA(AT), respectively) were determined in young healthy men (n = 49) and women (n = 31). The findings showed that S(SEC2) was higher in men (p < 0.001), but this difference was not apparent when S(SEC2) was normalized to CSA(AT) (p > 0.05). In contrast, S(SEC1) was lower in men (p < 0.001) and remained so after normalization to CSA(TS). Higher joint stiffness observed in men was notably influenced by lever arm length. Thus, the results of this study have implications for performance and injury.

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Effect of locomotor training on muscle performance in the context of nerve-muscle communication dysfunction.

Hadj-Saïd W, Bangratz M, Vignaud A, Chatonnet A, Butler-Browne G, Nicole S, Agbulut O, Ferry A.

Source
Université Pierre et Marie Curie-Paris, UMR-S974, Paris F-75013, France.

Abstract
INTRODUCTION:
The effects of locomotor training (LT) on skeletal muscle after peripheral nerve injury and acetylcholinesterase deficiency are not well documented.

METHODS:
We determined the effects of LT on mouse soleus muscle performance after sciatic nerve transection with excision (full and permanent denervation), nerve transection (partial functional reinnervation), nerve crush (full denervation with full functional reinnervation), and acetylcholinesterase deficiency (alteration in neuromuscular junction functioning).

RESULTS:
We found no significant effect of LT on the recovery of soleus muscle weight, maximal force in response to muscle stimulation, and fatigue resistance after nerve transection with or without excision. However, LT significantly increased soleus muscle fatigue resistance after nerve crush and acetylcholinesterase deficiency. Moreover, hindlimb immobilization significantly aggravated the deficit in soleus muscle maximal force production and atrophy after nerve crush.

CONCLUSIONS:
LT is beneficial, and reduced muscle use is detrimental for intrinsic muscle performance in the context of disturbed nerve-muscle communication.

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PMID: 22431091 [PubMed - indexed for MEDLINE]
A literature review reveals that trials evaluating treatment of non-specific low back pain use inconsistent criteria to identify serious pathologies and nerve root involvement

**Authors:** Williams, Ciaran; Hancock, Mark J; Ferreira, Manuela; Ferreira, Paulo; Maher, Chris G  
**Source:** *Journal of Manual & Manipulative Therapy*, Volume 20, Number 2, 2012 , pp. 59-65(7)

**Abstract:**

**Objectives**

The broad aim of this study was to assess the homogeneity of patients included in trials of non-specific low back pain (NSLBP). To do this, we investigated the consistency and clarity of criteria used to identify and exclude participants with serious pathologies and nerve root compromise in randomized controlled trials, investigating interventions for NSLBP.

**Methods**

We searched Medline database for randomized controlled trials of low back pain (LBP), published between 2000 and 2009. We then randomly selected and screened trials for inclusion until we had 50 eligible trials. Data were extracted on the criteria used to identify cases of serious conditions (e.g. cancer, fracture) and nerve root involvement.

**Results**

The majority of papers (35/50) explicitly excluded patients with serious pathology. However, the terminology used and examples given were highly variable. Nerve root involvement was an exclusion criterion in the majority but not all studies. The criteria used for excluding patients with nerve root involvement varied greatly between studies. The most common criteria were ‘motor, sensory or reflex changes’ (nine studies), followed by ‘pain radiating below the knee’ (five studies) and ‘reduced straight leg raise which reproduces leg pain’ (five studies). In half of the included studies, the criteria used, while alluding to nerve root involvement, were not explained adequately for us to determine the types of patients included or excluded.

**Discussion**

The inconsistent and unclear criteria used to identify cases of serious pathology and nerve root compromise means that published trials of LBP likely include heterogeneous patient populations. This trait limits our ability to make comparisons across trials or pool studies. Standardization and consensus is important for future research.
Abstract

Study Design. Follow-up study.

Objective. To study whether neck muscle strength or cervical spine mobility values could serve as predictors for future neck pain among originally pain-free working-age subjects during a long period.

Summary of Background Data. Neck pain has been associated with weaker neck muscle strength and lower cervical spine mobility in several studies. However, causality between physical capacity and neck pain has not been shown.

Methods. Isometric neck muscle strength and passive range of motion of the cervical spine of 220 healthy female volunteers, aged 20 to 59 years, were measured. A postal survey was conducted 6 years later to determine whether any volunteers had experienced neck pain. The receiver operator characteristics curve was used to study how well the neck strength and mobility values in different movement planes at baseline served as predictors of future neck pain.

Results. Of the 192 (87%) responders, 37 (19%) reported neck pain for 7 days during the past year. In predicting neck pain, areas under the receiver operator characteristics curves (95% confidence intervals) in different movement planes were 0.52 to 0.56 (0.41–0.66) for isometric neck strength and 0.54 to 0.56 (0.44–0.76) for passive mobility of the cervical spine.

Conclusion. The results suggest that neither isometric neck muscle strength nor passive mobility of cervical spine has predictive value for later occurrences of neck pain in pain-free working-age women. Thus, screening healthy subjects for weaker neck muscle strength or decreased mobility of the cervical spine may not be recommended for preventive purposes.
Can a functional postural exercise improve performance in the cranio-cervical flexion test? – A preliminary study

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Centre of Clinical Research Excellence in Spinal Pain, Injury and Health and Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, St. Lucia, Queensland 4072, Australia

Abstract
Deep cervical flexor (DCF) muscle impairment is common in patients with neck pain. Retraining function is often commenced with a motor relearning approach, requiring the patient to practice and hold a cranio-cervical flexion position in supine lying. Motor relearning requires multiple repetitions which is difficult to achieve if only exercising in supine. This preliminary study investigated the effects of training the DCF with a functional exercise: assumption of an upright lumbo-pelvic and spinal postural position, adding a neck lengthening manoeuvre. The exercise effect was evaluated by changes in sternocleidomastoid (SCM) muscle activity in the cranio-cervical flexion test (CCFT). Twenty subjects with neck pain were randomly assigned to an exercise or control group. The exercise group trained for two weeks. Pre and post-intervention, electromyographic (EMG) signals were recorded from the SCM muscles during the five stages of the CCFT. Results indicated that the exercise improved performance. SCM EMG signal amplitudes decreased across all CCFT stages, albeit significant only at the first and third stages of the test; 22 mmHg ($p = 0.043$) and 26 mmHg ($p = 0.003$). No differences were evident in the control group (all $p > 0.05$). There was no difference between groups for pain and disability measures. This initial study indicates that a postural exercise, convenient to perform during the working day, improves the pattern of SCM muscle activity in the CCFT. Whilst further research is necessary, these observations suggest the worth of such an exercise to augment other training in the rehabilitation of patients with neck pain.
Comparison of hip rotation range of motion in judo athletes with and without history of low back pain

Gabriel Peixoto Leão Almeida, Vivian Lima de Souza, Saulo Sdao Sano, Michele Forgiarini Saccol, Moisés Cohen

Abstract
This study compared hip rotation range of motion in judo athletes with and without a history of low back pain. Forty-two athletes (22 males) were divided into two groups: 21 with history of low back pain (HLBP) and 21 without history of low back pain (Control). Internal and external hip rotation range of motion in active and passive movement were measured using computed photogrammetry. The HLBP group exhibited a significant reduction in active internal rotation (27.5 ± 6.5° vs 38.2 ± 6.5°), active total rotation (80.1 ± 9.5° vs 87.4 ± 7.9°) of the non-dominant limb (P < 0.01) and active total rotation (82.6 ± 7.6° vs 87.6 ± 9.8°; P = 0.04) in comparison with the control group. In passive rotation, the HLBP group showed a significant reduction in internal rotation of the dominant (41.9 ± 6.1° vs 46.1 ± 8.4°; P = 0.04) and non-dominant limb (37.1 ± 8.4° vs 47.3 ± 7.6°; P < 0.001), total rotation of the non-dominant limb (96.7 ± 10.2° vs 105.1 ± 11°; P = 0.005) and total rotation (98.5 ± 9.2° vs 105 ± 11.2°; P = 0.02). Within the HLBP group, a significant reduction in both active and passive internal rotation (P < 0.001) and active and passive total rotation (P < 0.01) of the non-dominant limb was detected. The same was not found in the control group. The results demonstrate that judo athletes with a history of low back pain exhibit deficits in hip rotation and greater asymmetry between limbs.
Cervical Spine
Clinical Outcomes of Cervical Radiculopathy Following Epidural Steroid Injection: A Prospective Study With Follow-up for More Than 2 Years
Lee, Sang-Hun MD; Kim, Ki-Tack MD; Kim, Dong-Hwan MD; Lee, Bong-Jae MD; Son, Eun-Seok MD; Kwack, Yoon-Ho MD

Abstract
Study Design. A prospective clinical outcome study.

Objective. To analyze clinical outcome and prognostic factors of the epidural steroid injection (ESI) for cervical radiculopathy (CR) patients who were considered surgical candidates.

Summary of Background Data. The clinical outcomes and prognostic factors of ESI for CR have not been consistently reported, and there has been no prospective study with long-term follow-up.

Methods. ESI was administered in 98 patients (mean age = 50.1 yr, follow-up = 40.4 mo) with CR without major neurological deficit. A total of 3 or fewer ESIs were administered, using either the interlaminar or transforaminal technique. The patients were divided into 2 groups: those who did not have surgery and those who underwent surgery at the last follow-up. We analyzed statistical difference of relevant clinical (sex, age, duration of symptom, previous episode of CR, visual analogue scale [VAS] of arm pain, etc.), radiological factors (soft disc vs. hard disc, central disc vs. foraminal disc, single segment involvement vs. multiple segment involvement, degree of neural compression and degeneration, etc.) and clinical outcomes (VAS of arm pain, Odom's criteria, and neck disability index) between the 2 groups.

Results. The patients received mean 1.8 ESI treatments. At the final follow-up, 79 of the patients (80.6%) did not undergo surgery, whereas the other 19 patients (19.4%) underwent surgery. Of the clinical factors, recurred CR (15.2% vs. 42.1%, P = 0.022) and mean VAS score of arm pain before (6.1 vs. 8.2, P = 0.000) and after ESI (2.8 vs. 6.9, P = 0.000) were significantly different between both groups. Radiological factors and outcome parameters showed no significant difference.

Conclusion. In more than 80% of patients with CR who were surgical candidates, surgery was avoided using ESI. The significant factors predisposing failure of ESI were intensity of symptom and a previous episode of CR. ESI is therefore considered a safe and effective treatment to choose before undergoing surgery.
A Randomized Controlled Trial on the Effectiveness of a Classification-Based System for Sub-acute and Chronic Low Back Pain

Apeldoorn, Adri T; Ostelo, Raymond W; van Helvoirt, Hans; Fritz, Julie M; Knol, Dirk L; van Tulder, Maurits W; de Vet, Henrica CW

Published Ahead-of-Print

Abstract

Study Design. A randomized controlled trial.

Objective. To assess the effectiveness of Delitto's classification-based treatment approach compared to usual physical therapy care in patients with sub-acute or chronic low back pain (LBP).

Summary and Background. No trial has evaluated this approach in patients with sub-acute and chronic LBP.

Methods. Before randomization, all patients were classified by research physical therapists according to a modified version of Delitto's classification-based system. Randomization was computer-generated, with centralized allocation concealment. The statistician and the physical therapists were unblinded. Patients and assistants who collected follow-up questionnaires were blinded. Follow-up assessments were completed at 8, 26, and 52 weeks. The primary analysis was performed according to the intention-to-treat principle, using multilevel analysis. The main outcomes were global perceived effect (GPE), disability (Oswestry Disability Index [ODI], 0-100) and pain intensity (Numerical Rating Scale [NRS], 0-10). Secondary outcomes were quality of life, fear-avoidance beliefs and psychosocial status.

Results. A total of 156 patients were included (classification-based group n = 74; usual physical therapy group n = 82). There were no statistically significant differences between the treatment groups for any of the outcomes at any of the follow-up time points. After 8 weeks, patients in the classification-based group had greater GPE scores; adjusted OR of 1.01 (95% CI 0.31 to 3.28), and higher adjusted ODI and NRS scores; mean adjusted differences of 0.48 points (95% CI -4.59 to 3.63) and 0.49 points (95% CI -1.34 to 0.37) respectively, but all differences were statistically non-significant.

Conclusion. The classification-based system as used in this study was not effective for improving physical therapy care outcomes in a population of patients with sub-acute and chronic LBP.

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Core muscles

Spine:

Effect of Core Stability Exercises on Feedforward Activation of Deep Abdominal Muscles in Chronic Low Back Pain: A Randomized Controlled Trial

Vasseljen, Ottar PhD, PT; Unsgaard-Tøndel, Monica MSc, PT; Westad, Christian PhD; Mork, Paul Jarle PhD

Study Design. Randomized controlled trial.

Objective. To investigate feedforward activation or timing of abdominal muscle activation in response to rapid shoulder flexion after 8 weeks with core stability exercises, sling exercises, or general exercises in patients with chronic nonspecific low back pain (LBP).

Summary of Background Data. Delayed onset in abdominal muscles has been associated with LBP. Low load exercises to volitionally activate the transversus abdominis were introduced to restore trunk muscle activation deficits. More forceful co-contraction exercises have been advocated by others. This study explored if abdominal muscle onset changed after low load core stability exercises, high load sling exercises, or general exercises.

Methods. Subjects (N = 109) with chronic nonspecific LBP of at least three months duration were randomly assigned to 8 weekly treatments with low load core stability exercises, high load stabilizing exercises in slings, or general exercises in groups. Primary outcome was onset recorded bilaterally by m-mode ultrasound imaging in the deep abdominal muscles in response to rapid shoulder flexion.

Results. No or small changes were found in onset after treatment. Baseline-adjusted between group differences showed a 15 ms (95% CI, 1-28, P = 0.03) and a 19 ms (95% CI, 5-33, P<0.01) improvement with sling relative to core stability and general exercises, respectively, but on one side only. There was no association between changes in pain and onset over the intervention period (R2<=0.02).

Conclusion. Abdominal muscle onset was largely unaffected by 8 weeks of exercises in patients with chronic LBP. There was no association between change in onset and LBP. Large individual variations in activation pattern of the deep abdominal muscles may justify exploration of differential effects in subgroups of LBP.

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Abdominals

Spine:

Architectural Analysis of Human Abdominal Wall Muscles: Implications for Mechanical Function

Brown, Stephen H. M. PhD; Ward, Samuel R. PhD; Cook, Mark S. PhD; Lieber, Richard L. PhD
Published Ahead-of-Print


Objective. To quantify the architectural properties of rectus abdominis (RA), external oblique (EO), internal oblique (IO), and transverse abdominis (TrA), and model mechanical function in light of these new data.

Summary of Background Data. Knowledge of muscle architecture provides the structural basis for predicting muscle function. Abdominal muscles greatly affect spine loading, stability, injury prevention, and rehabilitation; however, their architectural properties are unknown.

Methods. Abdominal muscles from 11 elderly human cadavers were removed intact, separated into regions, and microdissected for quantification of physiologic cross-sectional area, fascicle length, and sarcomere length. From these data, sarcomere operating length ranges were calculated.

Results. IO had the largest physiologic cross-sectional area and RA the smallest, and would thus generate the largest and smallest isometric forces, respectively. RA had the longest fascicle length, followed by EO, and would thus be capable of generating force over the widest range of lengths. Measured sarcomere lengths, in the postmortem neutral spine posture, were significantly longer in RA and EO (3.29 +/- 0.07 and 3.18 +/- 0.11 [mu]m) compared to IO and TrA (2.61 +/- 0.06 and 2.58 +/- 0.05 [mu]m) (P < 0.0001). Biomechanical modeling predicted that RA, EO and TrA act at optimal force-generating length in the midrange of lumbar spine flexion, where IO can generate approximately 90% of its maximum force.

Conclusion. These data provide clinically relevant insights into the ability of the abdominal wall muscles to generate force and change length throughout the lumbar spine range of motion. This will impact the understanding of potential postures in which the force-generating and spine stabilizing ability of these muscles become compromised, which can guide exercise/rehabilitation development and prescription. Future work should explore the mechanical interactions among these muscles and their relationship to spine health and function.

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SYNOPSIS: The validity of upper-limb neurodynamic tests (ULNTs) for detecting peripheral neuropathic pain (PNP) was assessed by reviewing the evidence on plausibility, the definition of a positive test, reliability, and concurrent validity. Evidence was identified by a structured search for peer-reviewed articles published in English before May 2011. The quality of concurrent validity studies was assessed with the Quality Assessment of Diagnostic Accuracy Studies tool, where appropriate. Biomechanical and experimental pain data support the plausibility of ULNTs. Evidence suggests that a positive ULNT should at least partially reproduce the patient's symptoms and that structural differentiation should change these symptoms. Data indicate that this definition of a positive ULNT is reliable when used clinically. Limited evidence suggests that the median nerve test, but not the radial nerve test, helps determine whether a patient has cervical radiculopathy. The median nerve test does not help diagnose carpal tunnel syndrome. These findings should be interpreted cautiously, because diagnostic accuracy might have been distorted by the investigators' definitions of a positive ULNT. Furthermore, patients with PNP who presented with increased nerve mechanosensitivity rather than conduction loss might have been incorrectly classified by electrophysiological reference standards as not having PNP. The only evidence for concurrent validity of the ulnar nerve test was a case study on cubital tunnel syndrome. We recommend that researchers develop more comprehensive reference standards for PNP to accurately assess the concurrent validity of ULNTs and continue investigating the predictive validity of ULNTs for prognosis or treatment response.

Shoulder/depression

Effect of depressive symptoms on perceived disability in patients with chronic shoulder pain

Archives of Orthopaedic and Trauma Surgery, 05/25/2012

Roh YH et al. – Degrees of depressive symptoms were found to be significantly associated with higher symptom scores and greater disability in patients with chronic shoulder pain. Although a large proportion of perceived disability remains unexplained, perceived disability in patients with chronic shoulder pain was found to be strongly influenced by depressive symptoms.

Background
Psychological distress may be an important determinant of perceived disability in patients with chronic musculoskeletal disorders. We evaluated the relationship between depressive symptoms and perceived disability in patients with chronic shoulder pain and quantified the contribution made by depression to perceived disability.

Methods
In this prospective study, 109 patients with chronic shoulder pain caused by degenerative or inflammatory disorders were evaluated using the Disability of Arm, Shoulder and Hand (DASH) questionnaire and the Center for Epidemiologic Studies-Depression (CES-D) Scale to determine relationships between depressive symptoms and perceived disability in patients with chronic shoulder pain. In addition, pain scores were evaluated using a visual analog scale (VAS) during activity, and range of motion (ROM) and abduction strength (strength) measurements were measured. Multivariate analyses of variance and regression modeling were used to assess the relative contributions made by depressive symptoms (CES-D) and other clinical parameters to patient-perceived disability (DASH).

Results
DASH scores were found to be moderately correlated (0.3 < $r$ < 0.6) with ROM, strength, pain VAS and CES-D; DASH scores were more strongly correlated with CES-D scores than with pain VAS scores or range of motion ($r = 0.58; p < 0.001$, $0.37; p < 0.001$, $0.32; p = 0.04$ respectively). Multiple stepwise regression analyses revealed that gender, ROM, pain VAS and CES-D scores independently predicted DASH score and accounted for 43 % of the variance. CES-D score was found to be the strongest predictor of DASH score and accounted for 23 % of the variance.

Conclusions
Degrees of depressive symptoms were found to be significantly associated with higher symptom scores and greater disability in patients with chronic shoulder pain. Although a large proportion of perceived disability remains unexplained, perceived disability in patients with chronic shoulder pain was found to be strongly influenced by depressive symptoms.

Type of study/level of evidence
Safety of cervical spine manipulation: are adverse events preventable and are manipulations being performed appropriately? A review of 134 case reports

Authors: Puentedura, Emilio J; March, Jessica; Anders, Joe; Perez, Amber; Landers, Merrill R; Wallmann, Harvey W; Cleland, Joshua A

Source: Journal of Manual & Manipulative Therapy, Volume 20, Number 2, 2012, pp. 66-74(9)

To retrospectively analyze all available documented case reports in the literature describing patients who had experienced severe adverse events (AEs) after receiving CSM to determine if the CSM was used appropriately, and if these types of AEs could have been prevented using sound clinical reasoning on the part of the clinician.

Data sources

PubMed and the Cumulative Index to Nursing and Allied Health were systematically searched for case reports between 1950 and 2010 of AEs following CSM.

Study selection

Case reports were included if they were peer-reviewed; published between 1950 and 2010; case reports or case series; and had CSM as an intervention. Articles were excluded if the AE occurred without CSM (e.g. spontaneous); they were systematic or literature reviews. Data extracted from each case report included: gender; age; who performed the CSM and why; presence of contraindications; the number of manipulation interventions performed; initial symptoms experienced after the CSM; and type of resultant AE.

Data synthesis

Based on the information gathered, CSMs were categorized as appropriate or inappropriate, and AEs were categorized as preventable, unpreventable, or unknown. Chi-square analysis with an alpha level of 0.05 was used to determine if there was a difference in proportion between six categories: appropriate/preventable, appropriate/unpreventable, appropriate/unknown, inappropriate/preventable, inappropriate/unpreventable, and inappropriate/unknown.

Results

One hundred thirty four cases, reported in 93 case reports, were reviewed. There was no significant difference in proportions between appropriateness and preventability, $P = .46$. Of the 134 cases, 60 (44.8%) were categorized as preventable, 14 (10.4%) were unpreventable and 60 (44.8%) were categorized as ‘unknown’. CSM was performed appropriately in 80.6% of cases. Death resulted in 5.2% (n = 7) of the cases, mostly caused by arterial dissection.

Limitations

There may have been discrepancies between what was reported in the cases and what actually occurred, since physicians dealing with the effects of the AE, rather than the clinician performing the CSM, published many of the cases.

Conclusions

This review showed that, if all contraindications and red flags were ruled out, there was potential for a clinician to prevent 44.8% of AEs associated with CSM. Additionally, 10.4% of the events were unpreventable, suggesting some inherent risk associated with CSM even after a thorough exam and proper clinical reasoning.
Supervised Exercise With and Without Spinal Manipulation Performs Similarly and Better Than Home Exercise for Chronic Neck Pain: A Randomized Controlled Trial

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Study Design. Randomized controlled trial using mixed methods.

Objective. To evaluate the relative effectiveness of high-dose supervised exercise with and without spinal manipulation and low-dose home exercise for chronic neck pain.

Summary of Background Data. Neck pain is a common global health care complaint with considerable social and economic impact. Systematic reviews have found exercise therapy (ET) to be effective for neck pain, either alone or in combination with spinal manipulation. However, it is unclear to what extent spinal manipulation adds to supervised exercise or how supervised high-dose exercise compares with low-dose home exercise.

Methods. Two hundred and seventy patients with chronic neck pain were studied at an outpatient clinic. Patients were randomly assigned one of the following interventions: (1) high-dose supervised strengthening exercise with spinal manipulation (exercise therapy combined with spinal manipulation therapy [ET + SMT]), (2) high-dose supervised strengthening exercise (ET) alone, or (3) low-dose home exercise and advice (HEA). The primary outcome was patient-rated pain at baseline and at 4, 12, 26, and 52 weeks. Secondary measures were disability, health status, global perceived effect, medication use, and satisfaction.

Results. At 12 weeks, there was a significant difference in patient-rated pain between ET + SMT and HEA (1.3 points, \( P < 0.001 \)) and ET and HEA (1.1 points, \( P = 0.001 \)). Although there were smaller group differences in patient-rated pain at 52 weeks (ET + SMT vs. HEA, 0.2 points, \( P > 0.05 \); ET vs. HEA, 0.3 points, \( P > 0.05 \)), linear mixed model analyses incorporating all time points yielded a significant advantage for the 2 supervised exercise groups (ET + SMT vs. HEA, \( P = 0.03 \); ET vs. HEA, \( P = 0.02 \)). Similar results were observed for global perceived effect and satisfaction.

Conclusion. Supervised strengthening exercise with and without spinal manipulation performed similarly, yielding better outcomes than home exercise particularly in the short term. Various stakeholders' perspectives should be considered carefully when making recommendations regarding these therapies, taking into account side effects, preferences, and costs.
Abstract
Screening for integrity of the ligaments of the craniocervical complex has been suggested prior to the application of manual techniques to the upper cervical spine. However, most tests proposed lack validation limiting their usefulness clinically. This study examined the effect of the anterior shear test for the transverse ligament and the distraction test for the tectorial membrane in normal volunteers. MRI was performed in supine in neutral and end-range stress test positions in 16 individuals using proton density-weighted sequences and a standard head coil in a 3-T system. Measurements were made with respect to a strictly standardised protocol. The anterior shear test was assessed using changes in atlantodental interval and distance from the anterior arch of the atlas to the posterior aspect of the odontoid process. Distraction testing for the tectorial membrane was assessed by changes in basion-dental interval and by direct measurement of the tectorial membrane. Differences were compared using Wilcoxon Sign Rank tests or paired \( t \)-test depending upon each variables assessment of normality. Anterior shear testing resulted in a 0.41 mm mean increase in atlantodental interval (\( p = 0.03 \)) and 0.35 mm mean increase in axial plane distance (\( p = 0.05 \)). Distraction testing for the tectorial membrane resulted in a 0.64 mm increase in basion-dental interval (\( p < 0.01 \)) and a 1.11 mm increase in direct ligament length measurement (\( p = 0.02 \)). Reliability of measurements ranged from moderate to substantial. These results indicate that these tests produce a consistent direct effect on the transverse ligament and the tectorial membrane which is consistent with their theorised mechanism for clinical use.

Keywords: Transverse ligament, Tectorial membrane, Screening tests
Elbow

Medical diagnosis of cubital tunnel syndrome ameliorated with thrust manipulation of the elbow and carpals

Authors: Kearns, Gary; Wang, Sharon

Source: Journal of Manual & Manipulative Therapy, Volume 20, Number 2, 2012, pp. 90-95

Abstract:
This case report describes the effectiveness of thrust manipulation to the elbow and carpals in the management of a patient referred with a medical diagnosis of cubital tunnel syndrome (CuTS). The patient was a 45-year-old woman with a 6-week history of right medial elbow pain, ulnar wrist pain, and intermittent paresthesia in the ulnar nerve distribution. Upon initial assessment, she presented with a positive elbow flexion test and upper limb neurodynamic test with ulnar nerve bias. A biomechanical assessment of the elbow and carpals revealed a loss of lateral glide of the humerus on the ulna and a loss of palmar glide of the triquetral on the hamate. After the patient received two thrust manipulations of the elbow and one thrust manipulation of the carpals over the course of four sessions, her pain and paresthesia were resolved. This case demonstrates that the use of thrust manipulation to the elbow and carpals may be an effective approach in the management of insidious onset CuTS. This patient was successfully treated with thrust manipulation when joint dysfunction of the elbow and wrist were appropriately identified. This case report may shed light on the examination and management of insidious onset CuTS.
Abstract

Background and Purpose: The incidence of peripartum and postpartum posterior pelvic pain is high. However, meralgia paresthetica or lateral femoral cutaneous neuropathy is considered rare and presents with a loss of the anterolateral thigh sensation. The purpose of this case report was to present the successful treatment of musculoskeletal impairments in a postpartum patient with the primary diagnosis of meralgia paresthetica and poor functional mobility with pain.

Case Description: This case describes a postpartum patient with anterolateral thigh sensory loss and posterior pelvic pain. Medical history included an 8-year-old history of low back pain. The patient with a right anterior innominate, hip weakness, and iliopsoas length restrictions was seen for 14 physical therapy treatment sessions consisting of manual therapy and core stabilization exercise.

Outcomes: After physical therapy management, the patient reported decreased pelvic girdle pain and the patient-specific functional scale score improved from a score of 13 to 42. Upon discharge, the patient ambulated without a device and was able to care for her newborn child.

Discussion: Manual therapy techniques and core stabilization exercises were interventions applied to manage a postpartum client with paresis and paresthesia in bilateral lower extremities causing functional mobility impairments. Manual techniques to improve joint alignment, mobility, and soft tissue flexibility improved symptoms. Further studies will be beneficial to determine the prevalence of sacral/pelvic alignment dysfunction in patients with lateral femoral cutaneous neuropathy and associated musculoskeletal impairments. In addition, research is needed to determine the most effective manual therapy techniques for patients with pregnancy-related neuropathies.
LBP/abdominals

Spine:
01 June 2012 - Volume 37 - Issue 13 - p 1101–1108
doi: 10.1097/BRS.0b013e318241377c
Randomized Trial
Effect of Core Stability Exercises on Feed-Forward Activation of Deep Abdominal Muscles in Chronic Low Back Pain: A Randomized Controlled Trial
Vasseljen, Ottar PhD, PT*; Unsgaard-Tøndel, Monica MSc, PT*; Westad, Christian PhD†; Mork,

Study Design. A randomized controlled trial.

Objective. To investigate feed-forward activation or timing of abdominal muscle activation in response to rapid shoulder flexion after 8 weeks with core stability exercises, sling exercises, or general exercises in chronic nonspecific low back pain (LBP) patients.

Summary of Background Data. Delayed onset in abdominal muscles has been associated with LBP. Low load exercises to volitionally activate the transversus abdominis were introduced to restore trunk muscle activation deficits. More forceful co-contraction exercises have been advocated by others. This study explored whether abdominal muscle onset changed after low-load core stability exercises, high-load sling exercises, or general exercises.

Methods. Subjects (N = 109) with chronic nonspecific LBP of at least 3 months' duration were randomly assigned to 8 weekly treatments with low-load core stability exercises, high-load stabilizing exercises in slings, or general exercises in groups. Primary outcome was onset recorded bilaterally by m-mode ultrasound imaging in the deep abdominal muscles in response to rapid shoulder flexion.

Results. No or small changes were found in onset after treatment. Baseline adjusted between group differences showed a 15 ms (95% confidence interval [CI], 1–28; P = 0.03) and a 19 ms (95% CI, 5–33; P < 0.01) improvement with sling relative to core stability and general exercises, respectively, but on 1 side only. There was no association between changes in pain and onset over the intervention period (R² ≤ 0.02).

Conclusion. Abdominal muscle onset was largely unaffected by 8 weeks of exercises in chronic LBP patients. There was no association between change in onset and LBP. Large individual variations in activation pattern of the deep abdominal muscles may justify exploration of differential effects in subgroups of LBP.
SI joint injections

A systematic evaluation of the therapeutic effectiveness of sacroiliac joint interventions: systematic review Full Text □Pain Physician, 05/31/2012
Hansen H et al. – The evidence was fair in favor of cooled radiofrequency neurotomy and poor for short–term and long–term relief from intraarticular steroid injections, periarticular injections with steroids or botulin toxin, pulsed radiofrequency, and conventional radiofrequency neurotomy.

Methods
A systematic review of therapeutic sacroiliac joint interventions.

The available literature on therapeutic sacroiliac joint interventions in managing chronic low back and lower extremity pain was reviewed.

The quality assessment and clinical relevance criteria utilized were the Cochrane Musculoskeletal Review Group criteria for randomized trials of interventional techniques and the criteria developed by the Newcastle–Ottawa Scale for observational studies.

The level of evidence was classified as good, fair, or poor based on the quality of evidence developed by the U.S. Preventive Services Task Force (USPSTF).

Data sources included relevant literature published from 1966 through December 2011 that was identified through searches of PubMed and EMBASE, and manual searches of the bibliographies of known primary and review articles.

The primary outcome measure was pain relief (short–term relief = up to 6 months and long–term > 6 months).

Secondary outcome measures were improvement in functional status, psychological status, return to work, and reduction in opioid intake.

Results
For this systematic review, 56 studies were considered for inclusion.

Of these, 45 studies were excluded and a total of 11 studies met inclusion criteria for methodological quality assessment with 6 randomized trials and 5 non–randomized studies.

The evidence for cooled radiofrequency neurotomy in managing sacroiliac joint pain is fair.

The evidence for effectiveness of intraarticular steroid injections is poor.

The evidence for periarticular injections of local anesthetic and steroid or botulinum toxin is poor.

The evidence for effectiveness of conventional radiofrequency neurotomy is poor.

The evidence for pulsed radiofrequency is poor.
Chronic pain/central sensitization

A body-part-specific impairment in the visual recognition of actions in chronic pain patients

Pain, 05/31/2012

de Lussanet MHE et al. – This result gives important new insights into chronic pain. Also, this new impairment of biological motion perception is unique in that it is unrelated to visual deficits.

Most people suffer musculoskeletal pain sometime in their lives.

Although the pain usually disappears with the healing, it may become chronic.

Recent evidence suggests that high–level cortical representations play a role in chronic pain.

Here authors hypothesized that the sensorimotor representations of the affected body parts are specifically inhibited with chronic pain.

Thus, if these representations are not accessible for the actions performed by one’s own body, neither should they be for the perception of actions performed by others.

Chronic pain patients are often focused on possibly painful movements, but visual processes are not affected by chronic pain, so they expected that patients should have no problems recognizing point–light biological motion displays, but should be unable to extract detailed somatosensory and motor information from such displays.

Indeed, authors found that patients had no difficulty perceiving point–light biological motion, and were not impaired in judging manipulated weight from movements they would be able to perform.

However, patients with chronic shoulder pain were specifically impaired to judge the weight from observed manual transfer movements, whereas chronic low–back pain patients were specifically impaired for trunk–rotation movements.
Sitting posture

What do physiotherapists consider to be the best sitting spinal posture? Manual Therapy, 05/31/2012
O'Sullivan K et al. –

The choice of best sitting posture also varied between countries (p < 0.05). Overall, disagreement remains on what constitutes a neutral spine posture, and what is the best sitting posture. Qualitative comments indicated that sitting postures which matched the natural shape of the spine, and appeared comfortable and/or relaxed without excessive muscle tone were often deemed advantageous.

While sitting is a common aggravating factor in low back pain (LBP), the best sitting posture remains unclear. This study investigated the perceptions of 295 physiotherapists in four different European countries on sitting posture. Physiotherapists selected their perceived best sitting posture from a sample of nine options that ranged from slumped to upright sitting, as well as completing the back beliefs questionnaire (BBQ). 85% of physiotherapists selected one of two postures as best, with one posture being selected significantly more frequently than the remainder (p < 0.05). Interestingly, these two most frequently selected postures were very different from each other. Those who selected the more upright sitting posture had more negative LBP beliefs on the BBQ (p < 0.05). The choice of best sitting posture also varied between countries (p < 0.05). Overall, disagreement remains on what constitutes a neutral spine posture, and what is the best sitting posture. Qualitative comments indicated that sitting postures which matched the natural shape of the spine, and appeared comfortable and/or relaxed without excessive muscle tone were often deemed advantageous. Further research on the perceptions of people with LBP on sitting posture are indicated.
Abdominals/breathing

Comparison of changes in the contraction of the lateral abdominal muscles between the abdominal drawing-in maneuver and breathe held at the maximum expiratory level

Ishida H et al. – Maximum expiration produced a significant increase in the thickness of the TrA and IO muscles compared to the ADIM (p < 0.001). The EMG activity of the EO muscle was significantly higher during maximum expiration than during the ADIM (p < 0.001). The intensity of the EMG activity of the EO muscle was approximately 30% of the maximal voluntary contraction during maximum expiration. Thus, maximum expiration may be an effective method for training of co-activation of the lateral abdominal muscles.

The abdominal drawing-in maneuver (ADIM) is commonly used as a fundamental component of lumbar stabilization training programs. One potential limitation of lumbar stabilization programs is that it can be difficult and time consuming to train people to perform the ADIM.

The transverse abdominis (TrA), internal oblique (IO), and external oblique (EO) muscles are the most powerful muscles involved in expiration. However, little is known about the differences in the recruitment of the abdominal muscles between the ADIM and breathe held at maximum expiratory level (maximum expiration).

The thickness of the TrA and IO muscles was measured by ultrasound imaging, and the activity of the EO muscle was measured by electromyography (EMG) in 33 healthy male performing the ADIM and maximum expiration.

Maximum expiration produced a significant increase in the thickness of the TrA and IO muscles compared to the ADIM (p < 0.001). The EMG activity of the EO muscle was significantly higher during maximum expiration than during the ADIM (p < 0.001). The intensity of the EMG activity of the EO muscle was approximately 30% of the maximal voluntary contraction during maximum expiration.

Thus, maximum expiration may be an effective method for training of co-activation of the lateral abdominal muscles.
Primary Care Referral of Patients with Low Back Pain to Physical Therapy: Impact on Future Healthcare Utilization and Costs.

Fritz JM, Childs JD, Wainner RS, Flynn TW.

Source

Associate Professor, Department of Physical Therapy, University of Utah and Clinical Outcomes Research Scientist, Intermountain Healthcare, Salt Lake City, Utah. Associate Professor and Director of Research, US Army-Baylor University Doctoral Program in Physical Therapy, Ft Sam Houston, San Antonio, Texas Associate Professor, Texas State University - San Marcos, San Marcos, Texas Distinguished Professor, Rocky Mountain University of Health Professions.

Abstract

Study Design. Retrospective cohort Objective. To describe physical therapy utilization following primary care consultation for low back pain (LBP) and evaluate associations between the timing and content of physical therapy and subsequent healthcare utilization and costs. Summary of Background Data. Primary care management of LBP is highly variable and the implications for subsequent costs are not well-understood. The value of referring patients from primary care to physical therapy has been debated, and information on how the timing and content of physical therapy impact subsequent costs and utilization is needed. Methods. Data were extracted from a national database of employer-sponsored health plans. 32,070 patients with a new primary care LBP consultation were identified and categorized based on the use of physical therapy within 90 days. Patients utilizing physical therapy were further categorized based on timing (early (within 14 days) or delayed) and content (guideline adherent or non-adherent). LBP-related healthcare costs and utilization in the 18-months following primary care consultation were examined. Results. Physical therapy utilization was 7.0% with significant geographic variability. Early physical therapy timing was associated with decreased risk of advanced imaging (OR = 0.34, 95% CI: 0.29, 0.41), additional physician visits (OR = 0.26, 95% CI: 0.21, 0.32), surgery (OR = 0.45, 95% CI: 0.32, 0.64), injections (OR = 0.42, 95% CI: 0.32, 0.64), and opioid medications (OR = 0.78, 95% CI: 0.66, 0.93) as compared with delayed physical therapy. Total medical costs for LBP were $2736.23 lower (95% CI: 1810.67, 3661.78) for patients receiving early physical therapy. Physical therapy content showed weaker associations with subsequent care. Conclusion. Early physical therapy following a new primary care consultation was associated with reduced risk of subsequent healthcare compared with delayed physical therapy. Further research is needed to clarify exactly which patients with LBP should be referred to physical therapy; however if referral is to be made, delaying the initiation of physical therapy may increase risk for additional healthcare consumption and costs.

PMID: 22614792 [PubMed - as supplied by publisher]
Optimal lumbopelvic stability is a function of form closure (joint anatomy), force closure (additional compressive forces acting across the joints) and neuromotor control. Impairment of any of these mechanisms can result in pain, instability, altered lumbopelvic kinematics, and changes in muscle strength and motor control. External pelvic compression (EPC) has been hypothesised to have an effect on force closure and neuromotor control. However, the specific application parameters (type, location and force) and hypothesized effects of EPC are unclear. Thus, a systematic review was conducted to summarize the in vivo and in vitro effects of EPC. Eighteen articles met the eligibility criteria, with quality ranging from 33% to 72% based on a modified Downs and Black index. A modified van Tulder's rating system was used to ascertain the level of evidence synthesised from this review. There is moderate evidence to support the role of EPC in decreasing laxity of the sacroiliac joint, changing lumbopelvic kinematics, altering selective recruitment of stabilizing musculature, and reducing pain. There is limited evidence for effects of EPC on decreasing sacral mobility, and affecting strength of muscles surrounding the SIJ, factors which require further investigation.
Within-day reliability of shoulder range of motion measurement with a smartphone.

Shin SH, Ro du H, Lee OS, Oh JH, Kim SH.

Source

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Abstract

Measuring range of motion (ROM) is the first step of a physical examination and functional evaluation of the shoulder joint. Digital inclinometers are available on the market; however, they are expensive, and hence will not come into wide use. In this study, we present a new method for the shoulder ROM measurement using the inclinometer application on a smartphone. We hypothesized that the method would demonstrate acceptable reliability and reproducibility. Three observers performed goniometric and smartphone inclinometric measurements of various shoulder movements, including both active and passive ROM for forward flexion, abduction, external rotation while the arms are at the sides, external rotation at 90° abduction, and internal rotation at 90° abduction. Measurements were performed in the affected shoulders of 41 patients. All measurements were taken twice to assess the intra-observer reliability. Inter- and intra-observer reliabilities were evaluated using the intraclass correlation coefficient (ICC). Reliability between two measurements was also assessed in terms of the ICC. Both the goniometric and inclinometric measurements showed satisfactory inter-observer reliability except for internal rotation at 90° abduction for which the ICC value was <0.7 (range, 0.63-0.68). Intra-observer reliability was excellent with an ICC value>0.9, except for some movements. Within-day inclinometric measurements with a smartphone showed acceptable reliability compared to the classical goniometric measurements of movements and the correlation between the two measurements was fairly high. Considering convenience and cost-effectiveness, this new method could be widely used for measuring the shoulder ROM, although the between-day reliability needs to be established first.

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PMID: 22421186 [PubMed - in process]
BACKGROUND:
Pelvic organ prolapse is common, and some degree of prolapse is seen in 50% of parous women. Women with prolapse can experience a variety of pelvic floor symptoms. Treatments include surgery, mechanical devices and conservative management. Conservative management approaches, such as giving lifestyle advice and delivering pelvic floor muscle training (PFMT), are often used in cases of mild to moderate prolapse. This is an update of a Cochrane review first published in 2004, and previously updated in 2006.

OBJECTIVES:
To determine the effects of conservative management (physical and lifestyle interventions) for the prevention or treatment of pelvic organ prolapse in comparison with no treatment or other treatment options (such as mechanical devices or surgery).

MAIN RESULTS:
Six trials were included; three of these trials are new to this update. Four trials were small (less than 25 women per arm) and two had moderate to high risk of bias. Four trials compared PFMT as a treatment for prolapse against a control group (n = 857 women); two trials included women having surgery for prolapse and compared PFMT as an adjunct to surgery versus surgery alone (n = 118 women). PFMT versus control: There was a significant risk of bias in two out four trials in this comparison. Prolapse symptoms and women's reports of treatment outcomes (primary outcomes) were measured differently in the three trials where this was reported: all three indicated greater improvement in symptoms in the PFMT group compared to the control group. Pooling data on severity of prolapse from two trials indicated that PFMT increases the chance of an improvement in prolapse stage by 17% compared to no PFMT. The two trials which measured pelvic floor muscle function found better function (or improvement in function) in the PFMT group compared to the control group; measurements were not known to be blinded. Two out of three trials which measured urinary outcomes (urodynamics, frequency and bother of symptoms, or symptom score) reported differences between groups in favour of the PFMT group. One trial reported bowel outcomes, showing less frequency and bother with symptoms in the PFMT group compared to the control group. PFMT supplementing surgery versus surgery alone: Both trials were small and neither measured prolapse-specific outcomes. Pelvic floor muscle function findings differed between the trials: one found no difference between trial groups in muscle strength, whilst the other found a benefit for the PFMT group in terms of stronger muscles. Similarly findings relating to urinary outcomes were contradictory: one trial found no difference in symptom score change between groups, whilst the other found more improvement in urinary symptoms and a reduction in diurnal frequency in the PFMT group compared to the control group.

AUTHORS' CONCLUSIONS:
There is now some evidence available indicating a positive effect of PFMT for prolapse symptoms and severity. The largest most rigorous trial to date suggests that six months of supervised PFMT has benefits in terms of anatomical and symptom improvement (if symptomatic) immediately post-intervention. Further evidence relating to effectiveness and cost-effectiveness of PFMT, of different intensities, for symptomatic prolapse in the medium and long term is needed. A large trial of PFMT supplementing surgery is needed to give clear evidence about the usefulness of combining these treatments. Other comparisons which have not been addressed in trials to date and warrant consideration include those involving lifestyle change interventions, and trials aimed at prolapse prevention.
LBP


Effectiveness of self-management of low back pain: Systematic review with meta-analysis.

Oliveira VC, Ferreira PH, Maher CG, Pinto RZ, Refshauge KM, Ferreira ML.

Source
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Abstract
OBJECTIVE.: To determine the effectiveness of self-management for non-specific low back pain (LBP). METHODS.: We performed a systematic review searching MEDLINE, EMBASE, CINAHL, PsycINFO, LILACS, PEDro, AMED, SportDiscus and Cochrane databases from earliest record to April 2011. Randomised controlled trials evaluating self-management for non-specific LBP and assessing pain and disability were included. The PEDro scale was used to assess methodological quality of included trials. Data were pooled where studies were sufficiently homogenous. Analyses were conducted separately for short (less than 6 months after randomization) and long (at least 12 months after randomization) term follow-ups. Six criteria for self-management were used to assess content of the intervention. RESULTS.: The search identified 2325 titles, of which 13 original trials were included. Moderate quality evidence showed that self-management is effective for improving pain and disability for people with LBP. The weighted mean difference for pain was -3.2 points on a 0-100 scale (95% confidence interval: -5.1 to -1.3) and for disability -2.3 points (-3.7 to -1.0) at short-term follow-up. The long-term effects were -4.8 (-7.1 to -2.5) for pain and -2.1 (-3.6 to -0.6) for disability. CONCLUSION.: There is moderate quality evidence that self-management has small effects on pain and disability in people with LBP. These results challenge the endorsement of self-management in treatment guidelines. © 2012 by the American College of Rheumatology.

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PMID: 22623349 [PubMed - as supplied by publisher]
Abstract

OBJECTIVE: The purpose of this study was to compare the effects of 2 exercise programs, segmental stabilization exercises (SSEs) and stretching of trunk and hamstrings muscles, on functional disability, pain, and activation of the transversus abdominis muscle (TrA), in individuals with chronic low back pain.

METHODS: A total of 30 participants were enrolled in this study and randomly assigned to 1 of 2 groups as a function of intervention. In the segmental stabilization group (SS), exercises focused on the TrA and lumbar multifidus muscles, whereas in the stretching group (ST), exercises focused on stretching the erector spinae, hamstrings, and triceps surae. Severity of pain (visual analog scale and McGill pain questionnaire) and functional disability (Oswestry disability questionnaire) and TrA muscle activation capacity (Pressure Biofeedback Unit, or PBU) were compared as a function of intervention. Interventions lasted 6 weeks, and sessions happened twice a week (30 minutes each). Analysis of variance was used for intergroup and intragroup comparisons.

RESULTS: As compared with baseline, both treatments were effective in relieving pain and improving disability (P < .001). Those in the SS group had significantly higher gains for all variables. The stretching group did not effectively activate the TrA (P = .94).

CONCLUSION: Both techniques improved pain and reduced disability. In this study, SS was superior to muscular stretching for the measured variables associated with chronic low back pain.

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PMID: 22632587 [PubMed - in process]
Gender differences in both active and passive parts of the plantar flexors series elastic component stiffness and geometrical parameters of the muscle-tendon complex.

Fouré A, Cornu C, McNair PJ, Nordez A.

Source
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Abstract
Men are reportedly at higher risk of plantar flexor muscle injury and Achilles tendon ruptures than women. Biomechanical parameters are thought to play a role in the higher frequency of injury to males. One parameter is the stiffness of tissues; a stiff tissue cannot absorb sufficient energy with loading, and subsequently may be more likely to be injured. Thus, our purpose was to investigate the gender difference in the geometrical parameters of plantar flexor's muscle-tendon complex and the stiffness of both active and passive parts of the series elastic component (S(SEC1) and S(SEC2), respectively). Using the alpha method on data obtained from quick stretches to the plantar flexors performed during isometric contractions, S(SEC1) and S(SEC2) were assessed. Plantar flexor muscles and Achilles tendon cross-sectional areas (CSA(TS) and CSA(AT), respectively) were determined in young healthy men (n = 49) and women (n = 31). The findings showed that S(SEC2) was higher in men (p < 0.001), but this difference was not apparent when S(SEC2) was normalized to CSA(AT) (p > 0.05). In contrast, S(SEC1) was lower in men (p < 0.001) and remained so after normalization to CSA(TS). Higher joint stiffness observed in men was notably influenced by lever arm length. Thus, the results of this study have implications for performance and injury.

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PMID: 22034230 [PubMed - indexed for MEDLINE]
Aims. The purpose of the study was to measure the effectiveness of a spine training programme (Back School) in nurses who have been living with chronic low back pain. It was hypothesised that active therapy, ergonomics and education called Back School will significantly decrease the pain intensity levels and improve the body posture of the study participants.

Background. A chronic low back pain is a significant work-related health problem among healthcare workers around the world. Proper body posture is essential for decreasing pain in healthcare workers who have history of chronic low back pain. By teaching proper body posture and with the creation of occupational settings that are ‘spine-friendly’ hospitals and other healthcare settings can significantly lower the suffering of their nursing staff.

Methods. The study was carried out at the University of Pecs, Faculty of Health Sciences from 2007 to 2008 involving 124 nurses with low back pain. Participants were randomly assigned to the study group (who have received ergonomics training and education called Back School) with an intervention conducted once a week for a six-week period. The control group received passive physiotherapy once a week for a six-week period. Further follow-up measurements were conducted at six and 12 months, respectively. The study variables and outcome measures were pain intensity and body posture (angle of thoracic kyphosis and lumbar lordosis). The pain intensity was investigated with the Visual Analogue Scale. Body posture was recorded and analysed with the Zebris biomechanical motion analysis system.

Results. The statistical analysis of repeated measures indicated a significant decrease in back pain intensity after the therapy in both groups, compared with measurements before the therapy; however, the BS group showed significantly better results during the six-month and one-year follow-up period. The biomechanical analysis of postures after the therapy in the BS group showed significant improvements over the control group; during the follow-up, the difference was still significant, yet slightly reduced.

Conclusions. This study has shown that a significant reduction in the pain intensity and improvement in body posture can be achieved by the usage of the active physical therapy methods (Back School) in nurses who are experiencing chronic lower back pain.

Relevance to clinical practice. The Back School program when compared with the passive physical therapies (such as massage, ultrasound treatment, etc.) shows significant improvement in reduction in pain and greatly improves the posture of healthcare workers. The adoption of the Back School program for the treatment of the healthcare workers with chronic low back problems should be a treatment of choice and standard that should be adopted when designing occupational healthcare policies and procedures.
Knee


Abstract

Background Patellar taping is a common treatment modality for physical therapists managing patellofemoral pain. However, the mechanisms of action remain unclear, with much debate as to whether its efficacy is due to a change in patellar alignment or an alteration in sensory input.

Objective The purpose of this study was to investigate the sensory input hypothesis using functional magnetic resonance imaging when taping was applied to the knee joint during a proprioception task.

Design This was an observational study with patellar taping intervention.

Methods Eight male volunteers who were healthy and right-leg dominant participated in a motor block design study. Each participant performed 2 right knee extension repetitive movement tasks: one simple and one proprioceptive. These tasks were performed with and without patellar taping and were auditorily paced for 400 seconds at 72 beats/min (1.2 Hz).

Results The proprioception task without patellar taping caused a positive blood oxygenation level–dependant (BOLD) response bilaterally in the medial supplementary motor area, the cingulate motor area, the basal ganglion, and the thalamus and medial primary sensory motor cortex. For the proprioception task with patellar taping, there was a decreased BOLD response in these regions. In the lateral primary sensory cortex, there was a negative BOLD response with less activity for the proprioception task with taping.

Limitations This study may have been limited by the small sample size, a possible learning effect due to a nonrandom order of tasks, and use of a single-joint knee extension task.

Conclusions This study demonstrated that patellar taping modulates brain activity in several areas of the brain during a proprioception knee movement task.
Psychometric features of temporomandibular disorders patients in relation to pain diffusion, location, intensity and duration

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Journal of Oral Rehabilitation

Summary The aim of the present investigation was to assess the psychological profile of a sample of patients with temporomandibular disorders (TMD) and to compare the psychometric scores between patients with pain of different diffusion, location, intensity and duration. One hundred and ten (N = 110) patients with painful TMD fulfilled three psychometric instruments. Pain features were assessed as categorical variables as concerns its diffusion, viz., diffuse or localised, duration, viz., more or <6 months, and location, viz., joint and/or muscles. Pain intensity was scored on a 0–100 Visual Analog Scale (VAS) rating. Patients with diffuse pain showed higher psychometric scores than patients with localised pain. No significant differences were detected between patients with pain lasting from more or equal than 6 months and those with pain lasting from <6 months as well as between patients with pain localised in the jaw muscles, joints or both, even if a trend for lower scores for patients with joint pain alone was observed. Pain intensity was significantly related with anxiety (ANX), depression (DEP) and somatisation(SOM) scores. In conclusion, pain diffusion and intensity were strongly related with high levels of SOM, ANX and DEP, while no differences in psychometric scores were detected between patients with pain of different duration and location.
Office workers' risk factors for the development of non-specific neck pain: a systematic review of prospective cohort studies

Arpalak Paksachol, Prawit Janwantanakul, Nithima Purepong, Praneet Pensri, Allard J van der Beek

Abstract
The purpose of this study was to systematically review prospective cohort studies to gain insights into risk factors for the development of non-specific neck pain in office workers as well as to assess the strength of evidence. Publications were systematically searched from 1980 - March 2011 in several databases. The following key words were used: neck pain paired with risk or prognostic factors and office or computer or visual display unit or visual display terminal. Relevant studies were retrieved and assessed for methodological quality by two independent reviewers. The strength of the evidence was based on methodological quality and consistency of the results. Five high-quality and two low-quality prospective cohort studies investigating the predictive value of 47 individual, work-related physical and work-related psychosocial factors for the onset of non-specific neck pain in office workers were included in this review. Strong evidence was found for female gender and previous history of neck complaints to be predictors of the onset of neck pain. Interestingly, for a large number of factors that have been mentioned in the literature as risk factors for neck pain, such as high physical leisure activity, low social support, and high psychosocial stress, we found no predictive value for future neck pain in office workers. Literature with respect to the development of non-specific neck pain in office workers is scant. Only female gender and previous history of neck complaints have been identified as risk factors that predict the onset of neck pain.
Craniofacial pain

**Incidence of craniofacial pain of cardiac origin: results from a prospective multicentre study**

Danesh–Sani SH et al. – Cardiac pain commonly radiates to the craniofacial structures. Pain of cardiac origin is usually described as pressure and/or a burning sensation that is provoked by physical activity and relieved by rest. Craniofacial pain of cardiac origin usually occurs bilaterally. Dental practitioners can play a crucial role in the diagnosis of craniofacial pain of cardiac origin.

**Abstract**

**Background:** The aim of this study was to reveal the incidence and distribution pattern of craniofacial pain of cardiac origin.

**Methods:** We undertook a prospective study of 248 consecutive patients (aged 26 to 88 years) hospitalized with confirmed cardiac ischaemic periods. Digital OPG radiographs were obtained from all patients for radiographic examination of the jaws and dentition. Patients underwent clinical and radiographic examinations, and symptoms were evaluated in detail to determine the prevalence and distribution pattern of craniofacial pain of cardiac origin.

**Results:** Craniofacial pain was the sole symptom of cardiac ischaemia in 13 patients (5.2%); two developed acute myocardial infarction (AMI). Pain in the craniofacial region, chest, shoulders and arms was experienced by 72 patients. The most frequently affected region was the left mandible. In the absence of chest pain, patients most frequently experienced pain in craniofacial structures. Incidence of craniofacial pain was significantly higher in females than males (p = 0.024).

**Conclusions:** Cardiac pain commonly radiates to the craniofacial structures. Pain of cardiac origin is usually described as pressure and/or a burning sensation that is provoked by physical activity and relieved by rest. Craniofacial pain of cardiac origin usually occurs bilaterally. Dental practitioners can play a crucial role in the diagnosis of craniofacial pain of cardiac origin.
Gait/amputee

The relationship between lumbar spine kinematics during gait and low-back pain in transfemoral amputees.

Morgenroth DC. Orendurff MS. Shakir A. Segal A. Shofer J. Czerniecki JM.


This article looked at gait mechanics in transfemoral amputees and compared the gait, particularly the lumbar spine mechanics at the initiation of swing phase, in those patients with and without back pain. Those with LBP showed a significant increase in transverse plane motion as compared to those without pain, which provides further evidence to the PNF outlook on gait mechanics that swing phase is initiated by pelvic anterior elevation and not trunk rotation. While this study looked at a limited patient population, it supports the theory that initiating the gait cycle with rotation can lead to increased stress on the intervertebral disc and increased degeneration of the annular fibers of the disc. This supports the PNF teaching that inefficiency in functional movements can lead to increased tissue degeneration and increased pain and dysfunction.
Cervicogenic head aches

Head Pain Referral During Examination of the Neck in Migraine and Tension-Type Headache: Headache: The Journal of Head and Face Pain, 05/29/2012
Watson DH et al. –

Objective.— To investigate if and to what extent typical head pain can be reproduced in tension-type headache (TTH), migraine without aura sufferers, and controls when sustained pressure was applied to the lateral posterior arch of C1 and the articular pillar of C2, stressing the atlantooccipital and C2-3 segments respectively.

Background.— Occipital and neck symptoms often accompany primary headache, suggesting involvement of cervical afferents in central pain processing mechanisms in these disorders. Referral of head pain from upper cervical structures is made possible by convergence of cervical and trigeminal nociceptive afferent information in the trigemino-cervical nucleus. Upper cervical segmental and C2-3 zygapophysial joint dysfunction is recognized as a potential source of noxious afferent information and is present in primary headache sufferers. Furthermore, referral of head pain has been demonstrated from symptomatic upper cervical segments and the C2-3 zygapophysial joints, suggesting that head pain referral may be a characteristic of cervical afferent involvement in headache.

Methods.— Thirty-four headache sufferers and 14 controls were examined interictally. Headache patients were diagnosed according the criteria of the International Headache Society and comprised 20 migraine without aura (females n = 18; males n = 2; average age 35.3 years) and 14 TTH sufferers (females n = 11; males n = 3; average age 30.7 years). Two techniques were used specifically to stress the atlantooccipital segments (Technique 1 – C1) and C2-3 zygapophysial joints (Technique 2 – C2). Two techniques were also applied to the arm – the common extensor origin and the mid belly of the biceps brachii. Participants reported reproduction of head pain with “yes” or “no” and rated the intensity of head pain and local pressure of application on a scale of 0 -10, where 0 = no pain and 10 = intolerable pain.

Results.— None of the subjects reported head pain during application of techniques on the arm. Head pain referral during the cervical examination was reported by 8 of 14 (57%) control participants, all TTH patients and all but 1 migrainer (P < .002). In each case, participants reported that the referred head pain was similar to the pain they usually experienced during TTH or migraine. The frequency of head pain referral was identical for Techniques 1 and 2. The intensity of referral did not differ between Technique 1 and Technique 2 or between groups. Tenderness ratings to thumb pressure were comparable between the Techniques 1 and 2 when pressure was applied to C1 and C2 respectively and across groups. Similarly, there were no significant differences for tenderness ratings to thumb pressure between Technique 1 and Technique 2 on the arm or between groups. While tenderness ratings to thumb pressure for Technique 2 were similar for both referral (n = 41) and non-referral (n = 7) groups, tenderness ratings for Technique 1 in the referral group were significantly greater when compared with the non-referral group (P = .01).

Conclusions.— Our data support the continuum concept of headache, one in which noxious cervical afferent information may well be significantly underestimated. The high incidence of reproduction of headache supports the evaluation of musculoskeletal features in patients.
presenting with migrainous and TTH symptoms. This, in turn, may have important implications for understanding the pathophysiology of headache and developing alternative treatment options.

**Spinal Manipulation**

**Is Spinal Manipulation Effective for Pain? An Overview of Systematic Reviews**

*Evidence Based Medicine*

Posadzki P – Publication bias as a well-known phenomenon may have been inherited in this article. Collectively, these data fail to demonstrate that spinal manipulation is an effective intervention for pain management.

**Abstract**

**Objective.** This article is aimed at critically evaluating the evidence from systematic reviews (SRs) of spinal manipulation in patients with pain.

**Design.** The study was designed as a SR of SRs.

**Methods.** Four electronic databases were searched to identify all relevant articles of the effectiveness of spinal manipulation for pain. SRs were defined as articles employing a repeatable methods section.

**Results.** Twenty-two SRs relating to the following pain conditions: low back pain (N = 6), headache (N = 5), neck pain (N = 4), any medical problem (N = 1), carpal tunnel syndrome (N = 1), dysmenorrhea (N = 1), fibromyalgia (N = 1), lateral epicondylitis (N = 1), musculoskeletal conditions (N = 1) and nonspinal pain (N = 1), were included. Positive or, for multiple SR, unanimously positive conclusions were drawn for none of the conditions mentioned earlier.

**Limitation.** Publication bias as a well-known phenomenon may have been inherited in this article.

**Conclusion.** Collectively, these data fail to demonstrate that spinal manipulation is an effective intervention for pain management.
Anterior fibrous bundle: a cause of residual pain and restrictive plantar flexion following ankle sprain

Knee Surgery, Sports Traumatology, Arthroscopy, 05/29/2012

Clinical Article

Miyamoto W et al. – An anterior fibrous bundle is one of the intra-articular residual disorders after ankle sprain that can cause restriction of plantar flexion.

Purpose
To describe anterior fibrous bundle as an intra-articular residual disorder following ankle sprain.

Methods
Between January 1998 and January 2009, we performed arthroscopy on 10 patients (7 males, 3 females; median age, 25 years; age range, 17–43 years) who had the uncommon problem of anterior ankle pain accompanied by restriction of plantar flexion following an ankle sprain. Pre-operative magnetic resonance imaging revealed osteochondral lesions (OCLs) of the talar dome in 3 patients, but no other findings that could explain restricted plantar flexion. All patients underwent arthroscopy for investigation and treatment of the cause of symptoms, and the 3 patients with OCL underwent additional arthroscopic drilling. Outcome was measured using the American Orthopedic Foot and Ankle Society Ankle-Hindfoot Scale (AOFAS) score, Visual Analogue Scale (VAS) for pain and active plantar flexion angle.

Results
In all patients, an anterior fibrous bundle was confirmed under arthroscopic investigation as the cause of symptoms and was resected arthroscopically. Median AOFAS and VAS scores improved significantly from 65 (range 61–82) and 70 (range 50–85) pre-operatively to 95 (range 84–100) and 4 (range 0–15) at final follow-up, respectively ($p < 0.001$). In addition, median active plantar flexion angle improved significantly from 40° (range 35–40) pre-operatively to 55° (range 45–55), ($p < 0.01$).

Conclusions
An anterior fibrous bundle is one of the intra-articular residual disorders after ankle sprain that can cause restriction of plantar flexion.
The craniocervical flexion test: An investigation of performance in young asymptomatic subjects  
Manual Therapy, 05/29/2012
Kelly M et al. – The Median Baseline Assessment score was 24 mmHg. Between–subject variability was high while physical activity levels; age or gender did not appear to influence the Deep Cervical Flexors (DCFs) muscle tonic holding capacity. The small heterogeneous sample involved in this study highlights the need for high quality normative studies to validate these findings.

Abstract

Introduction

The Deep Cervical Flexors (DCFs) provide support and segmental stability to the cervical spine. However, their endurance capacity can be reduced in cervicogenic disorders. The Craniocervical Flexion Test (CCFT) is regarded as the most effective means of assessing the contractile performance of these muscles. However, limited normative data exists to serve as a reference point during diagnosis.

Aim

This study examined CCFT performance in a group of young asymptomatic subjects and investigated the influence of physical activity levels, age and gender on CCFT score.

Method

The most recent CCFT protocol as described by Jull et al. (2008) was used. Baseline assessment scores along with certain patient characteristics were recorded on one occasion.

Results

For testing, 34 asymptomatic subjects were recruited (24 females, 10 males with a mean age of 21.5 ± 2.15 years). The median baseline assessment score was 24 mmHg (interquartile range = 3). Physical activity levels, age or gender did not significantly correlate with DNF endurance ($P > 0.05$).

Conclusion

The Median Baseline Assessment score was 24 mmHg (interquartile range = 3). Between-subject variability was high while physical activity levels; age or gender did not appear to influence the DCF muscle tonic holding capacity. The small heterogeneous sample involved in this study highlights the need for high quality normative studies to validate these findings.
Effectiveness of Therapeutic Lumbar Transforaminal Epidural Steroid Injections in Managing Lumbar Spinal Pain

Manchikanti L et al.

BACKGROUND: Among the multiple interventions used in managing chronic spinal pain, lumbar epidural injections have been used extensively to treat lumbar radicular pain. Among caudal, interlaminar, and transforaminal, transforaminal epidural injections have gained rapid and widespread acceptance for the treatment of lumbar and lower extremity pain. The potential advantages of transforaminal over interlaminar and caudal, include targeted delivery of a steroid to the site of pathology, presumably onto an inflamed nerve root. However, there are only a few well-designed, randomized, controlled studies on the effectiveness of steroid injections. Consequently, multiple systematic reviews with diverse opinions have been published.

STUDY DESIGN: A systematic review of therapeutic transforaminal epidural injection therapy for low back and lower extremity pain.

METHODS: The available literature on lumbar transforaminal epidural injections in managing chronic low back and lower extremity pain was reviewed. The quality assessment and clinical relevance criteria utilized were the Cochrane Musculoskeletal Review Group criteria as utilized for interventional techniques for randomized trials and by the Newcastle-Ottawa Scale criteria for observational studies. Data sources included relevant literature identified through searches of PubMed and EMBASE from 1966 to December 2011, and manual searches of the bibliographies of known primary and review articles.

The level of evidence was classified as good, fair, or poor based on the quality of evidence developed by the U.S. Preventive Services Task Force (USPSTF).

OUTCOME MEASURES: The primary outcome measure was pain relief (short-term relief = up to 6 months and long-term > 6 months). Secondary outcome measures were improvement in functional status, psychological status, return to work, and reduction in opioid intake.

RESULTS: For this systematic review, 70 studies were identified. Of these, 43 studies were excluded and a total of 27 studies met inclusion criteria for methodological quality assessment with 15 randomized trials (with 2 duplicate publications) and 10 non-randomized studies.

For lumbar disc herniation, the evidence is good for transforaminal epidural with local anesthetic and steroids, whereas it was fair for local anesthetics alone and the ability of transforaminal epidural injections to prevent surgery. For spinal stenosis, the available evidence is fair for local anesthetic and steroids. The evidence for axial low back pain and post lumbar surgery syndrome is poor, inadequate, limited, or unavailable.

LIMITATIONS: The limitations of this systematic review include the paucity of literature.

CONCLUSION: In summary, the evidence is good for radiculitis secondary to disc herniation with local anesthetics and steroids and fair with local anesthetic only; it is fair for radiculitis secondary to spinal stenosis with local anesthetic and steroids; and limited for axial pain and post
surgery syndrome using local anesthetic with or without steroids.

**Lumbar/surgery**

**The results of percutaneous intradiscal high-pressure injection of saline in patients with extruded lumbar herniated disc: comparison with microendoscopic discectomy**

Fukui S et al. – Intradiscal high–pressure injection of saline (IDHP) produced significant effects on patients with radicular pain, leading to the improvement of visual analog pain scale (VAS) and Japanese Orthopedic Association (JOA). Although IDHP displayed slightly less efficacy than microendoscopic discectomy (MED), IDHP appears to be an alternative as a nonoperative treatment for a lumbar intervertebral disc extrusion.

**Methods**

45 patients with primarily radicular pain due to an extrusion type disc herniation who underwent either IDHP (N = 24) or MED (N = 21) were enrolled in the study.

The visual analog pain scale (VAS) and the Japanese Orthopedic Association (JOA) scoring system for the treatment of low–back disorders were assessed at pretreatment, 2 weeks posttreatment, and JOA was again taken 3 months posttreatment.

Patients were asked to choose their satisfaction from four alternatives, “excellent,” “good,” “fair,” and “poor,” 3 months after treatment.

**Results**

Mean VAS decreased from 65.1 to 18.8 mm in the IDHP group, and from 80.6 to 16.5 in the MED group.

Mean JOA recovery rates at 3 months posttreatment were 67.2 and 75.2, and patients with “excellent” or “good” results were 73.7% and 78.6% in the IDHP and in MED, respectively.
Pain/Mood

Does Pain Improve Earlier than Mood in Depressed Patients with Painful Physical Symptoms Treated with Duloxetine

Hegerl U et al. – In duloxetine–responders to both pain and mood, self–rated pain improved slightly earlier than self–rated mood. The short temporal dissociation between pain and mood improvement might be explained by an earlier conscious perception of pain than mood changes.

Methods
Data were obtained within a prospective 6-month multi-centre naturalistic study in adult out-patients with depressive episodes treated with duloxetine (flexible doses: 30-120 mg/day).

Pain and mood were assessed daily by visual analogue scales.

For responders (n=622) “time to 50% pain response” and “time to 50% mood response” were determined by counting the earliest day between day 0 and 27, at which the patient achieved 50% improvement.

Results
Mean time to 50% pain response (mean 6.3 days, SD 5.3) was significantly shorter than time to 50% mood response (mean 7.6 days, SD 6.0, mean difference 1.3 days, SD 6.4; p<0.0001).
Pain/psychiatric patients

How does subjective experience of pain relate to psychopathology among psychiatric patients

General Hospital Psychiatry, 05/23/2012
Pompili M et al. – Pain and its subjective experience play a central role in psychiatric disorders, and it is a great burden for patients and caregivers. Clinicians should pay more attention to recognize and adequately treat painful symptoms in patients with anxiety and depressive disorder.

Methods
Participants were 575 consecutive outpatients affected by mood disorder or anxiety disorder.

Patients completed the West Haven–Yale Multidimensional Pain Inventory (WHYMPI) and the Symptom Checklist 90–Revised.

Results
Women had higher mean scores on the Global Severity Index (1.52±0.76 vs. 1.33±0.79), higher perception of negative responses from others (1.84±1.59 vs. 1.46±1.35) and higher perception of pain severity (3.31±1.73 vs. 2.88±1.63) than men.

They also reported higher mean scores on the WHYMPI's General Activity (2.14±0.98 vs. 1.93±0.95) and Household Chores (3.64±1.75 vs. 2.27±1.58) and lower mean scores on the Outdoor Work (1.24±1.26 vs. 1.87±1.51) dimension than men.

Higher pain severity, more negative responses from others and higher household chores are predictors of higher psychopathology, while the general level of activity may be considered as a protective factor.
Effect of depressive symptoms on perceived disability in patients with chronic shoulder pain

Archives of Orthopaedic and Trauma Surgery, 05/25/2012

Roh YH et al. – Degrees of depressive symptoms were found to be significantly associated with higher symptom scores and greater disability in patients with chronic shoulder pain. Although a large proportion of perceived disability remains unexplained, perceived disability in patients with chronic shoulder pain was found to be strongly influenced by depressive symptoms.

Background
Psychological distress may be an important determinant of perceived disability in patients with chronic musculoskeletal disorders. We evaluated the relationship between depressive symptoms and perceived disability in patients with chronic shoulder pain and quantified the contribution made by depression to perceived disability.

Methods
In this prospective study, 109 patients with chronic shoulder pain caused by degenerative or inflammatory disorders were evaluated using the Disability of Arm, Shoulder and Hand (DASH) questionnaire and the Center for Epidemiologic Studies-Depression (CES-D) Scale to determine relationships between depressive symptoms and perceived disability in patients with chronic shoulder pain. In addition, pain scores were evaluated using a visual analog scale (VAS) during activity, and range of motion (ROM) and abduction strength (strength) measurements were measured. Multivariate analyses of variance and regression modeling were used to assess the relative contributions made by depressive symptoms (CES-D) and other clinical parameters to patient-perceived disability (DASH).

Results
DASH scores were found to be moderately correlated (0.3 < r < 0.6) with ROM, strength, pain VAS and CES-D; DASH scores were more strongly correlated with CES-D scores than with pain VAS scores or range of motion (r = 0.58; p < 0.001, 0.37; p < 0.001, 0.32; p = 0.04 respectively). Multiple stepwise regression analyses revealed that gender, ROM, pain VAS and CES-D scores independently predicted DASH score and accounted for 43 % of the variance. CES-D score was found to be the strongest predictor of DASH score and accounted for 23 % of the variance.

Conclusions
Degrees of depressive symptoms were found to be significantly associated with higher symptom scores and greater disability in patients with chronic shoulder pain. Although a large proportion of perceived disability remains unexplained, perceived disability in patients with chronic shoulder pain was found to be strongly influenced by depressive symptoms.

Type of study/level of evidence
Level 2, prospective cohort study, prognostic study.
Fear/movement

Reduction of fear of movement-related pain and pain-related anxiety: An associative learning approach using a voluntary movement paradigm  [Pain, 05/23/2012]

Meulders A et al. – Results revealed that fear ratings for the conditioned stimuli (CS)+ were extinguished in the extinction group but not in the control group. Interestingly, omitting the intertrial interval (ITI) shocks not only reduced ITI startle responses in the context exposure group compared with the control group, but also reduced the fear ratings and startle responses elicited by the unpredictable CS. The clinical implications of these findings are discussed.

Summary
Pain-related fear and anxiety can be reduced by a Pavlovian extinction procedure. Reducing pain-related anxiety promotes safety (inhibitory) learning about movements never associated with pain.

Abstract
The fear-avoidance model advances fear of pain as a key factor in the origins of chronic pain disability. Initial evidence in those with chronic back pain reveals that exposure therapy reduces fear levels, disability, and pain. Despite the success of exposure in the clinic, fundamental research about its underlying mechanisms lags behind. Using a conditioning paradigm with movements as conditioned stimuli (CS) and a painful shock as unconditioned stimuli (US), we investigated the extinction of experimental fear of movement-related pain and pain-related anxiety (respectively induced by predictable and unpredictable pain). Dependent measures were self-reported fear and eyeblink startle. During acquisition, all groups received both predictable and unpredictable training. In the predictable context, one movement (CS+) was consistently followed by the shock-US, but another movement was not (CS−). In the unpredictable context, joystick movements never signaled the shock-US; shock-US were delivered during the intertrial interval (ITI). During extinction, the extinction group continued training in the predictable context but the CS+ movement was no longer reinforced; the context exposure group continued training in the unpredictable context but ITI shock-US were omitted. The control group continued training after the acquisition reinforcement scheme. Results revealed that fear ratings for the CS+ were extinguished in the extinction group but not in the control group. Interestingly, omitting the ITI shocks not only reduced ITI startle responses in the context exposure group compared with the control group, but also reduced the fear ratings and startle responses elicited by the unpredictable CS. The clinical implications of these findings are discussed.
Disc/thermal surgery

Effectiveness of thermal annular procedures in treating discogenic low back pain

Helm S et al. – The evidence is fair for intradiscal electrothermal therapy (IDET) and poor for discTRODE and biacuplasty is being evaluated in 2 ongoing randomized controlled trials.

Methods
The available literature on TAPs in treating discogenic low back pain was reviewed.

The quality assessment and clinical relevance criteria utilized were the Cochrane Musculoskeletal Review Group criteria for interventional techniques for randomized trials, and the criteria developed by the Newcastle–Ottawa Scale criteria for observational studies.

The level of evidence was classified as good, fair, or poor based on the quality of evidence developed by the U.S. Preventive Services Task Force.

Data sources included relevant literature identified through searches of PubMed and EMBASE from 1966 through December 2011, and manual searches of the bibliographies of known primary and review articles.

Results
For this systematic review, 43 studies were identified.

Of these, 3 randomized controlled trials and one observational study met the inclusion criteria.

Using current criteria for successful outcomes, the evidence is fair for IDET and poor for discTRODE and biacuplasty procedures regarding whether they are effective in relieving discogenic low back pain.

Since 2 randomized controlled trials are in progress on that procedure, assessment of biacuplasty may change upon publication of those studies.
Elite Swimmers With Unilateral Shoulder Pain Demonstrate Altered Pattern of Cervical Muscle Activation During a Functional Upper-Limb Task
Ambaro Hidalgo-Lozano, Carmen Calderón-Soto, Antonio Domingo-Camara, César Fernández-de-las-Peñas, Pascal Madeleine, Manuel Arroyo-Morales
DOI: 10.2519/jospt.2012.3875

STUDY DESIGN: Cross-sectional cohort study. OBJECTIVE: To investigate the differences in the level of activation of neck-shoulder muscles between elite swimmers with and without shoulder pain during a functional upper-limb task. BACKGROUND: Previous studies have reported altered motor control of the neck-shoulder muscles in patients with chronic neck-shoulder pain. Whether the activation of neck-shoulder muscles is altered among elite swimmers who have shoulder pain is unknown. METHODS: Surface electromyography from the sternocleidomastoid, upper trapezius, and anterior scalene (SCL) muscles was recorded bilaterally in 17 elite swimmers (9 men, 8 women; mean ± SD age, 21 ± 3 years) with unilateral shoulder pain, and 17 age- and sex-matched elite swimmers without pain. Root-mean-square values were calculated and normalized to assess the level of muscular activation 5 seconds before, 120 seconds into, 150 seconds into, and 10 seconds after a functional upper-limb task. RESULTS: The data revealed significant differences between groups for the root-mean-square of both SCL muscles (F = 3.733, P = .016) but not for the sternocleidomastoid and upper trapezius muscles. Swimmers with shoulder pain had higher normalized root-mean-square values in both SCL muscles at 120 seconds (78% on average) and 150 seconds (86% on average) into the task and at 10 seconds after the task (40% on average), as compared with swimmers without shoulder pain (P<.05). CONCLUSION: The elite swimmers with shoulder pain demonstrated greater activation of the SCL muscles during a functional task and a lower ability to relax the SCL muscles after completion of the task than elite swimmers without shoulder pain. The present findings suggest an altered pattern of cervical muscle activation in elite swimmers with shoulder pain during performance of a functional task.

doi:10.2519/jospt.2012.3875
Knee/patella

Theresa H. Nakagawa, Érika T. U. Moriya, Carlos D. Maciel, Fábio V. Serrão
DOI: 10.2519/jospt.2012.3987

STUDY DESIGN: Controlled laboratory study using a cross-sectional design. OBJECTIVES: To determine whether there are any differences between the sexes in trunk, pelvis, hip, and knee kinematics, hip strength, and gluteal muscle activation during the performance of a single-leg squat in individuals with patellofemoral pain syndrome (PFPS) and control participants.
BACKGROUND: Though there is a greater incidence of PFPS in females, PFPS is also quite common in males. Trunk kinematics may affect hip and knee function; however, there is a lack of studies of the influence of the trunk in individuals with PFPS. METHODS: Eighty subjects were distributed into 4 groups: females with PFPS, female controls, males with PFPS, and male controls. Trunk, pelvis, hip, and knee kinematics and gluteal muscle activation were evaluated during a single-leg squat. Hip abduction and external rotation eccentric strength was measured on an isokinetic dynamometer. Group differences were assessed using a 2-way multivariate analysis of variance (sex by PFPS status).
RESULTS: Compared to controls, subjects with PFPS had greater ipsilateral trunk lean (mean ± SD, 9.3° ± 5.3° versus 6.7° ± 3.0°; P = .012), contralateral pelvic drop (10.3° ± 4.7° versus 7.4° ± 3.8°; P = .003), hip adduction (14.8° ± 7.8° versus 10.8° ± 5.6°; P<.0001), and knee abduction (9.2° ± 5.0° versus 5.8° ± 3.4°; P<.0001) when performing a single-leg squat. Subjects with PFPS also had 18% less hip abduction and 17% less hip external rotation strength. Compared to female controls, females with PFPS had more hip internal rotation (P<.05) and less muscle activation of the gluteus medius (P = .017) during the single-leg squat.
CONCLUSION: Despite many similarities in findings for males and females with PFPS, there may be specific sex differences that warrant consideration in future studies and when clinically evaluating and treating females with PFPS.
KEY WORDS: anterior knee pain, biomechanics, electromyography, patella
Knee/ACL/Quads

Quadriceps Activation Failure After Anterior Cruciate Ligament Rupture Is Not Mediated by Knee Joint Effusion
Andrew D. Lynch, David S. Logerstedt, Michael J. Axe, Lynn Snyder-Mackler
DOI: 10.2519/jospt.2012.3793

STUDY DESIGN: Descriptive prospective cohort study. OBJECTIVES: To investigate the relationships between knee joint effusion, quadriceps activation, and quadriceps strength. These relationships may help clinicians better identify impaired quadriceps activation.

BACKGROUND: After anterior cruciate ligament (ACL) injury, the involved quadriceps may demonstrate weakness. Experimental data have shown that quadriceps activation and strength may be directly mediated by intracapsular joint pressure created by saline injection. An inverse relationship between quadriceps activation and the amount of saline injected has been reported. This association has not been demonstrated for traumatic effusion. We hypothesized that traumatic joint effusion due to ACL rupture and postinjury quadriceps strength would correlate well with quadriceps activation, allowing clinicians to use effusion and strength measurement as a surrogate for electrophysiological assessment of quadriceps activation.

METHODS: Prospective data were collected on 188 patients within 100 days of ACL injury (average, 27 days) referred from a single surgeon. A complete clinical evaluation of the knee was performed, including ligamentous assessment and assessment of range of motion and effusion. Quadriceps function was electrophysiologically assessed using maximal volitional isometric contraction and burst superimposition techniques to quantify both strength and activation.

RESULTS: Effusion grade did not correlate with quadriceps central activation ratio (CAR) (zero effusion: mean ± SD CAR, 93.5% ± 5.8%; trace effusion: CAR, 93.8% ± 9.5%; 1+ effusion: CAR, 94.0% ± 7.5%; 2+/3+ effusion: CAR, 90.6% ± 11.1%). These values are lower than normative data from healthy subjects (CAR, 98% ± 3%).

CONCLUSION: Joint effusion after ACL injury does not directly mediate quadriceps activation failure seen after injury. Therefore, it should not be used as a clinical substitute for electrophysiological assessment of quadriceps activation. Patients presenting to physical therapy after ACL injury should be treated with high-intensity neuromuscular electrical stimulation to help normalize this activation.

doi:10.2519/jospt.2012.3793

KEY WORDS: ACL, effusion, electrophysiological assessment, swelling
Knee/cartilage

Effects of Unloading on Knee Articular Cartilage T1rho and T2 Magnetic Resonance Imaging Relaxation Times: A Case Series
Richard B. Souza, Thomas Baum, Samuel Wu, Brian T. Feeley, Nancy Kadel, Xiaojuan Li, Thomas M. Link, Sharmila Majumdar
DOI: 10.2519/jospt.2012.3975

STUDY DESIGN: Case series. BACKGROUND: It has been shown in rodent and canine models that cartilage composition is significantly altered in response to long-term unloading. To date, however, no in vivo human studies have investigated this topic. The objective of this case series was to determine the influence of unloading and reloading on T1rho and T2 relaxation times of articular cartilage in healthy young joints. CASE DESCRIPTION: Ten patients who required 6 to 8 weeks of non–weight bearing (NWB) for injuries affecting the distal lower extremity participated in the study. Quantitative T1rho and T2 imaging of the ipsilateral knee joint was performed at 3 time points: (1) prior to surgery (baseline), (2) immediately after a period of NWB (post-NWB), and (3) after 4 weeks of full weight bearing (post-FWB). Cartilage regions of interest were segmented and overlaid on T1rho and T2 relaxation time maps for quantification. Descriptive statistics are provided for all changes. OUTCOMES: Increases of 5% to 10% in T1rho times of all femoral and tibial compartments were noted post-NWB. All values returned to near-baseline levels post-FWB. Increases in medial tibia T2 times were noted post-NWB and remained elevated post-FWB. The load-bearing regions showed the most significant changes in response to unloading, with increases of up to 12%. DISCUSSION: The observation of a transient shift in relaxation times confirms that cartilage composition is subject to alterations based on loading conditions. These changes appear to be mostly related to proteoglycan content and more localized to the load-bearing regions. However, following 4 weeks of full weight bearing, relaxation times of nearly all regions had returned to baseline levels, demonstrating reversibility in compositional fluctuations. LEVEL OF EVIDENCE: Therapy, level 4.

doi:10.2519/jospt.2012.3975

KEY WORDS: biomechanics, knee, medical imaging, MRI
Running/post injury

Preinjury and Postinjury Running Analysis Along With Measurements of Strength and Tendon Length in a Patient With a Surgically Repaired Achilles Tendon Rupture
Karin Grävare Silbernagel, Richard W. Willy, Irene S. Davis
DOI: 10.2519/jospt.2012.3913

STUDY DESIGN: Case report. BACKGROUND: The Achilles tendon is the most frequently ruptured tendon, and the incidence of Achilles tendon rupture has increased in the last decade. The rupture generally occurs without any preceding warning signs, and therefore preinjury data are seldom available. This case represents a unique opportunity to compare preinjury running mechanics with postinjury evaluation in a patient with an Achilles tendon rupture. CASE DESCRIPTION: A 23-year-old female sustained a right complete Achilles tendon rupture while playing soccer. Running mechanics data were collected preinjury, as she was a healthy participant in a study on running analysis. In addition, patient-reported symptoms, physical activity level, strength, ankle range of motion, heel-rise ability, Achilles tendon length, and running kinetics were evaluated 1 year after surgical repair. OUTCOMES: During running, greater ankle dorsiflexion and eversion and rearfoot abduction were noted on the involved side postinjury when compared to preinjury data. In addition, postinjury, the magnitude of all kinetics data was lower on the involved limb when compared to the uninvolved limb. The involved side displayed differences in strength, ankle range of motion, heel rise, and tendon length when compared to the uninvolved side 1 year after injury. DISCUSSION: Despite a return to normal running routine and reports of only minor limitations with running, considerable changes were noted in running biomechanics 1 year after injury. Calf muscle weakness and Achilles tendon elongation were also found when comparing the involved and uninvolved sides.

doi:10.2519/jospt.2012.3913

KEY WORDS: Achilles tendon Total Rupture Score (ATRS), biomechanics, heel-rise test
LBP/self evals

Lumbar Computerized Adaptive Test and Modified Oswestry Low Back Pain Disability Questionnaire: Relative Validity and Important Change
Dennis L. Hart, Paul W. Stratford, Mark W. Werneke, Daniel Deutscher, Ying-Chih Wang
DOI: 10.2519/jospt.2012.3942

STUDY DESIGN: Retrospective analysis of longitudinal, observational cohort data.
OBJECTIVES: To compare discriminating ability and minimal clinically important improvement (MCII) calculated using functional status (FS) measures estimated from the lumbar computerized adaptive test (LCAT) and Modified Oswestry Low Back Pain Disability Questionnaire (ODQ). BACKGROUND: The LCAT and ODQ are commonly used to estimate FS in patients seeking outpatient therapy but have not been compared directly. METHODS: Data from 8198 adult patients who completed the LCAT and ODQ at intake were analyzed, 3379 (41%) of whom completed both surveys at discharge. Global ratings of change data were available for 980 patients. Discriminating ability of FS estimates from the LCAT and ODQ was estimated using relative validity, calculated by dividing F values from LCAT and ODQ analyses of covariance for important risk-adjustment variables. MCII was estimated using receiver-operating-characteristic analyses by quartiles of intake FS values, and areas under the curves were compared. RESULTS: Relative validity ratios favored the LCAT for age (3.7; 95% confidence interval [CI]: 2.0, 8.9), acuity (1.3; 95% CI: 1.1, 1.6), comorbidities (1.8; 95% CI: 1.3, 2.6), and surgical history (1.8; 95% CI: 1.2, 2.9). MCII cut scores per quartile favored the LCAT. Receiver-operating-characteristic areas under the curves were not different. CONCLUSION: FS measures estimated by both questionnaires had similar psychometric characteristics. The LCAT FS estimates tended to be more discriminating than ODQ FS estimates. MCII cut scores by quartile of intake FS favored the LCAT. Given the need to be efficient and precise in estimating measures of FS, particularly in older patients, results favor the LCAT in busy, automated outpatient therapy clinics, which are increasingly serving an aging population.

doi:10.2519/jospt.2012.3942

KEY WORDS: computerized adaptive testing, lumbar spine, minimal clinically important difference, Oswestry, relative validity
The Role of Cannabinoids in Inflammatory Modulation of Allergic Respiratory Disorders, Inflammatory Pain and Ischemic Stroke

Authors: Pini, Alessandro; Mannaioni, Guido; Pellegrini-Giampietro, Domenico; Beatrice Passani, Maria; Mastroianni, Rosanna; Bani, Daniele; Masini, Emanuela

Abstract:
This review is intended to offer updated information on the involvement of cannabinoids in the process of inflammation, focusing on immune/allergic reactions, inflammatory pain and neuroinflammation and discussing the interactions among endocannabinoid metabolism, prostanoids and nitric oxide. Two types of cannabinoid receptors, CB1 and CB2, which belong to the G protein-coupled receptor family, have been identified and are targeted by numerous exogenous and endogenous ligands. The activation of CB2 receptors on mast cells has direct antiinflammatory effects, causing decreased release of pro-inflammatory mediators by these cells. The activation of CB1 receptors on bronchial nerve endings has bronchodilator effects by acting on the airway smooth muscle and may be beneficial in airway hyperreactivity and asthma. Moreover, pharmacologic interference with endocannabinoid metabolism has been demonstrated to result in anti-nociceptive activity, mediated by CB1 and CB2 receptors, in animal models of inflammatory pain. The presence of endocannabinoid machinery in the central nervous system, together with high levels of CB1 expression, suggests that the endocannabinoid system is an important modulator of neuroinflammation and a possible drug target. In selected conditions, the activation of CB1 receptors in cerebral blood vessels can have beneficial antiischemic effects. However, as endocannabinoids can also bind to vanilloid receptors, they may also mediate neurotoxic effects.

Keywords: Cannabinoids; cannabinoid receptors; CB1; CB2; endocannabinoids; immune/allergic reaction; inflammatory pain; neuroinflammation; Respiratory Disorders; neurotoxic effects
Complex Regional Pain Syndrome

Skin biopsy in complex regional pain syndrome: case series and literature review Full Text
Kharkar S et al. – The negative results indicate that CRPS–I may be associated with changes in the ultramicroscopic small fiber structure that cannot be visualized with commercially available techniques. Alternatively, functional rather than structural alterations of small fibers or pathological changes at a more proximal site such as the spinal cord or brain may be responsible for the syndrome.

Methods
Retrospective review of charts and laboratory data.

Outpatient clinic.

Skin biopsies from 43 patients with CRPS–I were stained with PGP 9.5, and epidermal nerve fiber density, sweat gland nerve fiber density and morphological abnormalities were evaluated.

Thirty–five patients had quantitative sensory testing.

Results
Alterations in skin innervation were seen in approximately 20% of CRPS–I patients with commercial processing.

There were no patient characteristics, including duration of disease, that predicted a decreased epidermal nerve fiber density (ENFD).

There was no consistent relationship between QST changes and ENFD measured by standard commercial skin biopsy evaluation procedures.
C spine/stimulators

Cervical spinal cord stimulation: an analysis of 23 patients with long-term follow-up: retrospective study Full Text Pain Physician, 06/05/2012
Wolter T et al. – Cervical spinal cord stimulation appears to be effective in the treatment of neuropathic upper limb pain. Complications are not significantly more frequent than in SCS for lower limb pain. Changes in paresthesia with head movements and unwanted paresthesia did not affect the outcome.

Methods
Authors reviewed the records of patients who had been treated at this institution with cervical neurostimulators from November 1, 2001 through October 31, 2011.

Information regarding age, gender, diagnosis, age at time of implantation, duration of disease, lead position, hardware in use, revision operations, and stimulation parameters were recorded.

In addition, a short telephone interview was conducted, which contained the following items: pain scores on the numeric analog scale (NAS) with and without stimulation, time intervals of stimulation, paresthesia coverage, changes in paresthesia coverage by head movements, unwanted paresthesia of the trunk and legs, treatment satisfaction, and medication intake.

Results
23 patients were treated.

Eighteen patients proceeded to an implantable pulse generator (IPG) implant.

In one patient, the system was removed after 4 years despite optimal function, because the patient was no longer experiencing pain.

Average NAS pain scores were 6.8 (range 5.5 – 10.0, standard deviation [SD] 1.7) without, and 2.8 (range 0 – 7.5, SD 2.2) with neurostimulation.

Fourteen revisions (5 due to lead dislocation, 5 due to lead breakage and 4 IPG revisions) were necessary in 9 of the 18 patients during a mean follow–up of 6.2 years.

Most patients reported complete paresthesia coverage.

Four patients reported unwanted paresthesia of the trunk or lower limb and 11 patients reported changes in paresthesia with head movements.

In both instances, pain reduction was not affected.
Discography

The impact of discography on the surgical decision in patients with chronic low back pain

The Spine Journal, 06/05/2012  Clinical Article Berg S et al. –

Purpose

This study was aimed at highlighting how discography affects surgical decisions when performed on one of four different indications in a complicated subgroup of patients with chronic low back pain assumed to be associated with degenerative disc disease (DDD).

Patient sample

One hundred thirty-eight patients admitted to a spine clinic more than 4 years with the DDD diagnosis (15% of all) were referred for discography because it was considered that medical history, clinical findings, and magnetic resonance imaging (MRI) were insufficient to make a final assessment on whether to propose surgery/recommend against surgery or what segments to operate on.

Methods

Before these patients were referred to provocative discography, the surgeon had to select one of four alternative questions/indications being the reason for the discography and choose what decision would have been made if discography would not have been available. The questions/indications were as follows: surgery decided discography to establish whether to treat adjacent segment as well (n=17); several segments degenerated on MRI, pain likely to be discogenic, discography to evaluate what segments to treat (n=56); uncertainty whether pain is discogenic but one suspected segment on MRI (n=38); uncertainty whether pain is discogenic and several segments degenerated in MRI (n=27); the decision after discography was then compared with the prediscography decision and the changes affected by the result of the discography were analyzed.

Results

Changes were made to the prediscography decision in 71% of the patients in total. When the surgeon was assured that the pain was discogenic, one segment was added or subtracted in 58% of the patients compared with original prediscography decision. When the surgeon was uncertain if pain was discogenic, the final decision changed from surgery to no surgery in 8%, from no surgery to surgery in 42%, and in cases that were planned for surgery prediscography, one segment was added or subtracted in 17% of the patients. The more certain the surgeon was before discography that the patient's pain was indeed discogenic, the fewer changes between surgical treatment and no surgical treatment took place. The more uncertain the surgeon was before discography that the patient's pain was discogenic, the fewer changes in segments to treat took place in patients who went on to surgery. Changes of involved segments were made to all the 27 patients with a preliminary decision for surgical treatment of the L5–S1 segment solely. The corresponding figure for L4–L5 and L4–L5–S1 was 70% and 53%, respectively.

Conclusions

A high frequency of decisions was altered in this group of surgeons when using discography as an additional examination in patients where uncertainty remains in how to treat after clinical examination, questioning, and MRI.
Fibromyalgia

The association between overactive bladder and fibromyalgia syndrome: A community survey

Neurourology and Urodynamics, 06/06/2012 Clinical Article

Chung JH et al. – Overactive bladder (OAB) is associated with fibromyalgia syndrome (FMS). Moreover FMS increases with severity of OAB.

Methods

A survey of adults aged 40s and over was conducted in the Guri and Yangpyeong areas of South Korea.

The response rate was 74.2% (940/1,266).

After excluding subjects with incomplete questionnaires (n = 20), 920 were included in the final analysis.

The association of FMS and OAB was analyzed by univariate and multivariate logistic regression analysis.

Results

Individuals with FMS had a significantly increased symptoms of OAB after adjustment for gender, age group, and area of residence (odds ratio (OR) 3.39, 95% confidence interval (CI) 1.82–6.31).

The association between FMS and severity of OAB was statistical significant (P for trend <0.0001).
Pain/menstrual cycle

The Influence of Menstrual Phases on Pain Modulation in Healthy Women.
Rezaii T, Hirschberg AL, Carlström K, Ernberg M.
Source
Department of Dental Medicine, Section for Orofacial Pain and Jaw Function, Karolinska Institutet, Huddinge, Sweden.

Abstract
This study investigated if conditioned pain modulation (CPM) varies across the menstrual cycle in healthy, normally menstruating women and investigated correlations between sex hormone levels and CPM across the menstrual cycle. Thirty-six normally menstruating women were tested during 3 phases of the menstrual cycle: early follicular, ovulatory, and midluteal, confirmed by hormone determinations. Mechanical pressure (test stimulus) was applied to the masseter muscle and the induced pain assessed before, during, and after immersion of the hand into ice water (conditioning stimulus) to activate CPM or tepid water (control). Conditioning pain, ie, pain in the hand during CPM/control experiment, and tolerance time were also measured. Test pain intensity was suppressed during CPM in all phases (P < .001), but with more effective suppression during the ovulatory phase than during the early follicular phase (P < .05). There were no changes in test pain intensity during the control experiment and no significant differences in conditioning pain, or tolerance time between phases. In conclusion, our results showed more effective pain modulation in the ovulatory phase of the menstrual cycle, when estradiol levels are high and progesterone levels are low, than in the early follicular phase when both these hormones are low. PERSPECTIVE: Deficient pain modulation is believed to be an important pathogenic factor in many chronic pain conditions that affect women. This article shows that sex hormones modulate conditioned pain modulation, because pain inhibition was more effective in the ovulatory phase of the menstrual cycle than in the early follicular phase.

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Pain/Cannabis

Cannabinoids suppress inflammatory and neuropathic pain by targeting α3 glycine receptors.


Source
Laboratory for Integrative Neuroscience, National Institute on Alcohol Abuse and Alcoholism, and 2 Chemical Biological Research Branch, National Institute on Drug Abuse, National Institutes of Health, Bethesda, MD 20892.

Abstract
Certain types of nonpsychoactive cannabinoids can potentiate glycine receptors (GlyRs), an important target for nociceptive regulation at the spinal level. However, little is known about the potential and mechanism of glycinergic cannabinoids for chronic pain treatment. We report that systemic and intrathecal administration of cannabidiol (CBD), a major nonpsychoactive component of marijuana, and its modified derivatives significantly suppress chronic inflammatory and neuropathic pain without causing apparent analgesic tolerance in rodents. The cannabinoids significantly potentiate glycine currents in dorsal horn neurons in rat spinal cord slices. The analgesic potency of 11 structurally similar cannabinoids is positively correlated with cannabinoid potentiation of the α3 GlyRs. In contrast, the cannabinoid analgesia is neither correlated with their binding affinity for CB1 and CB2 receptors nor with their psychoactive side effects. NMR analysis reveals a direct interaction between CBD and S296 in the third transmembrane domain of purified α3 GlyR. The cannabinoid-induced analgesic effect is absent in mice lacking the α3 GlyRs. Our findings suggest that the α3 GlyRs mediate glycinergic cannabinoid-induced suppression of chronic pain. These cannabinoids may represent a novel class of therapeutic agents for the treatment of chronic pain and other diseases involving GlyR dysfunction.

PMID: 22585736 [PubMed - in process]
Effect of Core Stability Exercises on Feed-Forward Activation of Deep Abdominal Muscles in Chronic Low Back Pain: A Randomized Controlled Trial — Spine, 06/06/2012 Clinical Article

Vasseljen O et al. – Abdominal muscle onset was largely unaffected by 8 weeks of exercises in chronic low back pain (LBP) patients. There was no association between change in onset and LBP. Large individual variations in activation pattern of the deep abdominal muscles may justify exploration of differential effects in subgroups of LBP.

Methods
Subjects (N = 109) with chronic nonspecific LBP of at least 3 months' duration were randomly assigned to 8 weekly treatments with low–load core stability exercises, high–load stabilizing exercises in slings, or general exercises in groups.

Primary outcome was onset recorded bilaterally by m–mode ultrasound imaging in the deep abdominal muscles in response to rapid shoulder flexion.

Results
No or small changes were found in onset after treatment.

Baseline adjusted between group differences showed a 15 ms (95% confidence interval [CI], 1–28; P = 0.03) and a 19 ms (95% CI, 5–33; P < 0.01) improvement with sling relative to core stability and general exercises, respectively, but on 1 side only.

There was no association between changes in pain and onset over the intervention period (R2 ≤ 0.02).
Osteopathic manipulative treatment in obese patients with chronic low back pain: A pilot study – Manual Therapy, 06/07/2012
Vismara L et al. – Combined rehabilitation treatment including Osteopathic Manipulative Treatment (OMT + SE) showed to be effective in improving biomechanical parameters of the thoracic spine in obese patients with cLBP. Such results are to be attributed to osteopathic manipulative treatment (OMT), since they were not evident in the specific exercises (SE) group. Authors also observed a reduction of disability and pain. The clinical results should be considered preliminary due to the small sample size.

Methods
Nineteen obese females with cLBP, randomized into 2 groups: SE + OMT and SE were studied during the forward flexion of the spine using an optoelectronic system.

A biomechanical model was developed in order to analyse kinematics and define angles of clinical interest.

Kinematic of the thoracic and lumbar spine and pelvis during forward flexion, pain according to a visual analogue scale (VAS), Roland Morris Disability Questionnaire and Oswestry Low Back Pain Disability Questionnaire.

Results
Significant effects on kinematics were reported only for OMT + SE with an improvement in thoracic range of motion of nearly 20%.

All scores of the clinical scales used improved significantly.

The greatest improvements occurred in the OMT + SE group.
Temporal summation of pain is not amplified in a large proportion of fibromyalgia patients

Potvin S et al. – These results suggest that temporal summation of pain is normal, rather than increased, in a large proportion of fibromyalgia (FM) patients. Future studies on temporal summation in FM will need to be careful since some FM patients require abnormally low experimental temperatures that may confound results and make necessary to separate patients into subgroups.

Methods

72 female FM patients and 39 healthy females participated in the study.

The temporal summation test consisted of a 2–minute continuous and constant heat pulse administered with a thermode on the participants’ left forearm.

Experimental temperature was set at a value individually predetermined to induce a 50/100 pain rating.

Results

Relative to controls, FM patients had lower thermal pain thresholds and lower temporal summation of pain.

However, 37 FM patients required experimental temperatures lower than the minimal temperature used in controls (45°C).

Nevertheless, temporal summation was not increased in the other FM subgroup, relative to controls, despite equivalent experimental temperatures.
Attention to pain and fear of pain in patients with chronic pain.

Crombez G, Viane I, Eccleston C, Devulder J, Goubert L.

Source

Department of Experimental Clinical and Health Psychology, Ghent University, H. Dunantlaan 2, 9000, Ghent, Belgium, geert.crombez@ugent.be.

Abstract

To investigate how acceptance of illness affects chronic pain in terms of attention towards pain and fearful thinking of pain. 62 participants (50 women) with chronic pain carried a palmtop computer for 2 weeks. Eight times each day auditory signals were delivered to cue participants to complete questions about their experience. Multilevel analyses indicated that on moments with more intense pain, more fearful thinking about pain, and less positive emotions, attention to pain was increased. Illness acceptance did not moderate the relation between pain intensity and attention to pain. Results further indicated that on moments with more intense pain, more negative emotions, and less positive emotions, fearful thinking about pain was increased. Of particular interest was the finding that the relationship between pain intensity and fearful thinking about pain was less strong for those high in acceptance. Pain captures attention and elicits fearful thinking about pain. Acceptance may be a useful avenue to lower negative thinking about pain, and to increase well-being in patients with chronic illnesses.

PMID: 22614260 [PubMed - as supplied by publisher]
Gender differences in both active and passive parts of the plantar flexors series elastic component stiffness and geometrical parameters of the muscle-tendon complex.

Fouré A, Cornu C, McNair PJ, Nordez A.

Source
Laboratoire Motricité, Interactions, Performance-EA 4334, UFR STAPS, Université de Nantes, 25 bis Bd Guy Mollet, 44 322 Nantes cedex 3, France.

Abstract
Men are reportedly at higher risk of plantar flexor muscle injury and Achilles tendon ruptures than women. Biomechanical parameters are thought to play a role in the higher frequency of injury to males. One parameter is the stiffness of tissues; a stiff tissue cannot absorb sufficient energy with loading, and subsequently may be more likely to be injured. Thus, our purpose was to investigate the gender difference in the geometrical parameters of plantar flexor's muscle-tendon complex and the stiffness of both active and passive parts of the series elastic component (S(SEC1) and S(SEC2), respectively). Using the alpha method on data obtained from quick stretches to the plantar flexors performed during isometric contractions, S(SEC1) and S(SEC2) were assessed. Plantar flexor muscles and Achilles tendon cross-sectional areas (CSA(TS) and CSA(AT), respectively) were determined in young healthy men (n = 49) and women (n = 31). The findings showed that S(SEC2) was higher in men (p < 0.001), but this difference was not apparent when S(SEC2) was normalized to CSA(AT) (p > 0.05). In contrast, S(SEC1) was lower in men (p < 0.001) and remained so after normalization to CSA(TS). Higher joint stiffness observed in men was notably influenced by lever arm length. Thus, the results of this study have implications for performance and injury.

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PMID: 22034230 [PubMed - indexed for MEDLINE]
The anterior shear and distraction tests for craniocervical instability. An evaluation using magnetic resonance imaging.

Osmotherly PG, Rivett DA, Rowe LJ.

School of Health Sciences, The University of Newcastle, Callaghan, NSW 2308, Australia.

Abstract
Screening for integrity of the ligaments of the craniocervical complex has been suggested prior to the application of manual techniques to the upper cervical spine. However, most tests proposed lack validation limiting their usefulness clinically. This study examined the effect of the anterior shear test for the transverse ligament and the distraction test for the tectorial membrane in normal volunteers. MRI was performed in supine in neutral and end-range stress test positions in 16 individuals using proton density-weighted sequences and a standard head coil in a 3-T system. Measurements were made with respect to a strictly standardised protocol. The anterior shear test was assessed using changes in atlantodental interval and distance from the anterior arch of the atlas to the posterior aspect of the odontoid process. Distraction testing for the tectorial membrane was assessed by changes in basion-dental interval and by direct measurement of the tectorial membrane. Differences were compared using Wilcoxon Sign Rank tests or paired t-test depending upon each variables assessment of normality. Anterior shear testing resulted in a 0.41 mm mean increase in atlantodental interval (p = 0.03) and 0.35 mm mean increase in axial plane distance (p = 0.05). Distraction testing for the tectorial membrane resulted in a 0.64 mm increase in basion-dental interval (p < 0.01) and a 1.11 mm increase in direct ligament length measurement (p = 0.02). Reliability of measurements ranged from moderate to substantial. These results indicate that these tests produce a consistent direct effect on the transverse ligament and the tectorial membrane which is consistent with their theorised mechanism for clinical use.

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PMID: 22560165 [PubMed - as supplied by publisher]

Ha TH, Saber-Sheikh K, Moore AP, Jones MP.

Source
Clinical Research Centre for Health Professions, University of Brighton, Aldro Building, 49 Darley Road, Eastbourne BN20 7UR, East Sussex, UK.

Abstract
Measurement of spinal lumbar range of movement is useful in clinical examination of the spine and for monitoring changes in spinal movement characteristics of individuals over time, particularly in the research context. As the spine exhibits six degrees of movement, three dimensional measurements provide additional information that could benefit the study of spinal conditions. Inertial measurement systems present an innovative method of spinal motion measurement. These systems are small and portable, and of low cost compared to laboratory based three dimensional measurement systems such as electromagnetic and opto-electronic systems. The present study aimed to validate the use of inertial measurement systems in three dimensional spinal range of movement measurement using an electromagnetic tracking system as a reference. Twenty-six healthy participants had their lumbar spine range of movement measured using both an inertial measurement system and an electromagnetic tracking system. Measurements taken by the inertial measurement system were found to be highly correlated with the electromagnetic tracking system (overall regression $R^2$ 0.999, $p < 0.005$). Measurements showed strong agreement (mean differences between -0.81° and 1.26°) and produced no significant difference from the electromagnetic tracking system (paired t-test $p > 0.05$). The ranges of movement measured were also highly comparable to those reported in the literature. Inertial measurement systems that consist of triaxial gyroscopes, accelerometers and magnetometers are concluded to be valid tools for three dimensional spinal range of movement measurement within or outside of the laboratory settings due to their cost, size and portability.

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PMID: 22575288 [PubMed - as supplied by publisher]
The craniocervical flexion test: An investigation of performance in young asymptomatic subjects.


Source
Trinity College Dublin Discipline of Physiotherapy, Trinity Centre for Health Sciences, St. James's Hospital, Dublin 8, Ireland; Department of Physiotherapy, Adelaide and Meath Hospital, Incorporating the National Children's Hospital, Tallaght, Dublin 24, Ireland.

Abstract
INTRODUCTION:
The Deep Cervical Flexors (DCF) provide support and segmental stability to the cervical spine. However, their endurance capacity can be reduced in cervicogenic disorders. The Craniocervical Flexion Test (CCFT) is regarded as the most effective means of assessing the contractile performance of these muscles. However, limited normative data exists to serve as a reference point during diagnosis.

AIM:
This study examined CCFT performance in a group of young asymptomatic subjects and investigated the influence of physical activity levels, age and gender on CCFT score.

METHOD:
The most recent CCFT protocol as described by Jull et al. (2008) was used. Baseline assessment scores along with certain patient characteristics were recorded on one occasion.

RESULTS:
For testing, 34 asymptomatic subjects were recruited (24 females, 10 males with a mean age of 21.5 ± 2.15 years). The median baseline assessment score was 24 mmHg (interquartile range = 3). Physical activity levels, age or gender did not significantly correlate with DNF endurance (P > 0.05).

CONCLUSION:
The Median Baseline Assessment score was 24 mmHg (interquartile range = 3). Between-subject variability was high while physical activity levels; age or gender did not appear to influence the DCF muscle tonic holding capacity. The small heterogeneous sample involved in this study highlights the need for high quality normative studies to validate these findings.

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PMID: 22626765 [PubMed - as supplied by publishe
Lumbar

Effects of muscular stretching and segmental stabilization on functional disability and pain in patients with chronic low back pain: a randomized, controlled trial

Franca FR et al. – Both techniques improved pain and reduced disability. In this study, stabilization group (SS) was superior to muscular stretching for the measured variables associated with chronic low back pain.

Methods
A total of 30 participants were enrolled in this study and randomly assigned to 1 of 2 groups as a function of intervention.

In the segmental stabilization group (SS), exercises focused on the TrA and lumbar multifidus muscles, whereas in the stretching group (ST), exercises focused on stretching the erector spinae, hamstrings, and triceps surae.

Severity of pain (visual analog scale and McGill pain questionnaire) and functional disability (Oswestry disability questionnaire) and TrA muscle activation capacity (Pressure Biofeedback Unit, or PBU) were compared as a function of intervention.

Interventions lasted 6 weeks, and sessions happened twice a week (30 minutes each).

Analysis of variance was used for intergroup and intragroup comparisons.

Results
As compared with baseline, both treatments were effective in relieving pain and improving disability (P < .001).

Those in the SS group had significantly higher gains for all variables.

The stretching group did not effectively activate the TrA (P = .94).
C spine

Effect of adding cervical facet joint injections in a multimodal treatment program for long-standing cervical myofascial pain syndrome with referral pain patterns of cervical facet joint syndrome

Journal of Anesthesia, 06/08/2012
Park SC et al. – Addition of therapeutic cervical facet joint (CFJ) injections to a multimodal treatment program is a useful therapeutic modality for patients, especially young patients, suffering from long–standing myofascial pain syndrome (MPS) with referral pain of CFJ syndrome.

Methods
Four hundred patients presented with long–standing cervical MPS with referral pain patterns of CFJ syndrome over a period of 6 months.

A randomized clinical trial was performed wherein 200 patients (group 1) received therapeutic CFJ injections at bilateral C5/C6 and C6/C7 after diagnostic, controlled double–blind blocks.

The same cointerventions, such as medication and a home exercise program, were simultaneously applied to patients in group 1 and the noninjection group (group N).

Cervical range of motion (CROM), mean reduction of numeric rate scale (NRS) for pain, and comorbid tension–type headache were compared between groups during the 1–year follow–up period.

Treatment duration and symptom–free periods were compared according to age group.

Results
Group 1 showed increased CROM, increased mean NRS pain reduction, and decreased incidence of combined tension–type headache compared with group N during the follow–up.

Younger patients in group 1 required a shorter treatment cycle and experienced a longer symptom–free period.
**Headache**

*Prospective analysis of factors related to migraine aura - the pamina study* — *Headache: The Journal of Head and Face Pain, 06/11/2012*

Salhofer–Polanyi S et al. – Menstruation is the most prominent factor increasing the risk of aura as well as that of HoA and MoA. Smoking shows the most striking difference increasing the risk of aura, but decreasing the risk of HoA and MoA.

**Methods**

Of 327 patients with migraine completing a comprehensive diary up to 90 days, authors selected all patients who recorded at least 1 episode of migraine aura.

To find risk indicators and triggers of aura, HoA, and MoA, authors analyzed 56 variables and calculated univariate and multivariate generalized linear mixed models.

**Results**

Fifty-four patients recorded a total of 4562 patient days including 354 days with migraine aura.

In the multivariate analysis, the risk of aura was statistically significantly increased by smoking, menstruation, and hunger, and it was decreased by holidays and days off.

The risk of HoA and/or MoA was increased during menstruation, by psychic tension, tiredness, and odors, and it was decreased by smoking.
Fluoroscopic caudal epidural injections with or without steroids in managing pain of lumbar spinal stenosis: one-year results of randomized, double-blind, active-controlled trial

Methods

100 participants were randomly assigned to 1 of the 2 groups, with Group I participants receiving caudal epidural injections of local anesthetic (lidocaine 0.5%), whereas Group II participants received caudal epidural injections with 0.5% lidocaine 9 mL mixed with 1 mL of steroid (nonparticulate Celestone).

Outcomes Assessment: Multiple outcome measures were used, including the Numeric Rating Scale (NRS), the Oswestry Disability Index 2.0 (ODI), employment status, and opioid intake with assessment at 3, 6, and 12 months posttreatment.

Results

Overall, significant pain relief and functional status improvement (≥50%) were demonstrated in 48% in Group I and 46% in Group II.

However, significant pain relief and functional status improvement were seen in 60% of the participants in both groups in the successful category when the participants were separated into successful and failed categories.

The overall number of procedures was 3.1±1.3 or 3.6±1.1 in the successful category in Group I, with overall 2.9±1.4 or 3.5±1.2 in the successful category in Group II.
Migraine


Pathogenesis of Migraine: Role of Neuromodulators.

D'Andrea G, D'Arrigo A, Dalle Carbonare M, Leon A.

Source

From the Research and Innovation S.p.A., Padua, Italy.

Abstract

The pathogenesis of migraine is still, today, a hotly debated issue. Recent biochemical studies report the occurrence in migraine of metabolic abnormalities in the synthesis of neurotransmitters and neuromodulators. These include a metabolic shift directing tyrosine metabolism toward the decarboxylation pathway, therein resulting in an unphysiological production of noradrenaline and dopamine along with increased synthesis of traces amines such as tyramine, octopamine, and synephrine. This biochemical alteration is possibly favored by impaired mitochondrial function and high levels of glutamate in the central nervous system (CNS) of migraine patients. The unbalanced levels of the neurotransmitters (dopamine and noradrenaline) and neuromodulators (eg, tyramine, octopamine, and synephrine) in the synaptic dopaminergic and noradrenergic clefts of the pain matrix pathways may activate, downstream, the trigeminal system that releases calcitonin gene-related peptide. This induces the formation of an inflammatory soup, the sensitization of first trigeminal neuron, and the migraine attack. In view of this, we propose that migraine attacks derive from a top-down dysfunctional process that initiates in the frontal lobe in a hyperexcitable and hypoenergetic brain, thereafter progressing downstream resulting in abnormally activated nuclei of the pain matrix.

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Dynamic changes of elasticity, cross-sectional area, and fat infiltration of multifidus at different postures in men with chronic low back pain

Chan ST et al.

Background context
Multifidus cross-sectional area was often measured in chronic low back pain (LBP) patients to estimate the muscle activity for spinal stability. However, such estimation may be inadequate as the contribution of muscle elasticity in muscle activity is ignored. In vivo quantitative data on multifidus elasticity is therefore important for the study of muscle contractile function in response to motor control for spinal stability in chronic LBP patients.

Purpose
The purpose of this study was to quantify the elasticity, cross-sectional area, and fat area of the multifidus for the contractile function and the distribution of deformable muscle tissue and nondeformable fat tissue at different postures in patients with and without chronic LBP.

Patient sample
The sample comprised 12 adult male patients with chronic LBP and 12 asymptomatic male controls.

Outcome measures
The outcome measure was the elasticity of the multifidus at the L4 level for the assessment of muscle contractile function when patients were in the prone, upright, and 25° and 45° forward stooping positions. The cross-sectional area and fat area were also measured on the B-mode ultrasound images of the multifidus acquired at the same vertebral level and the postures.

Methods
With the patients in each of the prone, upright, and 25° and 45° forward stooping positions, ultrasound elastography and B-mode ultrasound imaging were performed on the left and right multifidus at the L4 level. The elasticity of multifidus indicated by the effective Young’s modulus was derived from the force-deformation data acquired using ultrasound elastography. The cross-sectional area and fat area were assessed on the B-mode ultrasound images. The effective Young’s modulus, cross-sectional area, and fat area were analyzed with multivariate general linear model analysis to investigate the possible effects of LBP and posture.

Results
There was an increasing stiffness of multifidus demonstrated by increasing effective Young’s modulus from the prone to upright position and 25° and 45° forward stooping positions. Differences in multifidus stiffness between chronic LBP patients and asymptomatic controls were shown in the upright and 25° and 45° forward stooping positions but not in the prone position. The cross-sectional area of the multifidus increased from the prone position to the greatest value in the upright position and decreased in 25° and 45° forward stooping positions. Smaller multifidus cross-sectional area was demonstrated in chronic LBP patients than that in controls at all postures. No effect of posture on fat area within the multifidus was shown although the fat area within the multifidus was larger in chronic LBP patients.

Conclusions
Different, changing patterns of elasticity and cross-sectional area were identified in the multifidus in relation to posture. Increased stiffness of multifidus in response to the physiologic range of static loads and...
A smaller cross-sectional area was characterized in the chronic LBP condition for spinal stability. Ultrasound elastography offers in vivo assessment of muscle contractile function of deep trunk muscles, which benefits the future investigation of the neuromuscular regulating mechanism in LBP. It can also be applied to refine the palpatory skill for the physical assessment in sports training and physical therapy.

**LBP**

**Centralization and directional preference: A systematic review**

*Manual Therapy*, 06/14/2012

May S et al. – Findings of centralization or directional preference at baseline would appear to be useful indicators of management strategies and prognosis, and therefore warrant further investigation.

Centralization is a symptom response to repeated movements that can be used to classify patients into sub-groups, determine appropriate management strategies, and prognosis. The aim of this study was to systematically review the literature relating to centralization and directional preference, and specifically report on prevalence, prognostic validity, reliability, loading strategies, and diagnostic implications. Search was conducted to June 2011; multiple study designs were considered. 62 studies were included in the review; 54 related to centralization and 8 to directional preference. The prevalence of centralization was 44.4% (range 11%–89%) in 4745 patients with back and neck pain in 29 studies; it was more prevalent in acute (74%) than sub-acute or chronic (42%) symptoms. The prevalence of directional preference was 70% (range 60%–78%) in 2368 patients with back or neck pain in 5 studies. Twenty-one of 23 studies supported the prognostic validity of centralization, including 3 high quality studies and 4 of moderate quality; whereas 2 moderate quality studies showed evidence that did not support the prognostic validity of centralization. Data on the prognostic validity of directional preference was limited to one study. Centralization and directional preference appear to be useful treatment effect modifiers in 7 out of 8 studies. Levels of reliability were very variable (kappa 0.15–0.9) in 5 studies. Findings of centralization or directional preference at baseline would appear to be useful indicators of management strategies and prognosis, and therefore warrant further investigation.
LBP/Opioids

**Relationship of negative affect and outcome of an opioid therapy trial among low back pain patients** □Pain Practice, 06/13/2012 □Clinical Article
Jamison RN et al. – Negative affect is associated with diminished benefit during a trial of opioid therapy and is predictive of dropout in a controlled clinical trial.

**Methods**
Four hundred fifty-nine (N = 459) patients participated in the titration/conversion phase of a multicenter study, of which 268 were randomized to receive once-daily hydromorphone or placebo.

All patients completed the Hospital Anxiety and Depression Scale (HADS) at baseline and were divided evenly into Low (N = 157), Moderate (N = 155), and High (N = 147) negative affect groups based on their scores.

Group differences in numerical pain intensity measures at home and in the clinic, Roland–Morris Disability ratings, and measures of symptoms from the Subjective Opiate Withdrawal Scale (SOWS) throughout the trial were analyzed.

**Results**
Two hundred sixty-eight of the initial 459 subjects who entered the 2 to 4-week titration/conversion phase (pretreatment) were successfully randomized to either placebo or ER hydromorphone; a total of 110 patients then completed this double-blind phase of the study.

Those in the Moderate and High negative affect groups tended to drop out more often during the titration/conversion phase because of the adverse effects or lack of efficacy of their prescribed opioid than those in the Low negative mood group (P < 0.05).

Overall, those patients in the Moderate and High groups reported significantly higher pain intensity scores in at-home and in-clinic pain intensity ratings (P < 0.05), greater disability on the Roland–Morris Scale (P < 0.01), and more withdrawal symptoms on the SOWS (P < 0.05) than those in the Low group.

Higher negative affect scores also predicted less favorable ratings of the study drug during the titration phase (P < 0.05).

Interestingly, the High negative affect group showed the most improvement in pain in the placebo condition (P < 0.05).
Physiotherapists' knowledge, attitudes, and intolerance of uncertainty influence decision making in low back pain

Simmonds MJ et al. – Health care practitioners play a significant role in the management of low back pain (LBP). Research on the process of knowledge translation, clinical decision making, and dealing with uncertainty to avoid aggravating LBP disability is clearly warranted.

Methods

A total of 108 PTs from Quebec, Canada completed the Pain Attitudes and Beliefs Scale for Physiotherapists, the Fear of Pain Questionnaire, and the Intolerance of Uncertainty Scale.

Participants also read 2 vignettes that described patients with LBP and reported their assessment and treatment recommendations.

Results

Only 13 PTs (12%) were able to identify clinical practice guidelines for LBP.

In addition, PTs did not generally agree with recommendations to return to work or activity.

A biomedical orientation was a significant predictor of clinical judgments of spinal pathology and was associated with an increased sense of IU.

In contrast, a behavioral approach better predicted treatment recommendations for return-to-work or activity.

Finally, the association between IU and treatment decisions was mediated by treatment orientation.
LBP/back school

Psychological features and outcomes of the Back School treatment in patients with chronic non-specific low back pain. A randomized controlled study  

European Journal of Physical and Rehabilitation Medicine, 06/13/2012
Paolucci T et al. – The results suggest that Back School program has positive effects, even in terms of mental components of quality of life in patients with scale elevations of MMPI–II. Probably these findings are due to its educational and cognitive–behavioural characteristics.

BACKGROUND: Low back pain is a worldwide health problem, affecting up to 80% of adult population. Psychological factors are involved in its development and maintenance. Many clinical trials have evaluated the efficacy of different interventions for chronic non-specific low back pain. In this field, Back School program has been demonstrated effective for people with chronic non-specific low back.

AIM: To evaluate the relationship between the effects of the Back School treatment and psychological features measured by MMPI-II of patients with chronic non-specific low back pain.

DESIGN: A randomised controlled trial with three and six-month follow-up.

SETTING: Ambulatory rehabilitative university centre.

POPULATION: Fifty patients with chronic non-specific low back pain out of 77 screened patients.

METHODS: Patients were randomly placed in a 3:2 form and were allocated into two groups (Treatment versus Control). The Treatment Group participated to an intensive multidisciplinary Back School program (BSG, N.=29), while the Control Group received medical assistance (CG, N.=21). Medication was the same in both groups. Then, patients were subgrouped in those with at least an elevation in one scale of MMPI-II, and those without it. The Short Form 36 Health Status Survey for the assessment of quality of life (primary outcome measure), pain Visual Analogue Scale, Waddel Index and Oswestry Disability Index were collected at baseline, at the end of treatment, and at the three and six-month follow-up.

RESULTS: Only the two treated subgroups showed a significant improvements in terms of quality of life, disability and pain. Among treated subjects, only those with at least one scale elevation in MMPI-II showed also a significant improvement in terms of Short Form 36 mental composite score and relevant subscores.

CONCLUSION: These results suggest that Back School program has positive effects, even in terms of mental components of quality of life in patients with scale elevations of MMPI-II. Probably these findings are due to its educational and cognitive-behavioural characteristics.

CLINICAL REHABILITATION IMPACT: Because of its educational purposes, the Back School treatment can have positive effects also on the mental status of patients with low back pain when it affects their psychological features.

language: English
Comparing Pain Modulation and Autonomic Responses in Fibromyalgia and Irritable Bowel Syndrome Patients

Chalaye P et al. – The results confirm the presence of graded levels of somatic hyperalgesia across patients with irritable bowel syndrome (IBS) and fibromyalgia (FM). A similar pattern of result was observed for pain inhibitory dysfunctions. These pain processing changes were accompanied by abnormal autonomic responses, which maintained patients (principally patients with FM) in a state of sympathetic hyperactivity. Results suggest that patients with IBS and FM may present common, but graded, pain processing and autonomic dysfunctions.

Objectives: Past studies confirm that patients with fibromyalgia (FM) and irritable bowel syndrome (IBS) show similar pain processing dysfunctions, such as reduced pain inhibition and aberrant autonomic nervous system (ANS) responses. However, patients with FM and IBS have rarely been investigated in the same study. The aim of the present study, therefore, was to compare descending pain inhibition, pain sensitivity, and ANS reactivity to pain in FM, IBS, and healthy controls (HC).

Methods: Female patients with FM (n=10), IBS (n=13), and HCs (n=10) were exposed to multiple cold water (12°C) immersions to study pain sensitivity and descending pain inhibition. Heart rate variability was also assessed during immersions.

Results: Pain intensity scores were highest in FM, intermediate in IBS, and smallest in HCs. In contrast, pain inhibition was absent in FM, intermediate in IBS, and strongest in HCs. Importantly, controlling for differences in pain inhibition abolished group differences in pain sensitivity. Heart rate variability analyses confirmed that, in response to mild levels of pain, patients with FM showed greater sympathetic activity whereas HCs showed greater parasympathetic activity. Patients with IBS showed intermediate ANS responses.

Discussion: Our results confirm the presence of graded levels of somatic hyperalgesia across patients with IBS and FM. A similar pattern of result was observed for pain inhibitory dysfunctions. These pain processing changes were accompanied by abnormal autonomic responses, which maintained patients (principally patients with FM) in a state of sympathetic hyperactivity. Results suggest that patients with IBS and FM may present common, but graded, pain processing and autonomic dysfunction.
Knee

Existence of a Neuropathic Pain Component in Patients with Osteoarthritis of the Knee

Purpose
Pain from osteoarthritis (OA) is generally classified as nociceptive (inflammatory). Animal models of knee OA have shown that sensory nerve fibers innervating the knee are significantly damaged with destruction of subchondral bone junction, and induce neuropathic pain (NP). Our objective was to examine NP in the knees of OA patients using painDETECT (an NP questionnaire) and to evaluate the relationship between NP, pain intensity, and stage of OA.

Materials and Methods
Ninety-two knee OA patients were evaluated in this study. Pain scores using Visual Analogue Scales (VAS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), painDETECT, duration of symptoms, severity of OA using the Kellgren-Lawrence (KL) system, and amount of joint fluid were evaluated and compared using a Spearman’s correlation coefficient by rank test.

Results
Our study identified at least 5.4% of our knee OA patients as likely to have NP and 15.2% as possibly having NP. The painDETECT score was significantly correlated with the VAS and WOMAC pain severity. Compared with the painDETECT score, there was a tendency for positive correlation with the KL grade, and tendency for negative correlation with the existence and amount of joint fluid, but these correlations were not significant.

Conclusion
PainDETECT scores classified 5.4% of pain from knee OA as NP. NP tended to be seen in patients with less joint fluid and increased KL grade, both of which corresponded to late stages of OA. It is important to consider the existence of NP in the treatment of knee OA pain.
Myofascial pelvic pain is fraught with many unknowns. Is it the organs of the pelvis, is it the muscles of the pelvis, or is the origin of the pelvic pain from an extrapelvic muscle? Is there a single source or multiple? In this state of confusion what is the best way to manage the many symptoms that can be associated with myofascial pelvic pain. This article reviews current studies that attempt to answer some of these questions. More questions seem to develop as each study presents its findings.
HA/Migraine

Detection of possible factors favouring the evolution of migraine without aura into chronic migraine

Manzoni GC et al. – Based on these findings, in migraine without aura (MO) patients the high frequency of migraine attacks, comorbidity with depression, and the tendency to develop arterial hypertension should require particular attention and careful management to prevent evolution into chronic migraine (CM).

Methods

Authors searched in the Headache Centre files for all clinical records that met the following criteria:

- First visit between 1976 and 1998;
- Diagnosis of MO or of common migraine at the first observation, with or without association with other primary headache types;
- <15 days per month of migraine at the first observation;
- And at least one follow-up visit at least 10 years after the first visit.

The patients thus identified were then divided into two groups based on a favourable/steady evolution (Group A: n = 243, 195 women and 48 men) or an unfavourable evolution (Group B: n = 72, 62 women and 10 men) of their migraine over time.

In the two groups, authors compared various clinical parameters that were present at the first observation or emerged at the subsequent follow-up visits.

Results

The parameters that were statistically significantly more frequent in Group B—and can therefore be considered possible negative prognostic factors—were:

- ≥10 days per month of migraine at the first observation;
- Presence of depression at the first visit in males;
- And onset of depression or arterial hypertension after the first observation but before transformation to CM in females.
A pilot randomized controlled trial comparing the efficacy of exercise, spinal manipulation, and neuro emotional technique for the treatment of pregnancy related low back pain.

Peterson CD, Haas M, Gregory T.

Abstract

BACKGROUND:
This pilot randomized controlled trial evaluated the feasibility of conducting a full scale study and compared the efficacy of exercise, spinal manipulation, and a mind-body therapy called Neuro Emotional Technique for the treatment of pregnancy-related low back pain, a common morbidity of pregnancy.

METHODS:
Healthy pregnant women with low back pain of insidious onset were eligible to enroll in the study at any point in their pregnancy. Once enrolled, they remained in the study until they had their babies. Women were randomly allocated into one of three treatment groups using opaque envelopes. The treatment schedule paralleled the prenatal care schedule and women received individualized intervention. Our null hypothesis was that spinal manipulation and Neuro Emotional Technique would perform no better than exercise in enhancing function and decreasing pain. Our primary outcome measure was the Roland Morris Disability Questionnaire and our secondary outcome measure was the Numeric Pain Rating Scale. Intention to treat analysis was conducted. For the primary analysis, regression was conducted to compare groups on the outcome measure scores. In a secondary responder analysis, difference in proportions of participants in attaining 30% and 50% improvement were calculated. Feasibility factors for conducting a future larger trial were also evaluated such as recruitment, compliance to study protocols, cost, and adverse events.

RESULTS:
Fifty-seven participants were randomized into the exercise (n = 22), spinal manipulation (n = 15), and Neuro Emotional Technique (n = 20) treatment arms. At least 50% of participants in each treatment group experienced clinically meaningful improvement in symptoms for the Roland Morris Disability Questionnaire. At least 50% of the exercise and spinal manipulation participants also experienced clinically meaningful improvement for the Numeric Pain Rating Scale. There were no clinically meaningful or statistically significant differences between groups in any analysis.

CONCLUSIONS:
This pilot study demonstrated feasibility for recruitment, compliance, safety, and affordability for conducting a larger study in the future. Spinal manipulation and exercise generally performed slightly better than did Neuro Emotional Technique for improving function and decreasing pain, but the study was not powered to detect the between-group differences as statistically significant. Trial registration ClinicalTrials.gov (Identifier: NCT00937365)
Immediate Changes in Widespread Pressure Pain Sensitivity, Neck Pain, and Cervical Range of Motion After Cervical or Thoracic Thrust Manipulation in Patients With Bilateral Chronic Mechanical Neck Pain: A Randomized Clinical Trial
Raquel Martínez-Segura, Ana I. De-la-Llave-Rincón, Ricardo Ortega-Santiago, Joshua A. Cleland, César Fernández-de-las-Peñas
DOI: 10.2519/jospt.2012.4151

**STUDY DESIGN:** Randomized clinical trial. **OBJECTIVES:** To compare the effects of cervical versus thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain on pressure pain sensitivity, neck pain, and cervical range of motion. **BACKGROUND:** Evidence suggests that spinal interventions can stimulate descending inhibitory pain pathways. To our knowledge, no study has investigated the neurophysiological effects of thoracic thrust manipulation in individuals with bilateral chronic mechanical neck pain, including widespread changes on pressure sensitivity. **METHODS AND MEASURES:** Ninety patients (51% females) were randomly assigned to 1 of 3 groups: cervical thrust manipulation on the right, cervical thrust manipulation on the left, or thoracic thrust manipulation. Pressure pain thresholds (PPTs) over the C5-C6 zygapophyseal joint, lateral epicondyle, and tibialis anterior muscle, neck pain (11-point numeric pain rating scale [NPRS]), and cervical spine range of motion were collected at baseline and 10 minutes after the intervention by an assessor blinded to the treatment allocation of the patients. Mixed-model ANCOVAs were used to examine the effects of the treatment on each outcome variable with group as the between subject variable, time and side as the within subjects variables, and gender as covariate. The primary analysis was the Group * Time interaction. **RESULTS:** No significant interactions were found with the mixed model ANCOVAs for any PPT level (C5-C6: P>0.210; lateral epicondyle: P>0.186; tibialis anterior muscle: P>0.268), neck pain intensity (P=0.923), or cervical range of motion (flexion: P=0.700; extension: P=0.387; lateral-flexion: P>0.672; rotation: P>0.192) as dependent variables: all groups exhibiting similar changes in PPT, neck pain and, cervical range of motion (all, P<0.001). Gender did not influence the main effects or the interaction effects in the analyses that were performed for the outcomes (P>0.10). **CONCLUSIONS:** The results of the current randomized clinical trial suggest that cervical and thoracic thrust manipulation induce similar changes in PPT, neck pain intensity, and cervical range of motion in individuals with bilateral chronic mechanical neck pain. However, changes in PPT and cervical range of motion were small and did not surpass their respective minimal detectable change values. Further, because we did not include a control group, we cannot rule out the placebo effect of either thrust intervention on the outcomes. **LEVEL OF EVIDENCE:** Therapy, Level 1b.


**KEY WORDS:** manual therapy, mobilization, spine
Knee


Theresa H. Nakagawa, Érika T. U. Moriya, Carlos D. Maciel, Fábio V. Serrão

DOI: 10.2519/jospt.2012.3987

STUDY DESIGN: Controlled laboratory study using a cross-sectional design. OBJECTIVES: To determine whether there are any differences between the sexes in trunk, pelvis, hip, and knee kinematics, hip strength, and gluteal muscle activation during the performance of a single-leg squat in individuals with patellofemoral pain syndrome (PFPS) and control participants.

BACKGROUND: Though there is a greater incidence of PFPS in females, PFPS is also quite common in males. Trunk kinematics may affect hip and knee function; however, there is a lack of studies of the influence of the trunk in individuals with PFPS. METHODS: Eighty subjects were distributed into 4 groups: females with PFPS, female controls, males with PFPS, and male controls. Trunk, pelvis, hip, and knee kinematics and gluteal muscle activation were evaluated during a single-leg squat. Hip abduction and external rotation eccentric strength was measured on an isokinetic dynamometer. Group differences were assessed using a 2-way multivariate analysis of variance (sex by PFPS status). RESULTS: Compared to controls, subjects with PFPS had greater ipsilateral trunk lean (mean ± SD, 9.3° ± 5.3° versus 6.7° ± 3.0°; \( P = .012 \)), contralateral pelvic drop (10.3° ± 4.7° versus 7.4° ± 3.8°; \( P = .003 \)), hip adduction (14.8° ± 7.8° versus 10.8° ± 5.6°; \( P < .0001 \)), and knee abduction (9.2° ± 5.0° versus 5.8° ± 3.4°; \( P < .0001 \)) when performing a single-leg squat. Subjects with PFPS also had 18% less hip abduction and 17% less hip external rotation strength. Compared to female controls, females with PFPS had more hip internal rotation (\( P < .05 \)) and less muscle activation of the gluteus medius (\( P = .017 \)) during the single-leg squat. CONCLUSION: Despite many similarities in findings for males and females with PFPS, there may be specific sex differences that warrant consideration in future studies and when clinically evaluating and treating females with PFPS.


doi:10.2519/jospt.2012.3987

KEY WORDS: anterior knee pain, biomechanics, electromyography, patella

The authors aim to determine whether there are any differences between the sexes in trunk, pelvis, hip, and knee kinematics, hip strength, and gluteal muscle activation during the performance of a single-leg squat in individuals with patellofemoral pain syndrome (PFPS) and control participants.
Seeing It Helps: Movement-related Back Pain is Reduced by Visualization of the Back During Movement.

Wand BM, Tulloch VM, George PJ, Smith AJ, Goucke R, O'Connell NE, Moseley GL.

Source

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Abstract

OBJECTIVES:
The aim of this study was to determine whether visualization of the back influenced parameters of movement-related pain in people with chronic nonspecific low back pain.

METHODS:
We used a randomized cross-over experiment in which 25 participants performed repeated lumbar spine movements under 2 conditions. In the visual feedback condition, patients were able to visualize their back as it moved by the use of mirrors. In the control condition, the mirror was covered so no visualization of the back was possible.

RESULTS:
The average postmovement pain intensity after participants had moved with visual feedback was less (35.5±22.8 mm) than when they moved without visual feedback (44.7±26.0 mm). This difference was statistically significant (mean difference=9.3, 95% confidence interval: 2.8-15.7 F(1,22)=8.82, P=0.007). The average time to ease after participants had moved with visual feedback was shorter (44.5 ±53.8) than when they moved without visual feedback (94.4 ±80.7). This difference was also statistically significantly (mean difference=49.9, 95% confidence interval: 19.3-80.6, F(1,22)=8.82, P=0.003).

DISCUSSION:
Patients with chronic nonspecific low back pain reported less increase in pain and faster resolution of pain when moving in an environment that enabled them to visualize their back. This is consistent with emerging research on the use of mirror visual feedback in other long-standing pain problems and suggests that similar lines of inquiry may be worth pursuing in the chronic nonspecific low back pain population.

PMID: 22699134 [PubMed - as supplied by publishe
A Randomized-controlled Trial of Using a Book of Metaphors to Reconceptualize Pain and Decrease Catastrophizing in People With Chronic Pain.

Gallagher L, McAuley J, Moseley GL.

Source

*Sansom Institute for Health Research, University of South Australia, Adelaide, SA, Australia
†Neuroscience Research Australia and The University of New South Wales, Sydney, NSW, Australia.

Abstract

OBJECTIVES:
Reconceptualization of pain and reduction of pain-related catastrophizing are primary objectives in chronic pain rehabilitation. Teaching people about the underlying biology of pain has been shown to facilitate these objectives. The objective of this study was to investigate whether written metaphor and story can be used to increase knowledge of the biology of pain and reduce pain-related catastrophizing.

METHODS:
In this randomized single-blind partial cross-over controlled trial, 79 people with chronic pain received either a booklet of metaphors and stories conveying key pain biology concepts or a booklet containing advice on how to manage chronic pain according to established cognitive-behavioral principles. The primary outcome variables, pain biology knowledge and catastrophizing, were measured before randomization, at 3 weeks and at 3 months, at which time the control group was crossed over to receive the metaphors and stories booklet. Pain and disability were secondary outcome variables.

RESULTS:
The Metaphors group showed larger changes in both variables (time×group interactions: P<0.01, effect size Cohen d=0.7 for catastrophizing and 1.7 for pain biology knowledge). Gains were maintained for at least 3 months. Changes were replicated in the Advice group when crossed over. There was no change in pain or self-reported disability in either group.

DISCUSSION:
We conclude that providing educational material through metaphor and story can assist patients to reconceptualize pain and reduce catastrophizing. Metaphor and story could be used as a precursuer to other interventions that target functional capacity.

PMID: 22688603 [PubMed - as supplied by publisher]
LBP/Pregnacy

Osteopathic manipulative treatment in pregnant women.

Lavelle JM.

Source
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Abstract
Pregnant women experience extensive physiologic and structural changes during pregnancy that affect their daily functioning. The addition of osteopathic manipulative treatment (OMT) to the standard care of pregnant women has been hypothesized to enhance homeostasis and improve quality of life as the body adapts to these changes. Specifically, it has been postulated that OMT can ease pain in pregnant women by eliminating somatic dysfunction and maintaining proper structure. Also, through the viscerosomatic connection, the hemodynamic changes of the maternal body can be controlled, the duration of labor reduced, and the complications of labor avoided. The author reviews the available literature on the use and effectiveness of OMT during pregnancy.

PMID: 22707643 [PubMed - in process]
Gender differences in both active and passive parts of the plantar flexors series elastic component stiffness and geometrical parameters of the muscle-tendon complex.

Fouré A, Cornu C, McNair PJ, Nordez A.

Source
Laboratoire Motricité, Interactions, Performance-EA 4334, UFR STAPS, Université de Nantes, 25 bis Bd Guy Mollet, 44 322 Nantes cedex 3, France.

Abstract
Men are reportedly at higher risk of plantar flexor muscle injury and Achilles tendon ruptures than women. Biomechanical parameters are thought to play a role in the higher frequency of injury to males. One parameter is the stiffness of tissues; a stiff tissue cannot absorb sufficient energy with loading, and subsequently may be more likely to be injured. Thus, our purpose was to investigate the gender difference in the geometrical parameters of plantar flexor's muscle-tendon complex and the stiffness of both active and passive parts of the series elastic component (S(SEC1) and S(SEC2), respectively). Using the alpha method on data obtained from quick stretches to the plantar flexors performed during isometric contractions, S(SEC1) and S(SEC2) were assessed. Plantar flexor muscles and Achilles tendon cross-sectional areas (CSA(TS) and CSA(AT), respectively) were determined in young healthy men (n = 49) and women (n = 31). The findings showed that S(SEC2) was higher in men (p < 0.001), but this difference was not apparent when S(SEC2) was normalized to CSA(AT) (p > 0.05). In contrast, S(SEC1) was lower in men (p < 0.001) and remained so after normalization to CSA(TS). Higher joint stiffness observed in men was notably influenced by lever arm length. Thus, the results of this study have implications for performance and injury.
Acute Effect of Passive Static Stretching on Lower-body Strength in Moderately Trained Males.

Gergley JC.

Source
Associate Professor: Department of Kinesiology & Health Science, Box 13015 - SFA Station, Nacogdoches, Texas 75962-3015, Office: (936) 468-1614, Fax: (936) 468-1850. Email: jgergley@sfasu.edu.

Abstract
ABSTRACT: The purpose of this investigation was conducted to determine the acute effect of passive static stretching of the lower-body musculature on lower-body strength in a one repetition maximum (1RM) squat exercise in young (18-24 yrs.) moderately trained men (N = 17). Two supervised warm-up treatments were applied before each performance testing session using a counterbalanced design on nonconsecutive days. The first treatment consisted of an active dynamic warm-up (AD) with resistance machines (i.e. leg extension / leg flexion) and free weights (i.e. barbell squat) while the second treatment added passive static stretching (PSS) of the lower-body plus the AD treatment. 1RM was determined using the maximum barbell squat following a progressive loading protocol. Subjects were also asked to subjectively evaluate their lower-body stability during 1RM testing sessions for both the AD and PSS treatments. A significant decrease in 1RM (8.36 %) and lower-body stability (22.68 %) was observed following the PSS treatment. Plausible explanations for this observation may be related to a more compliant muscle tendon unit (MTU) and / or altered or impaired neurological function in the active musculature. It is also possible that strength was impaired by the PSS due to joint instability. The findings of this study suggest that intensive stretching such as lower-body PSS should be avoided prior to training the lower-body or performing the 1RM in the squat exercise in favor of an AD dynamic warm-up using resistance training equipment in the lower-body musculature.

PMID: 22692125 [PubMed - as supplied by publisher]
Surgical treatment of complex regional pain syndrome type II with regional subcutaneous venous sympathectomy.

Happak W, Sator-Katzenschlager S, Kriechbaumer LK.

Source

From the Division of Plastic and Reconstructive Surgery, Department of Surgery (W.H.), Department of Special Anaesthesia and Pain Therapy (S.S.-K.), General Intensive Care and Pain Management, and University Clinic of Trauma Surgery (L.K.K.), Medical University of Vienna, Vienna, Austria.

Abstract

BACKGROUND:
The effectiveness of a new surgical technique for the treatment of severe chronic pain stages was evaluated. For the last 140 years, the treatment of complex regional pain syndrome type II (CRPS II) has been an unsolved problem. Therapeutic approaches have included conventional pain medication, physical therapy, sympathetic blocks, transcutaneous or spinal cord stimulation, injections or infusion therapies, and sympathectomy. When used alone or in combination, these therapies often yield unfavorable results. The majority of physicians who treat patients with CRPS are convinced that a surgical treatment of the affected extremity only exacerbates the symptoms, especially its hallmark excruciating pain.

METHODS:
Sixteen patients with a CRPS type II of the upper or lower limb were included in the study after ineffective pain therapy for more than 6 months. The most proximal region of pain associated with CRPS was localized, and 2% lidocaine was injected into that area. Once the sympathetic, deep, burning pain had been blocked, the subcutaneous veins in the previously determined area were surgically removed. A visual analog scale, the Nottingham Health Profile, and physical examinations were used to evaluate the outcome of the operation.

RESULTS:
Twelve (75%) surgically treated patients showed significant improvement in limb function, the visual analog scale, and the Nottingham Health Profile.

CONCLUSIONS:
These data and recent findings in animal models conclude that CRPS type II is maintained by a coupling of newly sprouted sympathetic and sensible fibers. These fibers can be resected with a regional subcutaneous venous sympathectomy.

LEVEL OF EVIDENCE:
Therapeutic study, level III.

PMID: 22695435 [PubMed - in process]
Clinical Pilates versus General Exercise for Chronic Low Back Pain: Randomized Trial

Wajsweiler H et al. – An individualized clinical Pilates program produced similar beneficial effects on self–reported disability, pain, function and health–related quality of life as a general exercise program in community volunteers with chronic low back pain.

**Methods**

Eighty–seven community volunteers with low back pain for ≥3 months and age 18–70 were randomized to either the Pilates (n = 44) or general exercise (n = 43) group.

The primary outcome was pain/disability measured with the Quebec scale.


All participants attended 60–min exercise sessions twice weekly for 6 wk supervised by a physiotherapist and performed daily home exercises that were continued during the follow–up.

Participants from the clinical Pilates group received an individualized direction–specific exercise program prescribed by the physiotherapist after a clinical examination.

The general exercise group received a generic set of exercises that were multidirectional and nonspecific.

Outcomes were assessed after 6 wk (primary time point) and at 12 and 24 wk.

Differences in mean change were compared between groups using ANCOVA adjusted for baseline values of the outcome.

**Results**

Eighty–three participants (96%) completed the 6–wk intervention and 60 (69%) completed the 24–wk follow–up.

At 6 wk, no difference was found between groups for change in the Quebec scale (3.5, 95% confidence interval = −7.3 to 0.3, P = 0.07); both groups showed significant improvements.

Similar results were found at the 12– and 24–wk follow–up and for the secondary outcome measures.
Grover M – Treatment options are limited at best with most therapeutic regimens extrapolated from pain management of other functional gastrointestinal (GI) disorders and chronic pain conditions. A comprehensive approach to management using a biopsychosocial construct and collaboration with pain specialists and psychiatry is most beneficial to the management of this disorder.
Pelvic Floor

**Relationship between vulvodynia and chronic comorbid pain conditions**  Obstetrics and Gynecology, 06/25/2012

Reed BD et al. – Chronic pain conditions are common, and a subgroup of women with vulvodynia is more likely than those without vulvodynia to have one or more of the three other chronic pain conditions evaluated.

**OBJECTIVE:** To estimate the relationship among the presence of vulvodynia, fibromyalgia, interstitial cystitis, and irritable bowel syndrome.

**METHODS:** Validated questionnaire-based screening tests for the four pain conditions were completed by women with and without vulvodynia who were participating in the Michigan Woman to Woman Health Study, a longitudinal population-based survey in southeastern Michigan. Weighted population-based estimates of the prevalence and characteristics of participants with these chronic comorbid pain conditions were calculated using regression analyses.

**RESULTS:** Of 1,940 women who completed the survey containing all four screening tests, 1,890 (97.4%) answered all screening questions and were included. The prevalences of the screening-based diagnoses ranged from 7.5% (95% confidence interval [CI] 6.2–9.0) for interstitial cystitis, 8.7% (95% CI 7.3–10.4) for vulvodynia, 9.4% (95% CI 8.1–11.0) for irritable bowel syndrome, to 11.8% (95% CI 10.1–13.7) for fibromyalgia with 27.1% screening positive for multiple conditions. The presence of vulvodynia was associated with the presence of each of the other comorbid pain conditions ($P<.001$, odds ratio 2.3–3.3). Demographic risk factors for each condition varied. Increasing age was not associated with greater numbers of comorbid conditions, and only low socioeconomic status was associated with having multiple comorbid conditions concurrently.

**CONCLUSION:** Chronic pain conditions are common, and a subgroup of women with vulvodynia is more likely than those without vulvodynia to have one or more of the three other chronic pain conditions evaluated.

**LEVEL OF EVIDENCE:** II
Identifying selective visual attention biases related to fear of pain by tracking eye movements within a dot-probe paradigm.

Yang Z, Jackson T, Gao X, Chen H.

School of Psychology, Southwest University, Chongqing, China.

Abstract

This research examined selective biases in visual attention related to fear of pain by tracking eye movements (EM) toward pain-related stimuli among the pain-fearful. EM of 21 young adults scoring high on a fear of pain measure (H-FOP) and 20 lower-scoring (L-FOP) control participants were measured during a dot-probe task that featured sensory pain-neutral, health catastrophe-neutral and neutral-neutral word pairs. Analyses indicated that the H-FOP group was more likely to direct immediate visual attention toward sensory pain and health catastrophe words than was the L-FOP group. The H-FOP group also had comparatively shorter first fixation latencies toward sensory pain and health catastrophe words. Conversely, groups did not differ on EM indices of attentional maintenance (i.e., first fixation duration, gaze duration, and average fixation duration) or reaction times to dot probes. Finally, both groups showed a cycle of disengagement followed by re-engagement toward sensory pain words relative to other word types. In sum, this research is the first to reveal biases toward pain stimuli during very early stages of visual information processing among the highly pain-fearful and highlights the utility of EM tracking as a means to evaluate visual attention as a dynamic process in the context of FOP.

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PMID: 22717101 [PubMed - as supplied by publisher]
Fear-avoidance model of chronic pain: the next generation.

Crombez G, Eccleston C, Van Damme S, Vlaeyen JW, Karoly P.

Abstract

OBJECTIVE:
The fear-avoidance (FA) model of chronic pain describes how individuals experiencing acute pain may become trapped into a vicious circle of chronic disability and suffering. We propose to extend the FA model by adopting a motivational perspective on chronic pain and disability.

METHODS:
A narrative review.

RESULTS:
There is ample evidence to support the validity of the FA model as originally formulated. There are, however, some key challenges that call for a next generation of the FA model. First, the FA model has its roots in psychopathology, and investigators will have to find a way to account for findings that do not easily fit within such framework. Second, the FA model needs to address the dynamics and complexities of disability and functional recovery. Third, the FA model should incorporate the idea that pain-related fear and avoidance occurs in a context of multiple and often competing personal goals.

DISCUSSION:
To address these 3 key challenges, we argue that the next generation of the FA model needs to more explicitly adopt a motivational perspective, one that is built around the organizing powers of goals and self-regulatory processes. Using this framework, the FA model is recast as capturing the persistent but futile attempts to solve pain-related problems to protect and restore life goals.

PMID: 22673479 [PubMed - in process]
Perceived injustice: a risk factor for problematic pain outcomes.

Sullivan MJ, Scott W, Trost Z.

Source
Department of Psychology, McGill University, Montreal, QC, Canada.

Abstract

BACKGROUND:
Emerging research suggests that perceptions of injustice after musculoskeletal injury can have a significant impact on a number of pain-related outcomes.

AIMS:
The purpose of this paper is to review evidence linking perceptions of injustice to adverse pain outcomes. For the purposes of this paper, perceived injustice is defined as an appraisal cognition comprising elements of the severity of loss consequent to injury ("Most people don't understand how severe my condition is"), blame ("I am suffering because of someone else's negligence"), a sense of unfairness ("It all seems so unfair"), and irreparability of loss ("My life will never be the same").

RESULTS:
Cross-sectional studies show that high scores on perceptions of injustice are correlated with pain catastrophizing, fear of movement, and depression. Prospective studies show that high scores on perceived injustice are a prognostic indicator of poor rehabilitation outcomes and prolonged work disability. Research shows that perceptions of injustice interfere not only with physical recovery after injury, but perceptions of injustice also impact negatively on recovery of the mental health problems that might arise subsequent to traumatic injury. Although research has yet to address the process by which perceptions of injustice impact on pain-related outcomes systematically; possible mechanisms include attentional disengagement difficulties, emotional distress, maladaptive coping, heightened displays of pain behavior, anger, and revenge motives.

CONCLUSIONS:
Perceived injustice appears to be associated with problematic health and mental health recovery trajectories after the onset of a pain condition. Future directions for research and treatment are addressed.
Cluster Headaches

Cluster headache and neuropsychological functioning □Cephalalgia, 06/20/2012
Dresler T et al. – These findings are in line with a recently proposed involvement of prefrontal structures in cluster headache (CH) pathophysiology as patients performed worse on neuropsychological tasks relying on these structures. Impaired EF could also result from medication and sleep disturbances due to active CH. Because the decreased performance was also present outside the attacks it may hint at generally altered brain functions, but do not necessarily reflect clinically relevant behaviour.

Methods
Three neuropsychological tests (Trail Making Test (TMT), Go/Nogo Task and Stroop Task) were completed by four headache patient samples (chronic CH, episodic CH in the active or inactive period, and migraine patients) and compared to healthy controls.

Results
Analyses revealed that patients especially with chronic and active episodic CH were particularly impaired in tests relying more on intact EF (i.e. TMT–B, Stroop interference) than on basal cognitive processes (i.e. TMT–A, Stroop naming).

Within the CH groups performance decreased linearly with increasing severity.
Headaches

Migraine and vascular diseases: A review of the evidence and potential implications for management  
*Cephalalgia*, 06/20/2012

Sacco S et al. – Forthcoming guidelines should appropriately recommend supporting migraineurs not only with measures aimed at decreasing headache frequency, thus improving quality of life, but also with general measures and preventive strategies aimed to reduce the overall vascular risk. In fact, headache specialists should take care not only of relieving pain but also of assessing and treating concurrent vascular risk factors, while gynecologists, in particular, should routinely consider the presence and type of migraine before prescribing oral contraceptives.

Available data indicate an increased risk of ischemic stroke in subjects suffering from migraine with aura.

In addition, evidence suggests an association between migraine with aura and cardiac disease, intracerebral hemorrhage, retinal vasculopathy and mortality that needs to be further corroborated; consequently, for those conditions, migraine with aura can be only considered among the less-well-documented risk factors.

As the absolute risk of ischemic stroke in the overall migraineur population is low, subjects suffering from migraine with aura should be made aware of the possible link but not unduly alarmed.

It is a common notion that the vascular risk of migraineurs may be further increased by the presence of easily treatable vascular risk factors such as arterial hypertension, cigarette smoking and oral contraceptive use.
The Role of Gender in the Interaction Between Self-Pain and the Perception of Pain in Others.

Coll MP, Budell L, Rainville P, Decety J, Jackson PL.

Source
École de psychologie, Faculté des Sciences Sociales, Université Laval, Québec, QC, Canada; Centre Interdisciplinaire de Recherche en Réadaptation et Intégration Sociale, Québec, QC, Canada.

Abstract
While self-pain motivates protective behaviors and self-oriented feelings, the perception of others' pain often motivates concern and prosocial behaviors toward the person suffering. The conflicting consequences of these 2 states raise the question of how pain is perceived in others when one is actually in pain. Two conflicting hypotheses could predict the interaction between these 2 signals: the threat value of pain hypothesis and the shared-representation model of pain empathy. Here, we asked 33 healthy volunteers exposed to acute experimental pain to judge the intensity of the pain felt by models expressing different levels of pain in video clips. Results showed that compared to a control warm stimulus, a stimulus causing self-pain increased the perception of others' pain for clips depicting male pain expressions but decreased the perceived intensity of female high pain expressions in both male and female participants. These results show that one's own pain state influences the perception of pain in others and that the gender of the person observed influences this interaction. PERSPECTIVE: By documenting the effects of self-pain on pain perception in others, this study provides a better understanding of the shared mechanisms between self-pain and others' pain processing. It could ultimately provide clues as to how the health status of health care professionals could affect their ability to assess their patients' pain.

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PMID: 22705065 [PubMed - as supplied by publisher]
Physical and Psychosocial Predictors of Functional Trunk Capacity in Older Adults With and Without Low Back Pain. Journal of Manipulative and Physiological Therapeutics, 06/27/2012 Clinical Article
Ledoux E et al. – Patients showed diminished functional capacity compared with healthy participants. Moreover, physical activity levels represent the most important predictors of functional capacity in elderly patients with low back pain.

Methods
The study was done in Canada and included 61 community–dwelling elderly individuals (29 patients with nonspecific chronic LBP and 32 healthy participants) who performed maximal trunk endurance and force tasks.

Participants completed various psychologic and functional questionnaires.

Sequential linear regression analyses were performed with functional capacity results (endurance and force) as dependent variables and questionnaire scores as independent variables.

Results
Endurance time and peak force were significantly lower in patients compared with healthy elderly individuals (all P values < .001), whereas pain–related fear of movement, pain catastrophizing, and depression levels were higher in patients than their healthy counterpart (all P values < .001).

After adjusting for physical activity and disability levels (R² = 33.7%–50.5% in patients; R² = 0.1%–5.7% in healthy individuals), none of the psychologic questionnaire could explain variations observed in functional capacity in patients (R² changes, 4.8%–6.7%) and in healthy participants (R² changes, 5.2%–10.6%).
Pain/Total hips and knees

A Cross-Sectional Survey on Prevalence and Risk Factors for Persistent Postsurgical Pain 1 Year After Total Hip and Knee Replacement ©Regional Anesthesia and Pain Medicine, 06/26/2012
Liu SS et al. – Persistent postsurgical pain is common after total hip (THR) and knee (TKR) replacements and is associated with reduced health–related quality of life, although the survey may be biased by the low response rate and retrospective recall bias. Nonmodifiable risk factors may lead to risk stratification. Severity of acute postoperative pain may be a modifiable risk factor.

Methods
From October 10, 2007, to March 15, 2010, patients who had undergone primary THR or TKR with a minimum follow–up of 1 year were identified.

A previously published questionnaire to identify persistent postsurgical pain that included a 36–item Short Form Health Survey was mailed to this group.

Independent risk factors for persistent pain were identified with logistic regression.

Results
Responses from 1030 patients who underwent surgery at some point in time between June 13, 2006, and June 24, 2009, were analyzed (32% response rate).

Forty–six percent of patients reported persistent pain (38% after THR and 53% after TKR) with a median average pain score of 3 of 10 and worst pain score of 5.

Independent risk factors for persistent pain were female sex (odds ratio [OR], 1.23), younger age (OR, 0.97), prior surgery on hip or knee (OR, 1.39), knee versus hip replacement (OR, 1.65), lower–quality postsurgical pain control (OR, 0.9), and presence of pain in other areas of the body (OR, 2.09).

All scores in the 36–item Short Form Health Survey were worse (8%–28% decrease) in patients with persistent postsurgical pain (P<0.001).
Self-Reported Data on Sleep Quality and Psychologic Characteristics in Patients with Myofascial Pain and Disc Displacement Versus Asymptomatic Controls

Sevgi Sener, PhD/Özkan Guler, PhD

Pages: 348-352
PMID: 22720284

Purpose: The aim of this research was to compare the differences between patients with myofascial pain and disc displacement and asymptomatic individuals based on aspects of psychologic status and sleep quality. Materials and Methods: One hundred thirty patients (81 women, 49 men; mean ages: 30.0 and 31.0 years, respectively) with temporomandibular disorder were selected, and 64 control subjects (32 women, 32 men; mean ages: 27.2 and 27.5 years, respectively) were included in the investigation over a period of 1 year. Clinical diagnosis of 65 patients with myofascial pain and 65 patients with disc displacement with or without limitation and joint pain was determined according to the Research Diagnostic Criteria for Temporomandibular Disorders. The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate sleep quality. Psychologic status was assessed using Symptom Checklist-90-Revised (SCL-90-R). Chi-square, Kolmogorov-Smirnov, one-way analysis of variance, and Tukey Honestly Significant Difference post hoc multiple comparison or Tamhane T2 tests were used for statistical analysis. Results: There was a significant difference between patients with myofascial pain and disc displacement regarding somatization and paranoid ideation. No statistically significant difference was found between patients with myofascial pain and controls in all dimensions of the SCL-90-R. Total score for the PSQI was statistically significantly different between patients with myofascial pain and controls; no significant differences were found between patients with disc displacement and those with myofascial pain or controls regarding the PSQI. Conclusion: To manage patients with myofascial pain, psychologic assessments including sleep quality should be considered. Int J Prosthodont 2012;25:348–352.
Altered trapezius muscle behavior in individuals with neck pain and clinical signs of scapular dysfunction.

Zakharova-Luneva E, Jull G, Johnston V, O'Leary S.

Source

Physiotherapist, Division of Physiotherapy, The University of Queensland, St Lucia, Queensland, Australia.

Abstract

OBJECTIVE:
The purpose of this study was to compare the behavior of the trapezius muscle in patients with chronic mechanical neck pain (MNP) and clinical signs of scapula dysfunction to healthy controls.

METHODS:
This is a cross-sectional, between-participant study of trapezius muscle behavior. Eighteen volunteers with chronic MNP and 20 healthy controls participated in the study. Participants performed isometric shoulder abduction, external rotation, and flexion at 3 intensities of effort (maximum voluntary contraction [MVC], 50% MVC, and 20% MVC). Electromyographic signals were recorded unilaterally from the upper, middle, and lower portions of the trapezius muscle during isometric shoulder contractions.

RESULTS:
Significantly greater levels of lower trapezius electromyographic signals were observed in patients with MNP compared with controls for the abduction (P < .027) and external rotation (P < .036) conditions but not for the flexion condition (P > .392). No differences in activity were observed in the upper (P > .248) or middle (P > .052) portions of trapezius between groups during any of the isometric shoulder girdle conditions.

CONCLUSIONS:
These findings represent a change in the behavior of the lower trapezius muscle in individuals with MNP who exhibit clinical signs of scapular dysfunction. Clinicians should consider the potential involvement of the axioskapular muscles when assessing patients with chronic neck pain, as retraining scapular function may be required for the successful management of these patients.

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Pain/breast cancer

Pain, movement, and mind: does physical activity mediate the relationship between pain and mental health among survivors of breast cancer?  The Clinical Journal of Pain, 06/19/2012
Sabiston CM et al. – Participation in physical activity is one pathway through which pain influences mental health. Efforts are needed to help survivors of breast cancer manage pain symptoms and increase their level of physical activity to help improve mental health.

Methods
Survivors of breast cancer (N=145) completed self-report measures of pain symptoms at baseline, wore an accelerometer for 7 days, and reported levels of depression symptoms and negative and positive affect 3 months later.

Hierarchical linear regression analyses, controlling for personal and cancer–related demographics, were used to test the association between pain symptoms and each mental health outcome, as well as the mediation effect of physical activity.

Results
Pain positively predicted depression symptoms [F(6,139)=4.31, P<0.01, R²=0.15] and negative affect [F(5,140)=4.17, P<0.01, R²=0.13], and negatively predicted positive affect [F(6,139)=2.12, P=0.03, R²=0.08].

Physical activity was a significant (P<0.01) partial mediator of the relationship between pain and depression and between pain and positive affect.
Pain

Evaluating physical functioning as part of a Cognitive Behavioural Therapy approach in treatment of people suffering from chronic pain. Dysvik E et al. – Findings suggest that pain management intervention, that includes physical activity designed to help patients to live a healthier life, can have a clinically assessable impact on reducing pain interference (PI) and severity (PS), improving physical functioning and HRQL.

Methods

A consecutive sample of 117 outpatients from a rehabilitation unit at a university hospital was included in this intervention study.

The effects of an 8-week multidisciplinary programme, including 6 and 12 month follow-up, was examined with measures including health-related quality of life (HRQL), pain perception, pain stages of change and physical functioning.

To broaden understanding qualitative data from three physiotherapists involved were collected.

Results

Improvements in physical functioning status during the programme were positively related to improvements in stages of change, pain interference (PI) and severity (PS) and HRQL. Qualitative data support these findings.
Acute Severe Pain Is a Common Consequence of Sexual Assault.


Source
TRYUMPH Research Program, University of North Carolina, Chapel Hill, North Carolina; Department of Anesthesiology, University of North Carolina, Chapel Hill, North Carolina.; Department of Emergency Medicine, University of North Carolina, Chapel Hill, North Carolina.

Abstract
Sexual assault (SA) is common, but the epidemiology of acute pain after SA has not previously been reported. We evaluated the severity and distribution of pain symptoms in the early aftermath of SA among women receiving Sexual Assault Nurse Examiner (SANE) care, and the treatment of pain by SANE nurses. Severe pain (≥7 on a 0-10 numeric rating scale) was reported by 53/83 women sexual assault survivors (64% [95% CI, 53-74%]) at the time of SANE evaluation and 43/83 women (52% [95% CI, 41-63%]) 1 week later. Pain in 4 or more body regions was reported by 44/83 women (53% [95% CI, 42-64%]) at the time of initial evaluation and 49/83 women (59% [95% CI, 48-70%]) at 1 week follow-up. Among survivors with severe pain at the time of initial postassault evaluation, only 7/53 (13% [95% CI, 6-26%]) received any pain medication at the time of initial SANE treatment. These findings suggest that pain is common in SA survivors in the early postassault period, but rarely treated. PERSPECTIVE: Acute pain is common after sexual assault. Practice guidelines for SANE nurses and others who provide care to sexual assault survivors in the early aftermath of assault should include specific recommendations for pain evaluation and treatment. Prospective longitudinal studies of pain outcomes among sexual assault survivors are needed.

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Is spinal manipulation effective for pain? An overview of systematic reviews.

Posadzki P.

Abstract

Objective. This article is aimed at critically evaluating the evidence from systematic reviews (SRs) of spinal manipulation in patients with pain. Design. The study was designed as a SR of SRs. Methods. Four electronic databases were searched to identify all relevant articles of the effectiveness of spinal manipulation for pain. SRs were defined as articles employing a repeatable methods section. Results. Twenty-two SRs relating to the following pain conditions: low back pain (N = 6), headache (N = 5), neck pain (N = 4), any medical problem (N = 1), carpal tunnel syndrome (N = 1), dysmenorrhea (N = 1), fibromyalgia (N = 1), lateral epicondylitis (N = 1), musculoskeletal conditions (N = 1) and nonspinal pain (N = 1), were included. Positive or, for multiple SR, unanimously positive conclusions were drawn for none of the conditions mentioned earlier. Limitation. Publication bias as a well-known phenomenon may have been inherited in this article. Conclusion. Collectively, these data fail to demonstrate that spinal manipulation is an effective intervention for pain management.

Wiley Periodicals, Inc.

PMID: 22621391 [PubMed - in process]
Manipulation/ HA

Spinal manipulations for tension-type headaches: a systematic review of randomized controlled trials.
Posadzki P, Ernst E.
Source
Complementary Medicine, Peninsual Medical School, Universities of Exeter & Plymouth, Veysey Building, Salmon Pool Lane, Exeter EX2 4SG, United Kingdom.
Paul.Posadzki@pcmd.ac.uk
Abstract
AIMS:
The objective of this systematic review was to assess the effectiveness of spinal manipulations as treatment option for tension type headaches.
METHODS:
Eight databases were searched from their inception to May 2011. All randomized trials were considered, if they investigated spinal manipulations performed by any type of healthcare professional for treating tension type headaches in human subjects. The selection of studies, data extraction, and validation were performed independently by two reviewers. The Cochrane tool and the Jadad score were used to assess methodological quality of trials.
RESULTS:
Five randomized clinical trials (RCTs) met the inclusion criteria. Their methodological quality was mostly high and ranged between 2 and 4 on the Jadad score. Four RCTs suggested that spinal manipulations are more effective than drug therapy, spinal manipulation plus placebo, sham spinal manipulation plus amitriptyline or sham spinal manipulation plus placebo, usual care or no intervention. One RCT showed no difference in daily hours of headache, pain intensity, and daily analgesic use compared to soft tissue therapy plus placebo laser.
CONCLUSIONS:
The evidence that spinal manipulation alleviates tension type headaches is encouraging, but inconclusive. The low quantity of the available data prevent firm conclusion.

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Manipulation

Biomechanics - Review of approaches for performance training in spinal manipulation.

Triano JJ, Descarreaux M, Dugas C.

Source
Graduate Education and Research Program, Canadian Memorial Chiropractic College, 6100 Leslie Street, Toronto, Ontario, Canada M2H 3J1.

Abstract
Motor skills development is an inherent part of clinical training in health disciplines. The conscious use of educational theory to ground learning is receiving increasing attention across health care education. There are three distinct, yet overlapping, stages of motor skill learning; the cognitive, the integrative or associative, and the autonomous; in which a contextual framework for learning content may be structured. The learning is associated with a mapping of changes within the central nervous system by the interactive mechanisms of adaptation, use-dependent plasticity and operant reinforcement. Successful skill learning requires a sufficient amount of practice and the implementation of relevant feedback strategies in the form of knowledge of performance (KP) or knowledge of results (KR). There is a natural maturation of skills that may be accelerated by feedback. Several factors contribute to stronger skills development. "Mixture-of-experts" models systematically sequence tasks into logical blocks of theory, practice and student reflection on performance. Feedback should involve both KP and KR that compares performance to a tangible standard. Rehearsals should balance use of simulators and volunteer simulated patients to provide the full range of safe and effective learning opportunities prior to students accepting a role as care givers to the public in any clinical setting.

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Central Sensitisation

Smart KM, Blake C, Staines A, Thacker M, Doody C.
As a mechanisms-based classification of pain 'central sensitisation pain' (CSP) refers to pain arising from a dominance of neurophysiological dysfunction within the central nervous system. Symptoms and signs associated with an assumed dominance of CSP in patients attending for physiotherapy have not been extensively studied. The purpose of this study was to identify symptoms and signs associated with a clinical classification of CSP in patients with low back (±leg) pain. Using a cross-sectional, between-subjects design; four hundred and sixty-four patients with low back (±leg) pain were assessed using a standardised assessment protocol. Patients' pain was assigned a mechanisms-based classification based on experienced clinical judgement. Clinicians then completed a clinical criteria checklist specifying the presence or absence of various clinical criteria. A binary logistic regression analysis with Bayesian model averaging identified a cluster of three symptoms and one sign predictive of CSP, including: 'Disproportionate, non-mechanical, unpredictable pattern of pain provocation in response to multiple/non-specific aggravating/easing factors', 'Pain disproportionate to the nature and extent of injury or pathology', 'Strong association with maladaptive psychosocial factors (e.g. negative emotions, poor self-efficacy, maladaptive beliefs and pain behaviours)' and 'Diffuse/non-anatomic areas of pain/tenderness on palpation'. This cluster was found to have high levels of classification accuracy (sensitivity 91.8%, 95% confidence interval (CI): 84.5-96.4; specificity 97.7%, 95% CI: 95.6-99.0). Pattern recognition of this empirically-derived cluster of symptoms and signs may help clinicians identify an assumed dominance of CSP in patients with low back pain disorders in a way that might usefully inform their management.


Smart KM, Blake C, Staines A, Thacker M, Doody C.
As a mechanisms-based classification of pain 'peripheral neuropathic pain' (PNP) refers to pain arising from a primary lesion or dysfunction in the peripheral nervous system. Symptoms and signs associated with an assumed dominance of PNP in patients attending for physiotherapy have not been extensively studied. The purpose of this study was to identify symptoms and signs associated with a clinical classification of PNP in patients with low back (±leg) pain. Using a cross-sectional, between-subjects design; four hundred and sixty-four patients with low back (±leg) pain were assessed using a standardised assessment protocol. Patients' pain was assigned a mechanisms-based classification based on experienced clinical judgement. Clinicians then completed a clinical criteria checklist specifying the presence or absence of various clinical criteria. A binary logistic regression analysis with Bayesian model averaging identified a cluster of two symptoms and one sign predictive of PNP, including: 'Pain referred in a dermatomal or cutaneous distribution', 'History of nerve injury, pathology or mechanical compromise' and
'Pain/symptom provocation with mechanical/movement tests (e.g. Active/Passive, Neurodynamic) that move/load/compress neural tissue'. This cluster was found to have high levels of classification accuracy (sensitivity 86.3%, 95% CI: 78.0-92.3; specificity 96.0%, 95% CI: 93.4-97.8; diagnostic odds ratio 150.9, 95% CI: 69.4-328.1). Pattern recognition of this empirically-derived cluster of symptoms and signs may help clinicians identify an assumed dominance of PNP mechanisms in patients with low back pain disorders in a way that might usefully inform subsequent patient management.


Smart KM, Blake C, Staines A, Thacker M, Doody C.

Source
Physiotherapy Department, St Vincent's University Hospital, Elm Park, Dublin 4, Ireland.

Abstract
As a mechanisms-based classification of pain 'nociceptive pain' (NP) refers to pain attributable to the activation of the peripheral receptive terminals of primary afferent neurones in response to noxious chemical, mechanical or thermal stimuli. The symptoms and signs associated with clinical classifications of NP have not been extensively studied. The purpose of this study was to identify symptoms and signs associated with a clinical classification of NP in patients with low back (±leg) pain. Using a cross-sectional, between-subjects design; four hundred and sixty-four patients with low back (±leg) pain were assessed using a standardised assessment protocol after which their pain was assigned a mechanisms-based classification based on experienced clinical judgement. Clinicians then completed a clinical criteria checklist indicating the presence/absence of various symptoms and signs. A regression analysis identified a cluster of seven clinical criteria predictive of NP, including: 'Pain localised to the area of injury/dysfunction', 'Clear, proportionate mechanical/anatomical nature to aggravating and easing factors', 'Usually intermittent and sharp with movement/mechanical provocation; may be a more constant dull ache or throb at rest', and the absence of 'Pain in association with other dysesthesias', 'Night pain/disturbed sleep', 'Antalgic postures/movement patterns' and 'Pain variously described as burning, shooting, sharp or electric-shock-like'. This cluster was found to have high levels of classification accuracy (sensitivity 90.9%, 95% CI: 86.6-94.1; specificity 91.0%, 95% CI: 86.1-94.6). Pattern recognition of this empirically-derived cluster of symptoms and signs may help clinicians identify an assumed dominance of NP mechanisms in patients with low back pain disorders.

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Guided Imagery

J Pain Symptom Manage. 2012 Jun 5. [Epub ahead of print]

Guided Imagery for Non-Musculoskeletal Pain: A Systematic Review of Randomized Clinical Trials.

Posadzki P, Lewandowski W, Terry R, Ernst E, Stearns A.

Source

Department of Complementary Medicine, University of Exeter, Peninsula Medical School, Exeter, Devon, United Kingdom.

Abstract

CONTEXT:
Our previous review of the literature concluded that there is encouraging evidence that guided imagery alleviates musculoskeletal pain, but the value of guided imagery in the management of non-musculoskeletal pain remains uncertain.

OBJECTIVES:
The objective of this systematic review was to assess the effectiveness of guided imagery as a treatment option for non-musculoskeletal pain.

METHODS:
Six databases were searched from their inception to February 2011. Randomized clinical trials were considered if they investigated guided imagery in human patients with any type of non-musculoskeletal pain in any anatomical location and assessed pain as a primary outcome measure. Trials of motor imagery and hypnosis were excluded. The selection of studies, data extraction, and validation were performed independently by two reviewers.

RESULTS:
Fifteen randomized clinical trials met the inclusion criteria. Their methodological quality was generally poor. Eleven trials found that guided imagery led to a significant reduction of non-musculoskeletal pain. Four studies found no change in non-musculoskeletal pain with guided imagery in comparison with progressive relaxation, standard care, or no treatment.

CONCLUSION:
The evidence that guided imagery alleviates non-musculoskeletal pain is encouraging but remains inconclusive.

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PMID: 22672919 [PubMed - as supplied by publisher]
C spine/Myofascial TP’s

**Referred pain from myofascial trigger points in head, neck, shoulder, and arm muscles reproduces pain symptoms in blue-collar (manual) and white-collar (office) workers**

*The Clinical Journal of Pain, 06/12/2012*

Fernandez–de–las–Penas C et al. – Blue-collar and white-collar workers exhibited a similar number of TrPs in the upper quadrant musculature. The referred pain elicited by active TrPs reproduced the overall pain pattern. The distribution of TrPs was not significantly different between groups. Clinicians should examine for the presence of muscle TrPs in blue-collar and white-collar workers.

**Methods**

Sixteen (62% women) blue-collar and 19 (75% women) white-collar workers were included in this study.

TrPs in the temporalis, masseter, upper trapezius, sternocleidomastoid, splenius capitis, oblique capitis inferior, levator scapulae, scalene, pectoralis major, deltoid, infraspinatus, extensor carpi radialis brevis and longus, extensor digitorum communis, and supinator muscles were examined bilaterally (hyper-sensitive tender spot within a palpable taut band, local twitch response with snapping palpation, and elicited referred pain pattern with palpation) by experienced assessors blinded to the participants’ condition.

TrPs were considered active when the local and referred pain reproduced any symptom and the patient recognized the pain as familiar.

The referred pain areas were drawn on anatomic maps, digitized, and measured.

**Results**

Blue-collar workers had a mean of 6 (SD: 3) active and 10 (SD: 5) latent TrPs, whereas white-collar workers had a mean of 6 (SD: 4) active and 11 (SD: 6) latent TrPs (P>0.548).

No significant differences in the distribution of active and latent TrPs in the analyzed muscles between groups were found.

Active TrPs in the upper trapezius, infraspinatus, levator scapulae, and extensor carpi radialis brevis muscles were the most prevalent in both groups.

Significant differences in referred pain areas between muscles (P<0.001) were found:

- pectoralis major, infraspinatus, upper trapezius, and scalene muscles showed the largest referred pain areas (P<0.01), whereas the temporalis, masseter, and splenius capitis muscles showed the smallest (P<0.05).
The combination of the referred pain from TrPs reproduced the overall clinical pain area in all participants.

Red flags/Headache

*Cephalalgia*, 2012 Jun 8. [Epub ahead of print]
**Fusiform aneurysms of the vertebral artery: A hidden cause of exertional headache?**

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Source

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Abstract

Background: There is only one reported case of recurrent coital headache related to an unruptured saccular aneurysm of the carotid artery. Case reports: We report on two cases of isolated recurrent coital/exertional headaches ipsilateral to unruptured fusiform aneurysms of the vertebral artery diagnosed by CT angiography. While one case is being managed conservatively, a vertebral stent has been set in the other. Conclusions: CT angiography with full visualisation of intracranial and upper cervical arteries could be used as a screening diagnostic procedure in these cases. Together with saccular aneurysms, fusiform aneurysms should be added to the IHS classification as aetiology for exertional recurrent headaches.

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Combined movement examination (CME) is used in clinical management of spinal dysfunction. Whilst reliability of lumbar spine CME has been investigated, reliability of cervical spine CME is unclear. The aim of this study was to assess the inter-rater reliability of a CME protocol in subjects who have previously experienced a neck problem. Subjects were evaluated to identify their "side of discomfort", "dysfunctional active prime movement (PrM)", "prime combination of movements (PrC)" and "stretch pattern". A secondary aim included the evaluation of a movement order effect. Inter-rater reliability of CME was evaluated in subjects (n = 25) with a history of mechanical neck problems. Through questioning and visual observation of the "functional demonstration", raters (n = 3) had to classify subjects in anterior or posterior stretch patterns and determine movement combinations. Descriptive data for "PrC" showed moderate (67%) percentage agreement for anterior pattern and excellent (92%) for posterior pattern. AC1 values (95% Confidence Interval) were calculated for "Side" (AC1 = 0.96, CI: 0.89-1) and "Pattern" (AC1 = 0.96, CI: 0.89-1) demonstrating excellent inter-examiner reliability. "PrM" demonstrated total (100%) agreement. Establishing an order effect was unreliable (anterior pattern: 33%; posterior pattern: 38%). Results showed that a CME based protocol is a reliable assessment tool. Further research using larger samples and other clinical presentations is warranted.

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Inter-therapist agreement in classifying patients with cervical radiculopathy and patients with non-specific neck-arm pain.

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Abstract
Identification of differences in clinical presentation and underlying pain mechanisms may assist the classification of patients with neck-arm pain which is important for the provision of targeted best evidence based management. The aim of this study was to: (i) assess the inter-examiner agreement in using specific systems to classify patients with cervical radiculopathy and patients with non-specific neck-arm pain associated with heightened nerve mechanosensitivity (NSNAP); (ii) assess the agreement between two clinical examiners and two clinical experts in classifying these patients, and (iii) assess the diagnostic accuracy of the two clinical examiners. Forty patients with unilateral neck-arm pain were examined by two clinicians and classified into (i) cervical radiculopathy, (ii) NSNAP, (iii) other. The classifications were compared to those made independently by two experts, based on a review of patients' clinical assessment notes. The experts' opinion was used as the reference criterion to assess the diagnostic accuracy of the clinical examiners in classifying each patient group. There was an 80% agreement between clinical examiners, and between experts and 70%-80% between clinical examiners and experts in classifying patients with cervical radiculopathy (kappa between 0.41 and 0.61). Agreement was 72.5%-80% in classifying patients with NSNAP (kappa between 0.43 and 0.52). Clinical examiners' diagnostic accuracy was high (radiculopathy: sensitivity 79%-84%; specificity 76%-81%; NSNAP: sensitivity 78%-100%; specificity 71%-81%). Compared to expert opinion, clinicians were able to identify patients with cervical radiculopathy and patients with NSNAP in 80% of cases, our data supporting the reliability of these classification systems.

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Cortical representation of pain in primary sensory-motor areas (S1/M1)-a study using intracortical recordings in humans.

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Source

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Abstract

Intracortical evoked potentials to nonnoxious Aβ (electrical) and noxious Aδ (laser) stimuli within the human primary somatosensory (S1) and motor (M1) areas were recorded from 71 electrode sites in 9 epileptic patients. All cortical sites responding to specific noxious inputs also responded to nonnoxious stimuli, while the reverse was not always true. Evoked responses in S1 area 3b were systematic for nonnoxious inputs, but seen in only half of cases after nociceptive stimulation. Nociceptive responses were systematically recorded when electrode tracks reached the crown of the postcentral gyrus, consistent with an origin in somatosensory areas 1-2. Sites in the precentral cortex also exhibited noxious and nonnoxious responses with phase reversals indicating a local origin in area 4 (M1). We conclude that a representation of thermal nociceptive information does exist in human S1, although to a much lesser extent than the nonnociceptive one. Notably, area 3b, which responds massively to nonnoxious Aβ activation was less involved in the processing of noxious heat. S1 and M1 responses to noxious heat occurred at latencies comparable to those observed in the supra-sylvian opercular region of the same patients, suggesting a parallel, rather than hierarchical, processing of noxious inputs in S1, M1 and opercular cortex. This study provides the first direct evidence for a spinothalamic related input to the motor cortex in humans. Hum Brain Mapp, 2012. © 2012 Wiley Periodicals, Inc.

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On the generalised embodiment of pain: how interoceptive sensitivity modulates cutaneous pain perception.

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Source

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Abstract

Individual differences in interoceptive sensitivity are associated with differences in reported intensity of emotional experience, vulnerability to anxiety and mood disorder and capacity for emotional self-regulation. Enhanced sensitivity to autonomic state is often accompanied by increased autonomic reactivity. Here we tested the hypothesis that healthy people classified as more interoceptively sensitive, by their performance of a heartbeat monitoring task, will demonstrate enhanced perception of pain. We further explored whether this effect is associated with a greater physiological reactivity to the pain stimuli. Using an algometer, cutaneous pressure pain was applied to the thenar eminence in 60 healthy participants. Heart rate variability and respiratory activity were recorded concurrently. We observed significant relationships between heightened interoceptive sensitivity and both enhanced sensitivity and decreased tolerance to pain. These effects were accompanied by a more pronounced parasympathetic decrease and a change in sympathovagal balance during pain assessment in the high, compared to the low, interoceptively sensitive group. Our study provides novel evidence that interoceptive sensitivity is associated with the experience and tolerability of pain in conjunction with reactive changes in autonomic balance.