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Editorial Staff

*Editor's note:* Due to space constraints, we are unable to reprint all of the abstracts from the March/April 2007 issue of *JMPT*. To review the complete table of contents for the March/April issue, visit [www.mosby.com/jmpt](http://www.mosby.com/jmpt).

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Chiropractic care of musculoskeletal disorders in a unique population within Canadian community health centers.

*Michael J. Garner, MSc, Peter Aker, MSc, DC, Jeff Balon, DC, MD, Michael Birmingham, PhD, David Moher, PhD, Dirk Keenan, DC, Pran Manga, PhD*

**Objective:** This study was part of a larger demonstration project integrating chiropractic care into publicly funded Canadian community health centers. This pre/post study investigated the effectiveness of chiropractic care in reducing pain and disability as well as improving general health status in a unique population of urban, low-income, and multiethnic patients with musculoskeletal (MSK) complaints.

**Methods:** All patients who presented to one of two community health center-based chiropractic clinics with MSK complaints between August 2004 and December 2005 were recruited to participate in this study. Outcomes were assessed by a general health measure (Short Form-12), a pain scale (VAS), and site-specific disability indexes (Roland-Morris Questionnaire and Neck Disability Index), which were administered before and after a 12-week treatment period.

**Results:** Three hundred twenty-four patients with MSK conditions were recruited into the study, and 259 (80.0%) of them were followed to the study's conclusion. Clinically important and statistically significant positive changes were observed for all outcomes (Short Form-12: physical composite score mean change = 4.9, 95% confidence interval [CI] = 3.8-6.0; VAS: current pain mean change = 2.3, 95% CI = 1.9-2.6; Neck Disability Index: mean change = 6.8, 95% CI = 5.4-8.1; Roland-Morris Questionnaire: mean change = 4.3, 95% CI = 3.6-5.1). No adverse events were reported.

**Conclusions:** Patients of low socioeconomic status face barriers to accessing chiropractic services. This study suggests that chiropractic care reduces pain and disability as well as improves general health status in patients with MSK conditions. Further studies using a more robust methodology are needed to investigate the efficacy and cost-effectiveness of introducing chiropractic care into publicly funded health care facilities.

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Age- and sex-specific reference values of a test of neck muscle endurance.

**Objective:** This study evaluates age- and sex-specific reference values for neck muscle endurance (NME).

**Methods:** In this cross-sectional study, 116 randomly selected, healthy volunteers (ages 25-64 years) stratified according to age and gender participated. Dorsal and ventral NME was measured in seconds until exhaustion in a laying-down position. A weight of 4 kg for men or 2 kg for women was used in the dorsal procedure. The ventral procedure was performed without external load. Background and physical activity data were obtained and used in the analysis of NME performance.

**Results:** Mean values for dorsal and ventral NME were about 7 and 2.5 minutes for men and 8.5 and 0.5 minutes for women, respectively. The cutoff values for subnormal dorsal and ventral NME were 157 and 56 seconds for men and 173 and 23 seconds for women, respectively. Women's NME was 122% of men's NME in the dorsal ( $P = .17$ ) and 24% of men's NME in the ventral ( $P < .0001$ ) procedure. There were no significant differences among age groups. In multiple regression analysis, physical activity explained 4% of variability in the performance of the dorsal NME; and sex explained 37% of the variability in the performance of ventral NME.

**Conclusion:** The reference values and the cutoff points obtained could be used in clinical practice to identify patients with a subnormal NME. Sex is an important consideration when using both the test procedure and the reference values.

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Flexion mobilizations with movement techniques: the immediate effects on range of movement and pain in subjects with low back pain.

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**Objective:** This study investigates the immediate effects of flexion mobilizations with movement techniques (MWMs) on spinal range of movement in individuals with low back pain and also their impact on pain. A preliminary attempt has been made to describe the clinical profiles of subjects who were thought to benefit from MWMs.

**Method:** A small-scale explanatory study was conducted using a crossover design, placebo-controlled, with subjects and assessors blinded. After assessment by physiotherapists, 26 subjects with low back pain with pain on lumbar flexion, thought to be appropriate for treatment with MWMs, participated. Subjects received an MWM intervention and a placebo intervention in a randomized order. Lumbar spinal flexion and extension and pain during flexion were recorded immediately before and after each intervention, using double inclinometry and visual analogue scales.

**Results:** Mean spinal range of movement increased significantly with the MWM intervention, as compared with the placebo (true flexion: MWMs 49.2° [SD 16.4], placebo 45.3° [SD 14.1],  $P = .005$ ; total flexion: MWMs 76.7° [SD 22.4], placebo 69.7° [SD 21.5],  $P = .005$ ). Mean pain scores did not change.

**Conclusions:** The MWMs produced statistically significant, but small, immediate spinal mobility increases but no pain reduction when compared with placebo. By introducing clinical judgment into the subject selection process for the trial, 19 (73%) of 26 subjects benefited from MWMs techniques in

terms of range of movement and/or pain intensity, whereas 9 (35%) subjects showed such changes with the placebo intervention.

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Immediate effects of manipulation of the talocrural joint on stabilometry and baropodometry in patients with ankle sprain.

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**Objective:** This study assessed the immediate effects of talocrural joint manipulation on stabilometric and baropodometric outcomes in patients with grade II ankle sprain.

**Methods:** Fifty-two field hockey players (35 men and 17 women) between 18 and 40 years old (mean = 22.5 years, SD = 3.6 years) were included in this study. A simple blind, inpatient, placebo-controlled, and repeated-measures study was carried out. All the patients underwent a baropodometric study performed with a Foot Work force platform (4 times; pre-post placebo group and pre-post intervention group). The sample was subjected to two techniques of manipulative treatment: (a) talocrural joint manipulation and (b) posterior gliding manipulation over the talus. In a second instance, placebo manipulation was applied. Unilateral analysis of variance and multivariate analysis of variance were used for statistical analysis.

**Results:** The results in the intervention group revealed significant differences in the percentage of posterior load on the foot ( $P = .015$ ) and the percentage of bilateral anterior load ( $P = .02$ ) before and after the manipulation. The placebo group did not show any change in any of the variables except for area ( $P = .045$ ). Intergroup comparison revealed statistically significant differences in the increase in percentage of posterior load on the manipulated foot, percentage of bilateral posterior load, percentage of anterior load on the manipulated foot, and percentage of bilateral anterior load (with the exception of the total load on the foot).

**Conclusions:** The application of caudal talocrural joint manipulation, as compared with placebo manipulation, in athletic patients with grade II ankle sprain redistributed the load supports at the level of the foot.

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Influence of posture on the range of axial rotation and coupled lateral flexion of the thoracic spine.

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**Objective:** This study examines the influence of posture on the range of axial rotation of the thorax and the range and direction of the coupled lateral flexion.

**Methods:** The ranges of mid thoracic axial rotation and coupled lateral flexion were measured in 52 asymptomatic subjects (ages 18-43 years) using an optical motion analysis system. To examine the influence of posture on primary and coupled motion, we initiated axial rotation from a neutral sitting posture and from end-range thoracic flexion and extension.

**Results:** There was a significant decrease in the range of thoracic rotation in flexion compared with the neutral and extended postures ( $P < .001$ ). The mean range of coupled lateral flexion was 8.9% of the

axial rotation range in the neutral posture and increased to 14.3% and 23.2% in the extended and flexed postures, respectively. Patterns of coupled motion varied between subjects, but an ipsilateral pattern was more common in the flexed posture, whereas a contralateral pattern was more common in the neutral and extended postures.

Conclusions: The ranges and patterns of coupled motion of the thorax appear to be strongly influenced by the posture from which the movement is initiated. This has important implications in relation to the interpretation of clinical tests of thoracic motion and in consideration of mechanisms of development of thoracic pain disorders.

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Should plain films of the lumbar spine be taken in the posterior-to-anterior or anterior-to-posterior position? A study using decision analysis.

*Kenneth J. Young, DC*

Objective: The objective of this study was to mathematically propose the best position for frontally oriented lumbar spine radiographs.

Methods: Decision analysis with a decision tree was used in this study. Factors used in the analysis were radiation dose, ease of implementation, image quality, cost, and patient comfort. Data on these factors were gathered by reviewing the literature.

Results: Radiation dose was found to be the only factor with significant differences between the posterior-to-anterior (PA) position and the anterior-to-posterior (AP) position, and PA films gave lower doses to sensitive organs as compared with AP films. There is also some evidence that PA films show better overall image quality as compared with AP films.

Conclusions: Based on the information used in this study, lumbar spine plain-film radiographs should be obtained in the PA position.

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Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials.

*Howard Vernon, DC, PhD, Kim Humphreys, DC, PhD, Carol Hagino, MBA*

Objective: This study provides a systematic analysis of group change scores in randomized clinical trials of chronic neck pain not due to whiplash and not including headache or arm pain treated with manual therapy.

Methods: A comprehensive literature search of clinical trials of chronic neck pain treated with manual therapies up to December 2005. Only clinical trials scoring above 11.5 (Amsterdam-Maastricht Scale) were included in the analysis.

Results: From 1980 citations, 19 publications were selected. Of the 16 trials analyzed (3 were rejected for poor quality), 9 involved spinal manipulation (12 groups), 5 trials (5 groups) were for spinal mobilization or nonmanipulative manual therapy (1 trial overlapped), and 2 trials (2 groups) involved massage therapy. No trials included trigger-point therapy or manual traction of the neck. For manipulation studies, the mean effect size (ES) at 6 weeks for 7 trials (10 groups) was 1.63 (95% confidence interval [CI], 1.13-2.13); 1.56 (95% CI, 0.73-2.39) at 12 weeks for 4 trials (5 groups); 1.22

(95% CI, 0.38-2.06) from 52 to 104 weeks for 2 trials (2 groups). For mobilization studies, 1 trial reported an ES of 2.5 at 6 weeks, 2 trials reported full recovery in 63.8% to 71.7% of subjects at 7 to 52 weeks, and 1 trial reported greater than 2/10 point pain score reduction in 78.3% of subjects at 4 weeks. For massage studies, 1 reported an ES of 0.03 at 6 weeks, whereas the other reported mean change scores of 7.89/100 and 14.4/100 at 1 and 12 weeks, respectively.

Conclusions: There is moderate- to high-quality evidence that subjects with chronic neck pain not due to whiplash and without arm pain and headaches show clinically important improvements from a course of spinal manipulation or mobilization at 6, 12, and up to 104 weeks posttreatment. The current evidence does not support a similar level of benefit from massage.

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#### Sacral fatigue fracture in a female runner: a case report.

*Daniel W. Haun, DC, Norman W. Kettner, DC, Terry R. Yochum, DC, Richard L. Green, DC*

Objective: This case report describes and discusses the clinical presentation, diagnosis, and management of a patient with a sacral fatigue fracture.

Clinical Features: A 26-year-old female long-distance runner presented with nonspecific low-back and buttock pain that prevented her from training.

Intervention and Outcome: Radiographic findings on the patient's lumbar spine and pelvis were interpreted as normal. Single-photon emission computed tomography and magnetic resonance imaging were performed, revealing a fatigue fracture of the left sacral ala. The patient discontinued training for 6 months and gradually returned to running.

Conclusions: A high index of suspicion should prompt investigation with skeletal scintigraphy, computed tomography, or magnetic resonance imaging. Sacral stress fractures may respond well to conservative measures if diagnosed in a timely fashion.

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#### Twenty-year-old pathogenic "active" postsurgical scar: a case study of a patient with persistent right lower quadrant pain.

*Alena Kobesova, MD, Craig E. Morris, DC, Karel Lewit, MD, DS, Marcela Safarova, PT*

Objective: This case study describes a patient with persistent right lower quadrant and low back pain who experienced relief after manual mobilization techniques of an old appendectomy scar.

Clinical Features: A 53-year-old man with pain in the right lower quadrant of the abdomen and low back had previously failed several trials of multimodal treatments. He had an irritated old appendectomy scar in the right lower quadrant. Degenerative disk findings were also noted in the upper lumbar spine.

Interventions and Outcomes: Manual mobilization of the superficial and deep layers of the scar tissue was applied. The patient experienced an immediate pain reduction after the first treatment. Nine treatments in total were administered to the patient.

Conclusions: Assessment and treatment of "active" scar tissue may comprise an important component of the management of locomotor dysfunction and associated pain syndromes.

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