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Editorial Staff

Reliability of manual skinfold tests in a healthy male population.

*Paul Rouwmaat, Dirk Everaert, Karel Stappaerts, PhD, and Geert Aufdemkampe.*

**Objective:** To assess the intra- and interexaminer agreement of a manual skinfold thickness test and of a manual skinfold compliance test. The relation between the weekly routine of the examiners and the intra-examiner reliability was also assessed for both tests.

**Design:** This is a reliability study of a common palpatory procedure to assess skinfold thickness and skinfold compliance. Twelve healthy subjects were palpated twice in two sessions and by 12 examiners.

**Setting:** The study was conducted at the Polytechnic of Utrecht (the Netherlands), Faculty of Health Care, Department of Physiotherapy.

**Subjects:** Healthy males recruited from students of the Polytechnic of Utrecht (the Netherlands), Department of Physiotherapy.

**Results:** The intra-examiner agreement ICC(3.1) was .25 for skinfold thickness and .28 for skinfold compliance. The inter-examiner agreement ICC(2.1) ranged from .01 to .24. The Pearson correlation coefficient between the examiners age and routine versus intra-examiner agreement ranged from -.41 to .23 (nonsignificant).

**Conclusions:** The intra- and interexaminer agreement of the manual skinfold test produced poor to fair reliability. The correlation between the examiners weekly routine ranged from low negative to little (if any). This study shows a lack of reliability of palpatory tests for skinfold thickness and skinfold compliance. This outcome agrees with results of studies as found in the literature.

**Key Indexing Terms:** compliance; connective tissue; palpation; reproducibility of results.

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The effects of real life X-axis vertebral translation on projected Y-axis vertebral rotation.

*Roger Coleman, DC, Bert Bernard, Deed Harrison, DC.*

**Background:** Few studies have quantified the projection and distortion errors that occur in AP radiographs.

**Objectives:** To quantify the projection and distortion errors on AP radiographs caused by lateral translation of the vertebrae. To demonstrate the effect of vertebral shape on projection errors.

**Study design:** Three models of increasing complexity were constructed in order to document the distortion. Model-1, consisted of three metal pins embedded in a piece of metal tubing which was x-

rayed in three positions. Model-2, is a simple model of the x-ray beam mounted on a wooden platform, allowed for translation of a vertebral model in a simulated x-ray beam and the measurement of projected points of contact between the model and rays of the simulated beam. Model-3, is a computer simulation of the x-ray beam, in which a vertebral model was translated laterally to varying locations. The projected points of contact between the simulated rays and the vertebral body margins and lamina junction were measured. Model-3 also showed that vertebral body shape has a large effect on the projected axial rotation. Two other simple models were created and discussed in relation to shape-dependent projection errors.

Results: X-axis translation results in projected y-axis rotation. Increasing magnitudes of x-axis vertebral translation results in increasing magnitudes of projected y-axis vertebral rotation. The projected rotation is also influenced by vertebral shape.

Conclusion: We have shown that 3-D lateral translation projects as axial rotation on the AP radiograph. Projection error is largely influenced by the shape of the object and by the increasing obliquity of the rays of the x-ray beam. This would seemingly create confusion and invalidate spinal listings of vertebral position obtained from the AP radiographic image.

Key Indexing Terms: radiographic; magnification; anatomic models; spine.

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Informed consent: An Australian case study.  
*Jennifer Jamison, MB, BCh, PhD, EdD.*

Objective: Informed consent, as practiced in Australian chiropractic practice, was explored by means of a collective case study.

Design: Twenty-one chiropractic practices were visited and 25 chiropractor-patient units explored. Purposive sampling of practitioners was undertaken using a maximum variation strategy. Convenience sampling of patients was performed within each participating practice. Data was gathered from each chiropractor-patient unit, consisting of one practitioner and usually five patients, by means of practitioner interview, patient questionnaire and interview and, in certain cases, practice observation. Thematic analysis of the interviews were correlated with information derived from the patient questionnaires and validated by selective practice observation. Data was compared within and across chiropractor-patient units.

Results: Consent for chiropractic care was usually implied. Chiropractors in this study seldom obtained formal verbal, and never written, informed consent. New chiropractic patients were nonetheless informed about the procedures which the chiropractor intended to perform, and their acquiescence was taken as consent. Participants seldom discussed the potentially serious consequences of chiropractic adjustment but did actively attempt to identify and avoid exposing at risk patients. Patients were often counselled about potential muscle soreness following the chiropractic adjustment. The behavior of chiropractors in this study was consistent with their patients' expectations.

Conclusion: This study suggests that chiropractic behavior in Australian clinical practice meets the moral, but not all of the legal, requirements for informed consent.

Key Indexing Terms: chiropractic; informed consent.

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The reliability of measuring active and passive cervical range of motion: an observer blinded and randomized repeated measures design.

*Henrik Christensen, DC, MD, Niels Nilsson, DC, MD, PhD.*

**Purpose:** To study the intra- and interexaminer reliability of measuring active and passive cervical range of motion (ROM).

**Study design:** Observer blinded, randomized repeated measures of active or passive cervical ROM by two different examiners.

**Setting:** Institute of Medical Biology (Center of Biomechanic) at Odense University. **Participants:** 40 asymptomatic students, 20 of each gender, aged 20-30 from the University of Odense.

**Intervention:** Measurements of either active or passive cervical ROM using the electrogoniometer CA-6000 Spine Motion Analyzer by two blinded examiners. Each subject was measured four times. Twice by each examiner in random order, using a mean-of three measurements protocol.

**Main Outcome Measures:** The reliability within and between examiners in active and passive ROM was assessed by the intraclass correlation coefficient (ICC (2,k)). Coefficient of variation (CV) was used to assess the reproducibility within and between examiners in active and passive ROM.

**Results:** Intraexaminer ICCs for active ROM ranged from 0.81-0.97 and for passive 0.85-0.98. The interexaminer ICCs for active ROM ranged from 0.76-0.98 and for passive 0.65-0.95.

Intraexaminers CV for active ROM ranged from 2.42-10.93 and for passive 1.82-5.77. The interexaminers CV for active ranged from 2.30-14.43. and for passive 2.58-10.93.

**Conclusion:** Active and passive ROM could be measured reliably in six movement directions by the same examiner. Measurements were reliable, when measured by different examiners, for active cervical ROM in six movement directions and passive total ROM in three motion planes.

**Key Indexing Terms:** cervical spine; passive range of motion; reproducibility of results.

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A conservative approach for a patient with traumatically induced urinary incontinence.

*David Stude, DC, Thomas Bergmann, DC, Bradley Finer, DC.*

**Objective:** To discuss a conservative management plan for a patient suffering from diurnal enuresis.

**Clinical Features:** A 12-year-old female suffered from a chief complaint of left flank pain and involuntary urine loss apparently beginning a short time after falling backwards and landing on her coccyx. She had to wear a tampon prophylactically throughout each day for over a year due to unpredictable urinary incontinence.

**Intervention:** Manual adjusting procedures and soft tissue therapy were applied initially. Procedures were modified later to include an intrarectal technique. The quantity of urine loss decreased slowly with the initial treatment approach, but never resolved completely. The flank pain also reduced somewhat but never ceased altogether. After the introduction of the intrarectal technique, additional progress was reported and both the flank pain and urinary incontinence resolved completely. A 4 year follow-up confirmed complete resolution.

**Conclusions:** Conservative care helped an adolescent child suffering from traumatic urinary

incontinence.

Key Indexing Terms: urinary incontinence; autonomic nervous system; chiropractic manipulation.

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Comparative Efficacy of Conservative Medical and Chiropractic Treatments for Carpal Tunnel Syndrome: A Randomized Clinical Trial.

*P. Thomas Davis, DC, James Hulbert, PhD, Kassem Kassak, PhD, John Meyer, DC.*

Objective: To compare the efficacy of conservative medical care and chiropractic care in the treatment of carpal tunnel syndrome.

Design: Two-group, randomized, single-blind trial with nine-weeks treatment and a one-month follow-up interview.

Setting: Wolfe-Harris Center for Clinical Studies at Northwestern College of Chiropractic in Bloomington, MN. Patients: Ninety-one subjects, of 96 eligible, who reported symptoms, confirmed by clinical exam and nerve conduction studies.

Interventions: Interventions included ibuprofen (800 mg. t.i.d. for one week, 800 mg. b.i.d. for one week, and 800 mg. p.r.n. to a maximum daily dosage of 2400 mg. for seven weeks) and nocturnal wrist supports for medical treatment. Chiropractic treatment included manipulation of the soft tissues and bony joints of the upper extremities and spine (three treatments/week for two weeks and two treatments/week for three weeks, and one treatment/week for four weeks), ultrasound over the carpal tunnel, and nocturnal wrist supports.

Main Outcome Measures: Outcome measures were pre-post assessments of self-reported physical and mental distress, nerve conduction studies and vibrometry.

Results: There was significant improvement in perceived comfort and function, nerve conduction, and finger sensation overall, but no significant differences between groups in the efficacy of either treatment.

Conclusions: Carpal tunnel syndrome associated with median nerve demyelination but not axonal degeneration may be treated with commonly-used components of conservative medical care or chiropractic care.

Key Indexing Terms: carpal tunnel syndrome; chiropractic; electrodiagnosis; randomized controlled trial.

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Carpal Tunnel Syndrome: Conservative and Non-conservative treatment. A Chiropractic Physician's Perspective

*P. Thomas Davis, DC, James Hulbert, PhD.*

Objective: To discuss the treatment of carpal tunnel syndrome including indications for referral to medical evaluation and/or co-management.

Data Source: Over 200 articles published in the health care literature from 1963 to 1997 and indexed on Medline, concerning conservative and surgical intervention for CTS.

Indexing terms used: carpal tunnel, combined with keywords conservative and surgery.

**Study Selection:** Reports involving either conservative or nonconservative treatment for CTS or original descriptive reports of surgical techniques of carpal tunnel release.

**Data Extraction:** Indications and contra-indications for each conservative and surgical option. Concise and general descriptions of manual, medical, and surgical interventions in current use, including summaries of the benefits and risks of each treatment.

**Data Synthesis:** The review is presented as a discussion of diagnostic technique and conservative and surgical treatments for CTS currently used in North America.

**Conclusions:** Recommendations are that carpal tunnel syndrome, accompanied by demyelination but without degeneration, can be treated initially with conservative medical or with manual procedures.

**Key Indexing Terms:** carpal tunnel syndrome; chiropractic; nerve compression syndromes; surgery.

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