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Editorial Staff

A Study of Two Stretching Techniques for Improving Hip Flexion Range of Motion
Henry Pollard, Grad.Dip.Chiro.,Grad.Dip.App.Sc., and Graham Ward, Ph.D.

Objectives: To compare the effectiveness of a spinal (suboccipital) stretching technique to aperipheral stretching technique.

Design: Clinical cohort study. Setting: Macquarie University Centre for Chiropractic Outpatient Clinic.

Method: A reliable hand-held dynamometer was used to determine the end point of range of motion (ROM) before and after the application of a treatment. Three groups of subjects were treated: cervical stretch, hip stretch, and sham/placebo. Range of motion of the hip in flexion (straight leg raise) was used as the independent variable.

Sample: Sixty randomly allocated university students aged between 18 and 35 years.

Results: The two stretching treatments resulted in increased flexion range of motion (ROM) at the hip. Statistical analysis revealed that only the sub-occipital stretching procedure increased hip flexion ROM significantly.

Conclusion: The results such that manual therapy of the neck may have a role to play in the treatment of extra-spinal lower limb musculoskeletal conditions. (*J Manipulative Physiol Ther* 1997; 20:000-000)

Key Indexing Terms: Chiropractic; Cervical Vertebrae; Hip; Muscles.

A Comparison Between Referred and Non-Referred Patients in Chiropractic Practices in Norway.
Anfinn Kilvaer, D.C., Georg Rasmussen, D.C., Trond Soot, D.C., and Sigmund Kalvenes

Objective: This study compares patients referred to chiropractic practices from medical doctors with patients coming directly to the chiropractors offices without referral.

Background: As Norway has legislation requiring referral as a precondition for refund by the national social security system, we have a unique opportunity to examine current practice when it comes to musculoskeletal conditions and to compare demographic, diagnostic and other data between the referred and non-referred groups. Furthermore, we wanted to see if any changes in the practice of referral had occured since our two earlier studies of 1979 and 1989 were published, which pointed out severe deficiencies both in medical examination practice and referral practice.

Methods: Questionnaires recorded on a continous basis by participating members of the

Norwegian Chiropractors Association during anamnesis of the first 25 new patients after a preset date. 98 out of 140 chiropractors participated and returned 2401 questionnaires.

Results: The most interesting result was a marked difference in average sick-leave time between the referred and the non-referred groups at the time of initial contact. While the referred patients had been on sick-leave an average (mean) of 22.9 days before commencing chiropractic treatment, the corresponding figure for the non-referred was 8.5 days. Otherwise the two groups were identical, or close to identical in all tested aspects. There were still deficiensies in the medical doctor's examination procedures and referral practices, but some improvement had occured, and chiropractic was more frequently the first choice of treatment in 1992 than in 1979 and 1989.

Conclusion: Recent studies have shown chiropractic treatment to be a cost efficient therapy for back related conditions. The findings in our study indicate that the result of the present system of referral is substantially longer sick-leave time and delayed onset of chiropractic treatment. Some improvements in referral practice has, however, occured since 1979. It is generally accepted that early, effective intervention is the premier method to prevent chronicity. This is not promoted by the present Norwegian system of referral which we in earlier studies have shown to be inconsistent and expensive for both the patient and the social security system. (*J Manipulative Physiol Ther* 1997; 20:000-000)

Key Indexing Terms: Chiropractic; Medical Referral; Sick-Leave Time; Cost Efficiency; Referral Practice; Patient Demographics.

X-Ray of Trunk Rotation
Karel Lewit, M.D.

Objective: To establish the mechanism of thoracolumbar spine trunk rotation, along with its restriction.

Design: Patients with one-sided rotation restriction were examined seated on a chair with the pelvis fixed in neutral position, at maximum right and left trunk rotation, before and after mobilization of movement restriction. AP X-ray pictures were taken with a horizontal beam on a vertical X-ray cassette.

Setting: Neurological University clinic.

Main Outcome Criteria: Assessment of rotation and side-bending of the thoracolumbar spine (a) on the normal and the restricted side, and (b) after mobilization.

Results: In all cases, there was both (coupled) rotation and side flexion very much as during side-bending, except that the thoracolumbar junction was frequently near midline; and, in such cases, the thoracic spine above has bent in the opposite direction. Both rotation and side-bending started at L5 and continued gradually in a cranial direction without a noticeable maximum at any level.

Conclusions: Although it is generally assumed that the configuration of the lumbar zygapophyseal joints precludes axial rotation in the lumbar spine, during trunk rotation a coupled movement of side bending plus rotation takes place in the lumbar spine and continues without a noticeable break into the thoracic spine. The site of movement restriction which usually appears to be located at the thoracolumbar junction cannot be visualized by X-rays. (*J Manipulative Physiol Ther* 1997; 20:000-000)

Key Indexing Terms: Thoracic Vertebrae, Lumbar Vertebrae; Motion. *JMPT*, September 1997
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EFFECT OF ANTERIOR WEDGING OF L1 ON THE MEASUREMENT OF LUMBAR LORDOSIS: COMPARISON OF TWO ROENTGENOLOGICAL
Nicola A. Worrill, Ph.D., Cynthia K. Peterson, R.N., D.C.

Objective: To determine whether the choice of either the superior or inferior endplate of the L1 vertebra, as the proximal landmark for the measurement of lumbar lordosis, could significantly affect the categorization (ie. hypo/hyper lordotic or normal) of that lordosis in subjects where the L1 vertebra is wedged anteriorly.

Design: Concurrent validity. Setting: The Anglo-European College of Chiropractic teaching clinic.

Selection: A total of 260 files were screened from new patient files at the clinic from 1980 onward. A total of 96 films fulfilled the inclusion criteria, which were: the patient was 20-50 years old at the time of presentation, and no evidence of severe degeneration, scoliosis, bony deformity or poor radiographic quality. Wedging of the L1 vertebra in excess of 2mm was measured in 70 radiographs, and these films were used for the two measurements of lumbar lordosis.

Outcome measures: The lumbar lordosis was roentgenometrically measured on lateral lumbar radiographs.

Results: Seventy-three per cent of the x-rays meeting the inclusion criteria showed wedging of the L1 vertebra in excess of 2mm. Using the Student's t-test, the mean lumbar lordosis, measured using the superior endplate of L1 as the proximal boundary for measurement of the lordotic angle, was 52.0(+/-11.82(and was significantly lower ($p<0.0001$) than the mean lumbar lordosis measured using the inferior endplate of L1, which was 59.06(+/-12.01(. The Kappa analysis performed to determine the level of agreement in the categorization of the lumbar lordosis using these two methods indicated that statistically ($K=0.394$) there was poor agreement in the categorization of the lumbar lordosis between the two methods. An intra-examiner reliability study indicated significant intra-examiner agreement using both methods.

Conclusion: The choice of landmark (ie, superior or inferior endplate of L1) can significantly affect the value of the lumbar lordosis angle and its subsequent categorization as hypo/hyper lordotic or normal in patients where this vertebra is wedged anteriorly. In view of the high incidence of this anatomical variant, L1 might not necessarily represent the best choice of landmark for the measurement of the lumbar lordosis. However, further work is necessary to determine which method is the most accurate and to investigate the validity of the suggestion that L2 may be a reasonable alternative. (*J Manipulative Physiol Ther* 1997; 20:000-000)

Key Indexing Terms: Lumbar vertebrae; Radiography; Validity.

A Comparison of Physical Characteristics Between Patients Seeking Treatment for Neck Pain and Matched Healthy Individuals
Alan Jordan, D.C., Jesper Mehlsen M.D., Keld Ìstergaard D.C., M.D.

Objective: To compare physical characteristics of the cervical musculature including maximal isometric strength of the flexors and extensors, relative isometric endurance of the extensors and

the active range of motion in extension in a group of patients seeking treatment for chronic neck pain and a group of age-matched healthy individuals.

Setting: Department of Medical Orthopaedics, National University Hospital, Denmark.

Methods: One hundred and nineteen chronic neck patients underwent physical testing for active range of motion in extension, maximal isometric torque in extension and flexion as well as relative isometric endurance in extension prior to entering a clinical controlled trial studying the treatment of chronic neck pain. Their results were then compared to eighty age matched healthy individuals.

Results: The reliability study demonstrated good within day and day to day reproducibility for active range of motion. Active range of motion was significantly reduced in female patients but not in all male age groups. Patients exhibited clinically and statistically significant reductions in maximal isometric torque in both the flexors and extensors of the cervical spine, with the greatest reduction seen in the extensor muscle group. Most patient groups demonstrated a significant reduction in relative isometric endurance of the extensors.

Conclusions: In agreement with most low-back comparisons between patients and age- matched healthy individuals, the greatest relative muscular deficiencies appear to be in the extensor muscle group. Additionally, most patients exhibit a significant decrease in active range of motion during extension. The clinical utility of physical measurements has not been firmly established. (J Manipulative Physiol Ther 1997;20:000-000)

Key Indexing Terms: neck pain, strength, endurance, range of motion, rehabilitation.

Thermal Asymmetry of the Upper Extremity in Scalenus Anticus Syndrome, Leg Length Inequality and Response to Chiropractic Adjustment
Gary A. Knutson, D.C.

Objective: To describe a case of a vasomotor, vascular form of thoracic outlet syndrome causing upper extremity thermal asymmetry, and discuss a single subject case study (N-of-1) comparing the correlation of a subjective test for putative atlas vertebral subluxation complex (supine leg length inequality) with a single blinded objective measurement [temperature differential (delta ^{o}T)] on the dorsum of the hands.

Clinical Features: A 71 year old female with a cold, painful right hand and chronic neck pain sought chiropractic evaluation. There was a left head tilt and muscular hypertonicity with fibrous bands in the opposite scalenes and sternocleidomastoid. Thermographic examination revealed a large temperature differential (12^{o} F.) between the dorsum of the right and left hands with the superficial veins on the dorsum of the cold hand collapsed. Thoracic outlet provocation tests were negative. A left side leg length inequality potentially indicative of putative upper cervical subluxation was also noted. A diagnosis of presumptive thoracic outlet syndrome with vasomotor vascular complications subsequent to altered cervical biomechanics was made.

Intervention and Outcome: Treatment was limited to chiropractic upper cervical vectored, linear adjustment of the atlas vertebra. Temperature differential between the hands significantly improved after individual atlas adjustment(s) and in the long term.

Conclusion: Scalenus anticus syndrome and upper extremity thermal asymmetry may result from altered cervical biomechanics subsequent to atlas vertebral subluxation complex. Furthermore, the

supine leg check may be of value in determining the necessity of atlas adjustment. (*J Manipulative Physiol Ther* 1997;20:000-000)

Key Indexing Terms: Thoracic Outlet Syndrome; Chiropractic; Leg Length Inequality

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