
Poster Presentations

Successful Resolution of Chronic Constipation in Pediatric Patients With Adjustments to Sites of Vertebral Subluxation

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Background: Chronic constipation is a common condition as reflected in the \$800 million yearly spent on laxatives in the United States. Constipation is such a common problem in the pediatric population that it is the second most referred problem to the pediatric gastroenterologist and accounts for 25% of all visits. Between 5% and 28% of all children experience great difficulty with elimination of food waste, which is often accompanied with pain, fear, and avoidance. The symptoms of constipation are defined as infrequent or difficult evacuation of the feces. The ever-increasing use of complementary and alternative medicine (CAM) in adults is accompanied by use in children. Parent CAM users are three times more likely to use CAM for their children compared with non-CAM users. Chiropractic stands as the most popular type of CAM therapy for children and yet this is not reflected in the scientific literature. This paper describes the successful outcome of chiropractic care in pediatric patients with chronic constipation.

Clinical Features: All three patients were under the age of 2 years with bowel movements ranging from once per week to

every 3 to 4 days. This was accompanied with straining, pain, and rectal bleeding. Previous unsuccessful care involved medical advice with dietary changes (ie, increase fiber and fluid intake) and the use of cod liver oil or mineral oil.

Intervention and Outcome: Following a trial of chiropractic care using a combination of high-velocity, low-amplitude thrust-type care and Activator methods to sites of vertebral subluxations, the patients' constipation resolved, as demonstrated by an increased frequency in bowel movements once every 1 to 2 days without straining and pain.

Conclusion: This case series provides supporting evidence on the effectiveness of chiropractic care in children with chronic constipation. The authors advocate for further investigations in this field. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

A Survey of Parents on the Iatrogenesis Associated With Chiropractic Spinal Manipulative Therapy of Pediatric Patients: Results From a Practice-Based Research Study

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Background: There is a reported 9% incidence of treatment-associated aggravation following osteopathic manipulative therapy. A study of the iatrogenesis associated with pediatric spinal manipulative therapy (SMT) was performed based on parental survey in a practice-based research network.

Methods: This study was approved by the Institutional Review Board of Life University, Atlanta, Georgia. Geographical information of parent (gender, age, and level of

education completed) and child (ie, gender and age) was determined along with the child's presenting complaint(s), the number of office visits, and subjectively assessed treatment-associated iatrogenesis.

Results: Parents (222 females, 116 males, 1 unaccounted) contributed 239 pediatric cases consisting of 1735 office visits at an average of 7.26 visits. The parents were highly educated and were an average age of 35.59 years. Their

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children (113 females, 119 males, 7 not indicated) were an average age of 6.16 years. “Wellness care” ($N = 130$) along with complaints involving the cervical spine and lumbopelvis were common. Treatment-related changes were not mutually exclusive, with 163 parents reporting an improvement and 2 reporting an aggravation (ie, soreness and stiffness) with no complications. Approximately 47% ($N = 116$) reported improvements with their child’s presenting complaint (ie, decreased pain), while 67 reported unrelated improvement (ie, improved immune function).

Discussion: The findings of this study suggest that the incidence of iatrogenesis associated with chiropractic SMT of children as reported by their parents is relatively low.

Reported aggravations (0.008%) were self-limiting and did not deter the parent to continue care. No complications were reported.

Conclusion: This study provides supporting evidence on the safety and effectiveness of chiropractic SMT in children based on parental reports. The authors recommend continued research in this area to more accurately determine the true incidence and prevalence of the iatrogenesis (and its associated variables) associated with chiropractic SMT. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Developmental Delay Syndromes and Chiropractic

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Introduction: Issues regarding chiropractic treatment for various types of conditions such as developmental delay syndromes, while controversial to some, have some support in the literature. At this time, developmental delay syndromes such as attention-deficit/hyperactivity disorder (ADHD) have inconclusive etiologies. Although many consider that developmental delay disorders are solely genetic in origin, others have supported the concept that a subset of patients may have a trauma or other physical-related imbalances that could be contributory to the patient’s dysfunction.

Case Report: A case of fraternal twins is presented in which one twin’s developmental and emotional growth was notably delayed compared with her other twin. Chiropractic cranial care was rendered, which appeared to assist a positive outcome for the treated child.

Discussion: Perhaps a better way of interpreting chiropractic’s ability to help patients with learning disabilities, dyslexia, dyspraxia, and ADHD is viewing a specific subset of patients as having their conditions secondary to trauma. With developmental delay syndromes, there are various related possible chiropractic interventions, such as cranial

related therapies and upper cervical, cervical, and even treatment for pelvic-related dysfunction.

Conclusion: Since there is some question as to the causation of the various developmental delay syndromes, this ultimately leads to some lack of clarity on treatment options, particularly for children sensitive to medication or who do not chose medication as an option. Patients are seeking alternative care, and particularly care that offers low risk and some benefit should be brought to their attention. Although the studies are inconclusive, there is an emerging evidence base that does show chiropractic care can be involved in the treatment and care of patients with developmental delay syndromes. Greater study is needed to understand which patients might best benefit from chiropractic care and where co-treatment is indicated and to determine consistent outcome assessment tools to measure changes so mechanisms of care can be evaluated. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Chiropractic Care and Changes in Physical State and Self-Perceptions in Domains of Health-Related Quality of Life Among Public Safety Personnel

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Objective: The purpose of the study was to evaluate the impact of chiropractic care on the physical and self-perceived health benefits of public safety personnel.

Methods: The group was composed of nine males and one female ranging in ages from the mid-20s to the latter 60s. Each of the 10 participants received standard chiropractic care via clinic interns, supervised by licensed practitioners. Participants provided a case history, after which each received a chiropractic examination followed by an assigned plan of care. Prior to collection of data, participants signed a

human consent form approved by the college Institutional Review Board (IRB). Due to the noninvasive nature of chiropractic care, the study was granted exempt status. In addition to standard clinical protocols, each participant was asked to fill out a Health-Related Quality of Life Questionnaire. The questionnaires were scored and analyzed by an individual blinded to the care received by the participants.

Results: As a group, when all nine assessment tests were combined, the 10 volunteers’ physical findings decreased

from a total of 16.0 to 9.5 ($p = .020$). As well, when all nine categories were compared individually, the sum total was also significant ($p = .023$), although not all individuals improved in all nine of the categories. When all domains of health were compared for the 10 volunteers from initial assessment through an average of 5.5 months prior to reassessment, the group self-reported a significant increase in the five combined domains of the questionnaire, including the additional domain of overall wellness ($p = .000$). When the domains were assessed individually, the group self-assessed a significant improvement in the areas of physical state ($p = .004$), mental/emotional state ($p = .000$), and combined wellness ($p = .040$).

Using the Critically Appraised Topic Tool to Introduce Evidence-Based Practice Concepts in a Public Health Course

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Background: An introductory course in microbiology/immunology/public health was changed to include instruction about assessing studies on harm. Harm studies evaluate evidence of an exposure as causation of injury or harm to a patient. The critically appraised topic (CAT) tool has been selected to facilitate assessment of literature. The CAT tool is frequently recommended as a summary tool to evaluate clinical literature.

Methods: Students were introduced to harm studies through lecture and discussion. Students were then introduced to the CAT tool for assessing the validity and relevancy of literature. A journal article was assigned and students were given time to read the article. The class then completed the CAT for the assigned article as a group in class with my guidance. The class was then assigned the task of finding a harm article in the literature. A demonstration of using the PUBMED database provided the students with the database skills necessary to find this type of literature. Students then completed a CAT form using the knowledge gained in class.

Results: Students responded favorably to completion of the CAT tool in the classroom. Many reported a greater

Conclusion: Preliminary data suggest that even relatively short-term chiropractic care has demonstrable benefits for volunteers serving in acknowledged areas of stressful public service. Further study involving larger populations with a more diverse spread across high-risk, high-stress public servants accompanied with chiropractic care should be considered. (*This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.*)

understanding and appreciation of the usefulness of the tool after being guided through the form. Searching the literature for studies concerning harm allowed students to explore issues that they expect to encounter as practicing chiropractors. Many turned in CAT forms describing articles addressing smoking, obesity, cancer, and other health care issues. Students reported the use of the CAT across courses reinforced the methodology for accessing literature. Repeated exposure to similar CAT forms increased students' confidence when reading and evaluating journal articles.

Conclusion: Integrating evidence-based practice across the curriculum, throughout chiropractic science courses, clinical courses, and in the basic science course concerning public health, is a benefit to the student. The CAT is an invaluable tool for a relatively quick and comprehensive assessment of validity and relevancy of evidence. (*This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.*)

A Consideration of Evidence-Based Medicine and Its Implications for Chiropractors

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Objective: The challenge facing chiropractors lies in bridging the gap between evidence-based medicine (EBM) and patient-oriented care, but EBM is not universally accepted by chiropractors. The objective of this study was to gather data about where chiropractors search for evidence, to identify reading habits, to find which sources most inform and influence their practice, and to measure attitudes toward EBM.

Method: After a small-scale pilot study, an anonymous questionnaire, comprised of 23 questions in three sections, was distributed to 100 randomly selected chiropractors and returned by post for analysis.

Results: There was a 56% response rate. The majority of practitioners (54%) agreed that EBM improves patient care and that patients are interested in evidence-based care (43%), but 41% and 23% of respondents, respectively, were neutral on the matter. Sixty-six percent took part in postgraduate education in addition to the mandatory requirement. The top three preferred sources of evidence were continuing professional development (CPD) (25%), talking to colleagues (24%), and the practitioners' own clinical experience (24%). Journals and Internet sites were each only cited as a preferred choice by 11%. The most widely read journal was *Clinical*

Chiropractic (66%). Fifty-nine percent felt that the amount of research literature was overwhelming and that it reports conflicting results, but 42% felt that research was directly relevant to clinical practice.

Conclusion: While acknowledging the importance of EBM for patient care, a large proportion of chiropractors are still

neutral on the matter. Chiropractors appear to prefer personal evidence and paper-based sources to inform their practices. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Establishing a Normative Database for Joint Position Error

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Introduction: Vertigo and dizziness are commonly encountered complaints in the chiropractor's office, often as a result of whiplash injury. One significant component of proprioception is joint position sense (JPS). Disturbed afferent input has been postulated to affect JPS by several authors. Joint position sense can be determined by measuring the difference in distance between the neutral position of the neck and a blindfolded return to the original neutral position. This difference is known as joint position error (JPE) and can be used in the evaluation of injury and monitoring recovery of the proprioceptive component of traumatic neck injury. The purpose of this investigation is to expand the scope of prior investigations by establishing a normative database for JPE.

Methods: This is a cross-sectional study of 57 subjects. JPE was measured by using a laser pointer affixed to a construction-type helmet. The difference between the

subject's individually established neutral position and a blindfolded return to that position after right rotation determined JPE.

Results: There was a statistically significant difference between those subjects under 54 than those over 54.

Discussion: There were differences in JPE in this study compared with previous studies, possibly due to methodological reasons. Overall this method of measuring JPE has value to the practitioner, and an expanding normative database, which would include age divisions, would be of significant benefit. Exact protocols should be established in order to provide more consistent results and increased diagnostic utility. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Effects of Smoking on Intersegmental Motion in the Upper Thoracic Spine

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Objective: The aim of this study is to determine if smoking has an effect on intersegmental motion in the upper thoracic spine as correlated with the MERIC system.

Methods: Fifty participants who met the inclusion criteria were enrolled into the study: 25 smokers and 25 nonsmokers. Both groups were scanned by the ProAdjuster system three times for 3 days in the upper thoracic spine to determine the fixation, mobility, frequency, and motoricity of each segment.

Results: The results revealed an overall higher rate of fixation in both the smoker and nonsmoker groups at all three vertebral levels. However, there was a higher rate of fixation within the smoker group than the nonsmoker group ($p < .05$). The results showed that participants who smoked

had a higher fixation rate, which is energy needed to overcome inertia in the T1 spinal region. The mobility was higher in the nonsmoking group ($p < .05$). Frequency and motoricity showed no significant differences between the two groups ($p > .05$).

Conclusion: According to the data that has been compiled, there is significantly greater fixation in the smoking participants at T1, T2, and T3 spinal regions, when compared with the nonsmoking participants, although both groups had a higher than normal fixation rate. The nonsmoking participants also demonstrated higher mobility compared with the smoking group. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Poor Postural Control May Signal Autonomic Imbalance: A Cross-Sectional Pilot Study

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Background: Autonomic balance is often assessed using heart rate variability (HRV). Autonomic imbalance (low HRV state) is associated with multiple pathological conditions but has not been examined in relation to postural control. Postural control is the body's ability to reflexively sway within normal sway limits. Slower sway is thought to indicate greater stability, whereas faster sway suggests instability. This study seeks to determine if a relationship exists between autonomic balance and postural control.

Methods: A convenience sample was made up of 38 consenting, young adults. Persons with any condition that could affect postural control were excluded. Participants received a 5-minute HRV recording followed by a postural control assessment using a balance plate. The HRV median root mean successive squares difference was used to split participants into low- and high-HRV groups for postural control comparisons. Postural control was quantified as sway velocity. Sway velocity in excess of 1.9° per second was

considered abnormal. Chi-square goodness-of-fit test was performed to compare the observed versus expected occurrences of abnormal postural control in the groups.

Results: Significantly fewer high-HRV participants had abnormal postural control than could be expected by chance alone [$\chi^2(1, n = 38) = 5.4, p < .05$]. The incidence of abnormal postural control in the low-HRV group was higher than that observed in the high-HRV group but was no different than could be expected by chance [$\chi^2(1, n = 16) = 0.25, p > .05$].

Conclusion: The high-HRV group exhibited greater postural control than the low-HRV group. A postural exam may serve as a screening test to identify persons with autonomic imbalance, an indicator for manipulative therapy. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Reliability of Posticus Ponticus Assessment

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Introduction: Posticus ponticus is an anomaly that occurs on the atlas vertebra and has been referred to by various names such as ponticulus posticus and Kimmerle's anomaly. A reliability study was performed to determine how well faculty members at Sherman College agreed on the presence or absence of this finding.

Methods: The study was approved by the Sherman College Institutional Review Board. Three examiners each assessed 30 different lateral cervical films and were asked whether a posticus ponticus was present or not present. The radiographs used in the reliability study were selected from the Sherman College Radiology department film archives. The selection process for the films was such that approximately one-third of the films contained a posticus ponticus while two-thirds did not. The kappa statistic was used and calculated in a 2×2 spreadsheet table. Agreement, based on kappa, was as follows: < 0 = none, $0.0-0.19$ = poor, $0.20-0.39$ = fair, $0.40-0.59$ = moderate, $0.60-0.79$ = substantial, and $0.80-1.00$ = near perfect.

Results: Examiner B was unable to decide for one of the films, hence $n = 29$ films for examiner B. A comparison between examiner A and B revealed posticus ponticus present on 12 out of 29 films, not present on 16 out of 29, and disagreement for 1 out of 29 ($\kappa = 0.92$). For examiners A and C, these numbers were 11, 16, and 3, respectively, for 30 films ($\kappa = 0.79$) and for examiners B and C, 11, 17, and 1, also for 30 films ($\kappa = 0.92$).

Conclusion: There was substantial to almost perfect agreement between examiners, with interexaminer kappa scores ranging from 0.79 to 0.92. Consequently, these examiners demonstrated sufficient reliability for determining the presence or absence of posticus ponticus. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Development of an Interactive Functional Capacity Testing Site (Station) in a Clinical Educational Setting

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Objective: Functional capacities evaluation (FCE) may be defined as a systematic, comprehensive, and objective measurement of an individual's maximum abilities (activities of daily living or work). Our objective is to develop an interactive functional capacity testing site (station) defined as "low tech" that may correlate with patient demands in a clinical educational setting at a chiropractic institution.

Methods: A survey of four questions was given to the faculty working in an outpatient clinical setting to determine need and support for this plan.

Results: The average tenure of patient care at this institution was 3.8 years. Response to the survey showed that 75% of the faculty clinicians have seen <50 patients with work- and non-work-related injuries that affected their activities of daily living. Response to the survey also showed that 25% of the faculty clinicians have seen >100 patients with work- and non-work-related injuries that have affected the patients' activities of daily living. The survey results showed that 100% of the faculty clinicians would use, recommend,

and support the interactive functional capacity testing site (station) in a clinical educational setting at a chiropractic educational institution.

Conclusion: In a clinic that manages a working-class society, it would be prudent to have an interactive functional capacity site station. Critical benefits to the working people have been demonstrated in the scientific evidence. A probable need exists with obligation to our student interns for establishing a relevant interactive instrument (station) for testing an individual's performance skill level along with assessment outcomes that categorizes their measured activities of daily living. Establishing an interactive functional capacity station could essentially eliminate any undetermined performance ability levels that may otherwise exist as a void. Creating an interactive testing station for the benefit of functional ability or capacity testing will furthermore enable an interactive assessment tool that improves the performance and evaluation process. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Correlation of Outcomes for Mississippi River States

John Hart, DC, MHS, Sherman College of Straight Chiropractic

Purpose: The news in 2006 that Minnesota ranked first in health and Louisiana ranked last suggests that their connecting medium, the Mississippi River, or some other north-to-south phenomenon, might be a factor. Consequently, correlations were assessed for various outcomes for states along the Mississippi River in an effort to better understand possible mechanisms for the health disparity among states along the river. Doctor ratios were also studied for possible correlations with the health disparity.

Methods: Each state along the Mississippi River was ranked according to its north-to-south position. The position ranks were correlated with various health outcomes from the years 1999–2003. Doctor (physician and chiropractor) ratios for 2004 in these river states were also correlated with these outcomes.

Results: Health outcomes had a tendency to worsen from north-to-south. The outcomes also tended to worsen in states

with low doctor ratios. Chiropractors had a greater number of high or very high correlations for improved outcomes compared with physicians.

Discussion: Decreased health along the Mississippi River, from north-to-south, is likely a multifactorial phenomenon. Position of the states and their doctor ratios may play a role in the health disparity.

Conclusion: Correlation does not necessarily show causation but it may give clues. North-to-south position of a state along the Mississippi River appears to be a risk factor for its health rank. Chiropractors had stronger correlations for improved health outcomes when compared with physicians. Further study is needed to determine possible underlying causative mechanisms such as the quality of drinking water and quality of health care delivery. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Thermal Patterns and Health Perception

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Introduction: Thermal pattern analysis is thought to be an indicator of health. However, the validity of this concept has not been established. To further investigate the possible relationship between thermal pattern analysis and health perception, thermal pattern percents were compared with corresponding SF-12 health survey results.

Methods: The study was approved by the Sherman College Institutional Review Board. Sixty-eight students received paraspinal thermal scans with 1 minute of acclimation, on three visits, 1 week apart. Each scan produces three graphs or channels; one for each of left and right sides of the spine and a delta or difference between left and right. The scans were imported into a thermal pattern calculator (TPC) providing a percent similarity between two scans. The TPC percents were compared with corresponding SF-12 scores.

Results: There were no significant findings in the left or delta channel. There was a significant decrease in mental health perception in participants having a right channel TPC percent of 70.8 or higher.

Conclusion: Participants in this study having a right channel TPC percent of 70.8 or higher tended to express lower mental health perception. The study is considered a preliminary inquiry due only to the small sample size. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

A Model for Implementing Health-Oriented Catering for Chiropractic Events

Patricia M. Jestel, BS, and **Laurie Mueller**, DC, Palmer College of Chiropractic

Introduction: Patients and professionals across the country are more interested in health and wellness issues now than at any other time in our history. This study was implemented to create a health-oriented catering model for chiropractic seminar events and to provide comparative analyses for nutritional and cost factors to move toward this model.

Methods: A survey was prepared and sent to event planners that work with various chiropractic organizations. The survey included questions on what they currently serve at seminar events and asked for limiting factors and innovative ideas that have been implemented in their planning to incorporate more healthful food. Various purveyors and caterers were also interviewed to glean insights on what options are being offered and what obstacles are encountered when catering events.

Results: The survey results overwhelmingly reflected that the profession is painfully aware of the need for better food. Cost comparison results were received from two professional executive chefs. Results indicated that healthy menu choices

could replace the more traditional not-so-healthy choices with minimal changes to the budget allocated.

Discussion: Judging from the acquired survey information it appears that many organizations do not provide healthy food because they are not sure how to obtain it or if they can afford it. Others feel that their participants are not ready for the "healthy foods" compared with a more traditional menu of event food. Our findings show that the potential to recreate the entire menu within budget is economically feasible.

Conclusion: As a profession that is focused on preventative health, we need to take the lead on the important area of nutrition and incorporate as many healthy options as possible at our own events. This model represents a feasible solution for all health organizations to move toward a healthier menu at our educational events. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Endopelvic Fascial Tension on the Inferior Hypogastric Plexus and Its Relevance to Somatovisceral Dysfunction

Ian P. Johnson, McTimoney College of Chiropractic

Introduction: Pathophysiological changes in viscera due to nerve tension are often proposed, but there is little direct evidence of how this might occur. In this study, those anatomical structures most likely to create tension on the autonomic nerve plexus that supplies most of the pelvic organs have been examined.

Methods: Cadaveric observations were made on the effects of visceral displacement on movement of the endopelvic fascia containing the inferior hypogastric plexus.

Results: The plexus was most easily tensioned on the left by endopelvic fascial movement at the rectosigmoid

junction and bilaterally via the broad ligament of the uterus. The plexus did not cross any vertebral joints and was not tensioned via traction on its hypogastric nerve contribution.

Conclusion: Pelvic autonomic nerve tension is most easily created by visceral movement rather than vertebral movement. This may be relevant to those hypotheses on pelvic organ dysfunction and manual therapy that assume viscerosomatic nerve interactions. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

A Vision of Chiropractic: A Study of Chiropractic Spinal Manipulative Therapy on the Improvement of Visual Field

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Objective: Chiropractic spinal manipulative therapy (CSMT) is one of the effective ways used by many chiropractors. This study sought to observe visual field changes after CSMT. The results would shed the light on the chiropractic intervention to improve the performance of the athletic and geriatric patients.

Methods: A total of 83 subjects (44 females and 39 males) underwent CSMT on cervical spine, elbow, and wrist. Another 30 subjects who underwent friction massage were used as controls. The visual field of all subjects was taken before and after manipulation, and statistic analysis was performed to compare the visual field changes.

Results: In control group, there was no significant visual change before and after friction massage ($p > .05$). In the CSMT group, significant visual field improvement was found

in 78% of subjects after giving chiropractic manipulation ($p < .05$).

Discussion: The data of this study suggested that the improvement of visual field in the CSMT group was the result of chiropractic spinal manipulative therapy, since there was no such improvement shown in control subjects. Also the improvements were bilateral in response to unilateral manipulation. The mechanism of CSMT's effect on the visual field remains unknown. On average, the visual field was improved after a single treatment of CSMT in accordance with balancing between the right and left eye of the visual field. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

The Cradle of Chiropractic Education in South Korea: The Chiropractic Program of HanSeo University

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Introduction: Chiropractic was introduced into South Korea 35 years ago. Since then, many short-term non-government-approved chiropractic programs had been running in Korea. In 1997, HanSeo University started its government-approved regular chiropractic program affiliated with Royal Melbourne Institute of Technology (RMIT). The goal of the program is to train world-class chiropractors who may contribute their knowledge and skill to the Korean health care system. This

study was designed to compare the HanSeo chiropractic program with other programs in the world, as well as non-government-approved chiropractic programs running in Korea.

Methods: The data for this study were collected from a survey questionnaire, personal contact, and websites. All data were collected and analyzed to be compared for this study.

Results: The total program hours of HanSeo University were 4888. The total program hours of Palmer College of Chiropractic (PCC) and RMIT were 4650 and 4031, respectively. There were only 135 and 160 hours for two well-known non-government-approved chiropractic programs. In terms of faculty, there were 30 faculty members with DC and PhD degrees in HanSeo University, 135 in PCC, and 60 in RMIT.

Discussion: The results indicated that the HanSeo chiropractic program is comparable to the programs of other accredited chiropractic schools. The HanSeo chiropractic program met the Council on Chiropractic Education criteria of an accredited chiropractic program and World Health

Organization guidelines. When compared with other non-government-approved chiropractic programs in Korea, the HanSeo chiropractic program is superior in terms of teaching time, quality of teaching faculty, and curriculum. This study also revealed the difficult situation of chiropractic education in Korea. In order to promote chiropractic in Korea, support from other countries is needed. The results of this study could be used to develop the right teaching strategies for faculty and learning tactic for chiropractic students. (*This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.*)

A Study to Assess Students' Awareness of, Usage of, and Satisfaction With an Undergraduate College's Support Groups and Academic and Administrative Departments

Mandy Kendall, Christina Cunliffe, and Ian Johnson, McTimoney College of Chiropractic

Objectives: Expectations of what services a college should provide can result in increasing competition among colleges and the courses they can offer. Information could be used by the college for any future improvements to these support systems. The objective was to investigate students' awareness of, usage of, and satisfaction with the support systems and academic/administrative departments at a chiropractic college.

Methods: After a small-scale pilot study, data relating to the students' demographics, knowledge of, and satisfaction with the college's support systems were collected from a 17-question questionnaire designed for this project. The data were analyzed overall, as well as by year. All 170 students at a chiropractic college during the 2006 academic year received the questionnaire. A total of 128 (75% response rate) were returned; all years had a response rate of more than 50%.

Results: Students were satisfied overall with the various departments, particularly the Library (78%) and the Course Office (78%). Support in practical sessions was "enough" (45%) to "plenty" (26%), but support in lectures was judged in comparison "not enough" (24%) and "almost enough" (27%). Awareness of Year Tutors had increased, with 89% of year 1 students being aware of them compared with only 59% of year 5 students. Student representatives were consistently used most, with 50% to 70% of students across the year groups having contacted them up to five times.

Conclusion: Students are aware of and generally satisfied with all support groups in the college. Student representatives were the most often and consistently used. (*This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.*)

Expanding the Role of Chiropractic in the Health Care System by Building Multidisciplinary Relationships

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Introduction: The utilization of chiropractic services within the general population is low; therefore, the role that chiropractic care plays in the health care system is minor. One strategy for increasing its role is building multidisciplinary relationships with other health care providers. Over the past year, Cleveland Chiropractic College in Kansas City, Missouri has formed a multidisciplinary practice with the Kansas City Free Health Clinic.

Methods: We began seeing patients on a biweekly basis, 3 hours per day, using a gated system. This evolved into a system where the chiropractor became a portal-of-entry physician. The chiropractic clinic provides patient consultation, examination, and adjustments.

Results: The demographic makeup of the chiropractic patients mirrors the demographics of the entire Kansas City

Free Health Clinic: 55% male, 43% female, 2% undeclared, 41% Caucasian and African American, 6% Hispanic, and 12% undeclared. As of the spring of 2007, the chiropractic clinic has seen 151 new patients totaling 856 visits, averaging 9.7 visits per day and 5.7 visits per new patient. Twelve interns have participated in the program totaling 61 participation hours. While a formal outcome evaluation system has not yet been established, there is sufficient subjective evidence to conclude that patient satisfaction with the chiropractic services has been rated very high. Due to the success of the residency program, the chiropractic clinic is expanding from 2 to 5 days and from 6 to 15 hours per week. Student interns will now be allowed to perform all aspects of care and obtain graduation credits.

Discussion and Conclusion: There is a need to increase the utilization of chiropractic services within the general popu-

lation and to expand its role in the health care system. One approach to accomplish both of these is through building multidisciplinary relationships with community clinics, particularly using our educational entities to initiate the building

of such relationships. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Experimental Study to Determine the Development of the Palpatory Capacities of the Third Finger (Major) During Chiropractic Education

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Introduction: The objective of this study was to evaluate the palpatory capacities of the third finger (major) of chiropractic students during the chiropractic training and chiropractors, comparing these groups with a group from the general population.

Methods: Participants were invited to enter a specially prepared room in which only the examiner and participant were present. An experimental apparatus was constructed, whereby the participant was asked to place the third finger of the dominant and then nondominant hand on a stack of papers, underneath which a thin wire had been placed. The participant was asked to determine whether or not the wire could be palpated. The number of pieces of paper was determined at the point at which the participant could palpate the wire. Participants were given the option of opening or closing their eyes during the procedure.

Results: Of the experimental study, 16 participants were from the general population, 80 were chiropractic students, and 16 were chiropractors. The results were treated using variance analysis. Of the chiropractic students, it was noted

that there was a gradual progression of sensitivity of palpation during the course, in both the dominant and nondominant hand. A statistically significant difference was found between the 5th-year students (clinic students) and the chiropractors for the nondominant hand. No statistically significant difference was found between the general population and the 1st-year students. The maximum number of pieces of paper (dominant hand vs nondominant hand) consisted of an average of 12:5.13 for the general population, 19:18 for the students, and 30:31 for the chiropractors. The difference in the number of pieces of paper between the various years of the chiropractic students was found to be statistically significant between the 1st and 5th year (13:11).

Conclusion: The experimental evaluation of the third finger among the general population, the chiropractic students, and the chiropractors demonstrates that there is a gradual acquisition of palpatory sensitivity during the course of study. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Autonomic Response and Determinants of a Hierarchical Order of Feature Integration During Simulated Driving

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Introduction: The present research examined whether a hierarchy of feature integration exists that can differentially influence decision making in motor tasks. The authors manipulated the binding of task-relevant features of a road sign with congruent or incongruent contexts. This was done to examine the saliency of sign features in terms of their influence on performance decisions in a simulated driving task.

Methods: The University ethics committee approved all protocols and informed consent was obtained from participants. Drivers encountered various feature combinations on octagonal signs atop a post at two-way intersections. Separate groups of participants encountered either all red or all green signs throughout the simulated driving task. However, the colored signs were presented with text stating "STOP" or "GO" and were placed in the context of upcoming traffic that was either cluttered or clear. Thus, drivers encountered the traffic signs under varying levels of semantic congruency. A head-mounted eye tracker measured peak pupil diameter, while the simulated driving environment recorded

measures of driving performance as participants ($n = 10$) drove through a course and encountered 16 intersections.

Results: When the text "STOP" was presented, participants had a significant autonomic response (increased pupil dilation) and complied with the appropriate motor response, regardless of the congruency context. In contrast, the text "GO" was only heeded at intersections when there was no oncoming traffic and the octagon color was green.

Discussion: These data support the hypothesis that, in a hierarchical order, changes in combinations of object features affect motor tasks that require decision making.

Conclusion: Changes in textual information are salient enough to evoke changes in the autonomic nervous system. Other features or the context of an object can determine motor response selection, although textual information is primarily dominant. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

A Multimodal Treatment Approach of the Shoulder: A 25-Patient Case Series

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Background: Shoulder pain has the potential to originate from a number of sources located within and distant to the shoulder. The most common source of shoulder pain originates from the rotator cuff, with the most prevalent clinical diagnosis being impingement syndrome (IS). Diagnosis of IS is based on evaluation of a patient's presenting symptoms, physical examination, and supportive imaging findings.

Methods: Twenty-five patients, ages 14 to 78 years (mean 51.08), presented to the primary author's practice. After the initial history and physical examination, a working diagnosis of impingement syndrome was determined. The patients were admitted to a multimodal treatment (MMT) protocol, incorporating short-lever high-velocity manipulation of the cervical or thoracic spines and/or the glenohumeral joint, soft tissue interventions, initial isometric rehabilitation of the rotator cuff and parascapular musculature, and followed by theraband exercises. The outcome measures used in the study included patients' perception of pain (visual analog scale), orthopaedic tests (Neers, Hawkins, painful arc, Jobes full can), orthopedic range of motion, and return to pretreatment

activities. Each patient was treated six to nine times over a 4-week period, with follow-up assessments at 8 and 12 weeks.

Results: All patients at the end of the initial 4-week period demonstrated a clinically significant level of change for pain, orthopedic tests, and range of motion, and were maintained after 8 and 12 weeks. Restoration of full passive and active movements was achieved in 88% (22), with 80% (20) returning to pretreatment activities.

Conclusion: The management of rotator cuff impingement should consider the potential sources of shoulder pain and the function of associated structures, including the scapulothoracic articulations, and cervical and thoracic spines. This study highlights a successful outcome for 25 subjects with shoulder IS after receiving a MMT approach. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Shoulder Impingement: Imaging and Treatment Considerations

Mario Pribicevic, M Chiro, Private Practice, Macquarie University, and **Michelle A. Wessely**, BSc (Chiro), DC, Institut Franco-Europeen de Chiropratique

Introduction: The most commonly cited source of shoulder pain is the rotator cuff tendons, with the most prevalent clinical diagnosis being that of impingement syndrome of the supraspinatus tendon. Diagnosis of impingement syndrome and rotator cuff tendinosis is based on evaluation of patients' presenting symptoms, physical examination, and, if warranted, supportive findings from radiographs, ultrasound, or advanced imaging techniques, such as magnetic resonance (MR imaging) and computed tomography (CT). Accordingly, the authors designed this study to review the clinical management of shoulder pain as described in the literature from a chiropractic perspective, to present the guidelines for diagnostic imaging of the shoulder, and to discuss pertinent radiological findings.

Methods: A review of publications derived from MEDLINE, CINAHL, Ovid, and ScienceDirect databases was done. Included were searches from the Cochrane Musculoskeletal Group Trials Register and Cochrane Controlled Trials Register. Manual searches of textbook and journal bibliographies were utilized with a focus on chiropractic publications, from 1985 to the present.

Results: Seventeen publications utilizing manual therapy were captured, of which 13 were published in chiropractic journals, 2 in physiotherapy journals, and 2 in medical journals. The chiropractic papers presented in this review utilized a multimodal treatment approach with an emphasis on high-velocity manual techniques of the spine and/or glenohumeral joint, soft tissue techniques (massage, muscle energy, active release, and friction), and rehabilitation exercises. The imaging literature emphasized the use of special imaging, particularly MR imaging but also ultrasound, in the determination of the lesion.

Conclusion: The chiropractic literature supports a multimodal treatment approach of shoulder disorders based on low-grade (level 4) case report publications. No quality research has been undertaken within the profession to substantiate a particular approach in the form of a controlled trial. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Effect of Chiropractic Manipulation and Early Functional Training on Lower Extremity Sensorimotor Deficits and Balance: An Observational Study

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Objectives: This observational study assesses the effects of manipulative therapy and lower extremity early functional training on posttraumatic sensorimotor deficits in balance and gait disorder of a patient at a chiropractic college clinic.

Methods: This is a single patient study designed to assess improvement in the patient's quality of life, activities of daily living, neuromuscular function, and balance. Baseline measures included: (1) quad visual analog scale (VAS) for pain, (2) Berg balance scale (BBS), (3) Lower Extremity Disability Index (LEDI), and (4) Short-Form-36 (SF-36) Health Questionnaire. Outcome assessment instruments were scored according to their prescribed scoring algorithms. Scores were compared at baseline and visit 24. Because this is an observational study, precluding formal statistical analysis, change scores were primarily assessed in relationship to their clinical significance. The intervention was usual and customary chiropractic and rehabilitative care delivered by a licensed chiropractic physician.

Results: After 12 weeks of treatment, the patient showed a significant improvement of 23% in the LEDI. The patient

is now able to walk normally on uneven ground/surfaces without the loss of balance and can manage all personal care without symptoms. The BBS improved by 12% after 12 weeks of treatment. The quad VAS indicated that the patient no longer exhibited any musculoskeletal pain and the SF-36 subscale scores also showed improvement after 12 weeks of treatment. In all eight subscales, four approached the norms and four exceeded the norms.

Conclusion: The integrity and control of the sensorimotor system are essential for the maintenance of balance and production of a smooth, stable gait. The combined intervention of high-velocity, low-amplitude spinal and extraspinal manipulative therapy with early functional rehabilitation of the lower extremity was implemented on visits 1 to 24 and showed a favorable response in the patient's overall activities of daily living, quality of life, and neuromuscular function and balance, and produced no adverse effects. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Spinal Radiographic Findings in a Sample of First-Term Chiropractic Students

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Objective: This study surveyed the occurrence of radiographic findings in a sample of first-term chiropractic students. These data were collected as part of an optional service in which students are offered spinal x-rays for clinical and educational purposes.

Methods: Voluntary radiographs were obtained on first-term chiropractic students at Northwestern Health Sciences University (NWSU). Following protocol approval from NWSU's Institutional Review Board, a prospective cohort of all 133 first-trimester chiropractic students was recruited for a larger project focusing on the validity of chiropractic assessments. Of the 133 students, 95 consented to participation in the research and completed the intake interview, radiographs, and data collection. The radiographs included three cervical, two thoracic, and two lumbar views. Radiographs were interpreted by a chiropractic radiologist and radiographic findings were tabulated by a radiology resident.

Results: Seventy-five percent (71/95) of the subjects exhibited at least one radiographic finding, including: 27% (38/71) transitional segment, 19% (27/71) endplate irregularity, 11% (16/71) leg length discrepancy > 1 cm; 11% (8/71) posterior

ponticle, C1; 10% (7/71) spina bifida occulta, C1; 9% (6/71) spina bifida occulta, lumbosacral spine; 9% (8.5) episternal ossicles; and 7% (5/71) degenerative spondylosis. Findings of less than 5% included spondylolysis, spondylolisthesis, platyspondyly, posterior angulation of the dens, and retrolisthesis.

Discussion: While the incidence and prevalence of anatomical variants were very common in this sample of young, relatively healthy adults, their clinical importance remains poorly understood. It has been suggested that the yield of such findings is too low to warrant exposure to radiation, even to symptomatic patients. Our findings provide support that the clinical yield is low, with perhaps the most significant findings being spondylolisthesis/lysis and endplate abnormality. Finally, the high incidence of the residuals of Scheuermann's disease in this sample warrants further study regarding exposure to trauma or activities that increase the stress to the region. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Factors That Affect Students' Attitude Toward Human Anatomy Dissection: A Pilot Study

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Introduction: All chiropractic and medical students go through the process of dissection of human cadavers in their course of gross human anatomy. Previous studies have demonstrated that preconceived concepts of that experience can range from psychological to physical reactions. Ultimately, these reactions may have an effect on students' learning ability. Therefore, the purpose of this pilot study was to identify demographic factors that might affect a chiropractic student's ability to learn human anatomy through the dissection of human specimens.

Methods: A survey of first-term chiropractic students taking anatomy was performed through the use of a questionnaire. The difference between the responses of the students before and after dissection was analyzed for all items except for those that required brief written responses.

Results: When we examined the question regarding "preparedness for human dissection," we found our chiropractic students' results showed that both genders had a more positive response after having taken their first anatomy

course. When we examined the same question with regard to religious beliefs and opposition to dissection, we found a split of opinion among the students' response.

Discussion: This pilot study has demonstrated that factors such as gender, religion, and preparation for the encounter may have a role in determining the student's attitudes toward human specimen dissection. Differences in attitude among the students prior to and after their first-term course in the anatomy lab might help elucidate different teaching techniques that would assist the students with making the experience a successful learning experience.

Conclusion: In conclusion, this preliminary pilot study has identified some factors that may influence students' attitudes toward human cadaver dissection. Gender and religious beliefs have been identified to be two factors that affected these chiropractic students' attitudes toward human dissection. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Relationship Between Senior Chiropractic Students' Scores on an Objective Structured Clinical Examination and Part IV of the National Board of Chiropractic Examiners

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Introduction: Students who wish to become chiropractors and gain licensure to practice in the United States must successfully complete the Doctor of Chiropractic program (DCP) as well as pass either three or four national board exams as administered by the National Board of Chiropractic Examiners (NBCE). In this program, prior to entering their outpatient senior clinical experience, interns must demonstrate that they possess the knowledge, attitudes, and skills necessary to manage simple, moderate, and complex outpatient cases by successfully passing the 11th-quarter Objective Structured Clinical Examination (OSCE).

Methods: This is a retrospective study utilizing past test scores of students enrolled in a DCP. The researcher used a one-shot case study associational (correlational) design, which allows one to observe the relationships that exist between categorical variables (pass or fail OSCE vs pass or fail NBCE) of the type that the researcher is studying.

Results: A significant relationship was established between passing the OSCE and passing Part IV of the NBCE: $\chi^2(1, n = 144) = 4.6, p \leq .05, C = .175$. As can be seen by the contingency coefficient ($C = .175$, significantly less than .71), this relationship was not strong enough to be important.

Discussion: Perhaps this result reflects the number of interns who passed OSCE and failed the NBCE. Because the majority of students who passed the OSCE did go on to pass Part IV NBCE, one could infer this outcome for future students who will sit both exams. The institution will be able to analyze these data and begin to look at the content and criterion validity of the OSCE. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Spinal Palpation for Lumbar Segmental Mobility and Pain Provocation: An Interexaminer Reliability Study

Michael Schneider, DC, Private Practice, University of Pittsburgh, **Richard Erhard**, PT, DC, University of Pittsburgh, **Jennifer Brach**, PT, PhD, University of Pittsburgh, **William Tellin**, DC, Private Practice, **Frank Imbarlina**, DC, Private Practice, and **Anthony Delitto**, PT, PhD, University of Pittsburgh

Study Design: This was an interexaminer reliability study using two experienced clinicians performing three clinical palpation procedures over the lumbar spine and sacroiliac joints: (1) springing palpation for pain provocation, (2) springing palpation for segmental mobility testing, and (3) the prone instability test.

Objectives: The purpose was to determine the degree of interexaminer reliability of these three common manual examination procedures.

Background: The professions of chiropractic, physical therapy, and osteopathy commonly use manual spinal palpation to assess perceived segmental motion dysfunction of the spinal facets and sacroiliac joints and to provoke local pain for diagnostic purposes. The reliability of these physical examination procedures has been controversial.

Methods and Measures: The sample consisted of 39 low back pain patients who had a recent history of low back pain. Inclusion criteria for participation consisted of age between 18 and 65 years, history of low back pain, and the ability

to tolerate lying prone for an examination. Exclusion criteria were history of prior lumbar surgery, stenosis, scoliosis $>20^\circ$ or unstable spondylolisthesis, positive nerve root tension signs or radiculopathy, and any red flags suggestive of spinal pathology. Standard and adjusted kappa values were calculated for each test.

Results: Kappa values for palpation of segmental motion restriction were poor (range, -0.20 to 0.17) and in many cases less than chance observation (negative kappa values). The prone instability test showed reasonable reliability ($\kappa = 0.54$) and palpation for segmental pain provocation also showed reasonable to good reliability ($\kappa = 0.21$ – 0.73).

Conclusion: Palpation methods that are used to provoke pain responses are more reliable than palpation methods in which the clinician purports to find segmental motion restriction. The prone instability test shows good reliability. (*This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.*)

Interexaminer Reliability of the Prone Leg Length Analysis Procedure

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Objective: The purpose of this study was to perform an interexaminer reliability study on the prone leg length analysis procedure.

Methods: Two chiropractors examined 45 patients in the prone position, with the knees in both extended and flexed positions, and with the head rotated right and left. The clinicians determined the side of short leg with knees extended and if a change in leg length occurred with head rotation or when the knees were flexed. They were also asked to visually judge the amount of leg length differential as either $<1/4"$, $1/4$ – $1/2"$, $1/2$ – $3/4"$, or $>3/4"$. The head rotation portion of the test was performed only with patients ($n = 22$) whose leg length differential was determined to be $<1/4"$.

Results: Reliability of determining the side of short leg with knees extended was good (82%, $\kappa = 0.65$), but fair for determining the amount of leg length difference (62%–67% agreement, $\kappa = 0.28$). Reliability of the head rotation testing procedure was poor, with only 50% and 45% agreement with the head rotated left and right, respectively ($\kappa = 0.04$ and

$\kappa = -0.195$). There was no significant correlation between the side of reported pain by the patient and the side of short leg as noted by either clinician ($\chi^2 = 0.55$, $p = .91$ and $\chi^2 = 1.55$, $p = .67$). All of the patients were determined to have a leg length difference by both clinicians, and when the knees were flexed, there was 93% agreement that the short leg became longer (43 of 45 cases) with no reported cases of the short leg getting shorter.

Conclusion: Two clinicians show good reliability on determining the side of short leg in the prone position. The head rotation test for assessing changes in leg length is completely unreliable in this sample of patients. There does not appear to be any correlation between the side of pain noted by the patient and the side of short leg as observed by the clinicians, although all 45 patients in this sample were found to have a short leg by both clinicians. (*This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.*)

Effectiveness of Onsite and Offsite Treatment Management of Workplace Low Back Injuries in Worker's Compensation Claims: A Cohort Study of Clinical and Cost Parameters for the Petrochemical Construction Sector

Murray E. Schneider, DC, MAppSc, Peter Shipka, DC, Private Practice

Introduction: There are few objective clinical data and/or cost/productivity data that directly compare onsite treatment with offsite treatment for similar cohorts. A retrospective offsite cohort and a prospective onsite cohort were examined to compare the clinical effectiveness of onsite treatment with offsite treatment of non-lost-time occupational low back injuries treated under the Worker's Compensation system. Also examined were the cost parameters in regard to treatment costs, case management costs, and lost productivity costs.

Methods: Both cohorts were treated within a pragmatic protocol that included spinal manipulative therapy, electrotherapy, back care education, and a prescribed exercise program. The retrospective cohort was examined for injury care parameters, including number of treatments, number of modified workdays, and days until case closure. This cohort was compared with a prospective cohort, from the same worksite, which examined the same treatment parameters. Cost parameters were examined and compared for both cohorts, including treatment costs, transportation costs, lost productivity measures, and total claim costs. Cost assumptions were made based on accepted industry standards. Visual

analog pain measures were used to determine whether the two cohorts were equivalent at presentation and dismissal. The results of all the outcome measures were compared by *t*-test and analysis of variance for possible differences.

Results: Onsite care resulted in significantly lower injury claim duration ($p < .01$), reduced amount of treatment ($p < .01$), and reduced modified workdays ($p < .01$), as compared with offsite care. There was no difference noted in visual analog pain measures between the two cohorts at intake and dismissal. Onsite care also resulted in significantly lower total claim costs ($p < .01$), treatment costs ($p < .01$), transportation costs ($p < .01$), and lost productivity measures ($p < .01$).

Discussion: This review indicates that an onsite treatment management approach, as compared with an offsite treatment management approach, should be considered for the management of low back injuries in an occupational setting. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Treatment Frequency Response of Spinal Manipulation for Occupational Low Back Injuries: A Prospective Cohort Study

Murray E. Schneider, DC, MAppSc, and Peter Shipka, DC, Private Practice

Introduction: There are few objective clinical data that directly compare different treatment frequencies of spinal manipulation with clinical outcomes in the management of low back pain. The objective of this study was to examine and compare the clinical outcomes and treatment parameters for two different treatment frequency regimes in two prospective cohorts involving non-lost-time occupational low back injuries.

Methods: The two cohorts (cohort A, 4 treatments per week; cohort B, 2 treatments per week) were obtained over sequential time periods from the same site. The sample size of cohort A was $n = 68$, and the sample size of cohort B was $n = 69$. All diagnostic, clinical, and treatment procedures were the same for both cohorts. Both cohorts were treated within a pragmatic protocol that included spinal manipulative therapy, electrotherapy, back care education, and a prescribed exercise program. Both cohorts were examined at intake for demographic factors, previous injury history, and pain severity. Outcome parameters that were examined included the number of treatments, number of modified workdays, days until case closure, and pain severity.

Results: Cohort A (4 treatments per week) resulted in fewer days until case closure (11.3 days vs 18.6 days, $p < .01$) and a fewer number of treatments (5.9 treatments vs 7.1 treatments, $p < .05$), as compared with cohort B (2 treatments per week). The number of modified workdays per claim was not significantly different between the two cohorts. There was no significant difference noted in visual analog pain measures between the two cohorts at intake and dismissal. None of the covariates examined significantly affected the outcomes between the two cohorts.

Discussion: This study indicates that a more frequent treatment management approach, as compared with a less frequent treatment management approach, should be considered when managing low back injuries in an occupational setting with spinal manipulation. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Development and Implementation of a Self-Review Clinical Practice Process by the Alberta College and Association of Chiropractors

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Objective: Due to the growth in the number of chiropractors in Alberta and the geographic distribution of the membership, the Regulatory Department of the Alberta College and Association of Chiropractors (ACAC) determined to revise the current practice review process. The practice review sought to revise the review process from an in-office practice review process toward a self-submission process of practice review. Goals for the process included continuity of the existing process, greater objectivity, decreased volunteer workload, and reduction of backlog of reviews needed to be performed.

Methods: A practice visit matrix was developed as a marking tool that would facilitate development and change as the review process evolved. A pilot self-submission practice visit process was launched on October 1, 2005.

Results: Over the 8 months (October 2005–July 2006) that this document was piloted, 232 reviews were performed. Fifty-six percent of the membership agreed positively that the self-submission practice review covered all aspects of their practices. Thirty-five percent reported the review was

easy to follow and complete. Twenty-nine percent rated that the timelines for completion of the surveys were reasonable, and 25% stated that they wished to continue to be reviewed in this format. The ACAC's approximate backlog of reviews to be performed in October 2005 was 180 with turnaround times of approximately 4 to 6 months. This backlog was cleared by January 2006.

Discussion: The ACAC self-submission practice visit process has been a success from the perspective of the outcome measurements. There is currently no backlog of reviews and the turnaround time for reviews now is 6 to 8 weeks.

Conclusion: The results to date indicate that a self-submission process for practice reviews offers several advantages over onsite practice reviews. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Cobb Angle and Spinal Balance Changes in Adults With Scoliosis

Brian Snyder, DC, and John Zhang, MD, PhD, Logan College of Chiropractic

Introduction: This project is designed to investigate the effectiveness of the Toftness system of chiropractic adjusting on subjects with scoliosis of greater than 10° in Cobb angle measurements after 36 adjustments.

Methods: This project consisted of 25 subjects ($N = 25$) who meet the inclusion criteria. The subject must be at least 18 years of age with either a previously diagnosed and documented scoliosis of 10° Cobb angle or greater with vertebral rotation or a scoliometer measurement of 10° or greater. Anyone without x-ray documentation or those with x-ray documentation greater than 6 months old must consent to having full-spine AP and lateral x-rays taken. Adjustments were administered approximately two to three times per week until 36 visits were completed. A low-force (2–32 oz) technique that incorporates a palpation enhancement device (PED) was used. The adjustment is delivered by the use of a metered, hand-held pressure applicator used at the specified contact site. The adjustment contact line of drive, amount of force applied, and duration of the contact are determined by constant monitoring of the adjustment site with the PED.

Results: Twelve of the 18 subjects had a decrease in Cobb angle, 4 had an increase, and 2 had no change. Fifteen of the 18 subjects showed a decrease in deviation of the odontoid from the sacral vertical line, 2 showed an increase, and 1 had no change. The mean Cobb angle curve reduction was from 18.17° to 15.89° with a mean reduction of 2.28° in the 18 subjects ($p = .037$). It was noted that a measurement of spinal balance, deviation of odontoid from the sacral vertical line, was found to decrease in 15 of the subjects; 2 showed an increase, and 1 showed no change with a mean reduction of 4.0 mm ($p = .0045$).

Conclusion: The Toftness system of chiropractic adjusting showed a statistically significant change in Cobb angles after a series of 36 treatments, and there was a significant change in the spinal balance measurements. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Lateral Spine Distortion Changes in Adults With Full-Spine X-Ray Analysis

Brian Snyder, DC, and John Zhang, MD, PhD, Logan College of Chiropractic

Introduction: This project was designed to investigate the effects of the Toftness system of chiropractic adjusting in adults with lateral spine distortions and changes in overall length of spine and sacral base angle (SBA) changes.

Methods: This project consisted of 25 subjects ($N = 25$) who met the inclusion criteria. The subject must be at least 18 years of age with a documented lateral spine distortion on a lateral full-spine x-ray. Anyone without x-ray documentation or those with x-ray documentation greater than 6 months old must consent to having full-spine lateral x-rays taken. Adjustments were administered approximately two to three times per week until 36 visits were completed. The adjustment time per visit was approximately 5 minutes, with a maximum of 15 minutes. A low-force technique that incorporates a palpation enhancement device (PED) was used. The adjustment contact line of drive, amount of force applied, and duration of the contact are determined by constant monitoring of the adjustment site with the PED.

Results: Twelve of the 18 subjects had an increase in spinal length measurements and 6 had a decrease. Another part of the data analysis involved sacral base angle changes. Four of the 18 subjects had an increase in sacral base angle, 11 had a decrease, and 3 had no change. This measurement was obtained by measuring the angle produced by a line tangent to the sacral base and the lateral edge of the film is known as the sacral base angle.

Conclusion: The Toftness system of chiropractic adjusting showed statistically significant changes in subjects in both the spinal length measurements and the sacral base angle measurements after a series of 36 adjustments. This study suggests that 36 adjustments may be enough to reach significant statistical changes in spinal length and sacral base angles. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Classifying the Pain Patient to Achieve Optimal Clinical Outcomes

Tino Villani, DC, and Steve Delaronde, MPH, MSW, Triad Healthcare, Inc

Introduction: Patient classification systems can be used to guide the practitioner in providing the frequency, intensity, and type of care that is most likely to yield a favorable outcome of reduced pain and improved function. Illness or condition severity is a common approach to patient classification. Data obtained from care plans completed by chiropractors on behalf of their patients and submitted to a third-party medical management organization offer an opportunity to measure baseline patient presentation as well as outcome measures.

Methods: An analysis of 40,267 initial care plans and 17,425 care plan extension requests submitted by chiropractors over a 1-year period was conducted. Patient severity was classified as low, medium, or high, based on initial presentation. Pain, function, and overall improvements were measured at consecutive 30-day intervals for a subset of patients over a 6-month period.

Results: Extended care was requested for nearly one-quarter of the patients after the initial 30 days, with those patients

reporting a 50% overall improvement, a 35% improvement in functional index, and a 30% improvement in numeric pain rating with improvements maintained over the first 180 days. An overall improvement at 30 days was greatest for patients with low severity (61.4%), compared with patients with medium (47.4%) and high (36.7%) severity.

Conclusion: The results of this analysis suggest that care planning can contribute to overall improvements in the pain patient, as well as improvement in comfort and function; however, these improvements vary by patient severity. This classification system may be a better representation of provider expectations than actual patient severity, because patients categorized as high severity counterintuitively require less care than low-severity patients. There is an opportunity in future studies to collect information directly from patients rather than through the provider to validate the classification system. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Effects of Electrical Stimulation of Acupuncture Points on Blood Pressure

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Introduction: The purpose of the study was to investigate the effects of Hans electrical stimulation on acupuncture points on blood pressure.

Methods: Subjects of normal and elevated blood pressure were recruited and randomly assigned into control and experimental groups. Only the experimental subjects received

active Hans electrical stimulation on two acupuncture points for 30 minutes each session, twice a week for 5 weeks.

Results: Twenty-seven subjects (17 males and 10 females) were recruited and completed the study. The average age of the subjects was 25 ± 5 years old (range, 20–36). After using the Hans electrical stimulation on acupuncture points for 5 weeks, the systolic blood pressure decreased significantly in the experimental group with active treatment. The mean systolic blood pressure (mm Hg) was 117.8 ± 4.2 before the treatment and was reduced to 110.8 ± 5.5 ($p < .05$) in the 3rd week and to 110.1 ± 5.8 ($p < .05$) in the 5th week. The mean diastolic blood pressure was 78.1 ± 5.0 before treatment and was reduced to 77.4 ± 4.3 ($p > .05$) in the 3rd week and to 74.8 ± 4.3 ($p > .05$) in the 5th week but both did not reach statistically significant levels. The systolic and

diastolic blood pressure in the control group did not show statistically significant changes. The mean systolic blood pressure (mm Hg) was 115.6 ± 13.3 before the treatment and was reduced to 113.0 ± 12.6 ($p > .05$) in the 3rd week and to 112.2 ± 10.3 ($p > .05$) in the 5th week. The mean diastolic blood pressure was 76.4 ± 7.9 before treatment and was reduced to 76.5 ± 6.9 ($p > .05$) in the 3rd week and to 73.9 ± 5.4 ($p > .05$) in the 5th week.

Conclusion: It was concluded that Hans electrical stimulation of acupuncture points reduced systolic blood pressure but not the diastolic blood pressure in the current subject population with normal and elevated blood pressure. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*

Effects of Custom Foot Orthotics on Balance in the Middle-Aged Population

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Introduction: This experimental study was designed to determine the effect of orthotics on balance in middle-aged normal individuals. This is the first study to use NeuroCom force plates as an outcome assessment instrument in an orthotics study.

Methods: Subjects used Foot Leveler's custom-made orthotics for 3 months to document balance changes using the force plate measures. Subjects were assessed prior to orthotics use and then after 3 months of using the orthotics. The NeuroCom force plate provides objective assessment of the sensory and voluntary motor control of balance with or without visual feedback.

Results: This study recruited 16 (6 females and 10 males) consecutively selected, consenting volunteers with an average age of 51.13 ± 9.9 . Subjects were middle-aged normal asymptomatic residents of a suburban area. The standing on firm surface test with eyes opened improved from

0.262 ± 0.168 to 0.250 ± 0.141 . The standing on firm surface test with eyes closed improved from 0.437 ± 0.354 to 0.412 ± 0.172 . The standing on foam surface test with eyes opened improved from 0.587 ± 0.229 to 0.512 ± 0.195 . The standing on foam surface test with eyes closed improved from 2.700 ± 1.065 to 2.137 ± 0.767 . The overall composite scores on all four tests improved from 0.987 ± 0.339 to 0.850 ± 0.256 . However, all balance tests failed to show statistically significant changes ($p > .05$).

Conclusion: It was concluded that wearing the foot orthotics for 3 months resulted in no significant improvement in subjects' balance in the small sample size pilot study. However, all four tests and the overall composite scores were improved over the study period. Further study with a larger sample size is warranted. *(This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)*