ABSTRACTS OF ACC CONFERENCE PROCEEDINGS

Poster Presentations

Musculoskeletal physical outcome measures in individuals with tension-type headache: a review

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Introduction: Tension-type headache (TTH) is believed to be closely related to the cervical spine and neck muscles' functional assessment related to these muscles. The study objective was to review evidence related to physical and physiological outcomes that have been used in the clinical assessment of TTH patients and to determine whether or not these outcomes are relevant for clinical practice and future TTH research. **Methods:** Searches were performed in Pubmed, MEDLINE, Google Scholar, the Cochrane databases and EMBASE using terms related to the objectives of this study. Selection of articles was made according to specific criteria. **Results:** Forty-four articles were retained. TTH patients showed greater numbers of Trigger Points (TrPs), smaller cross sectional areas (CSAs), lower endurance times, and higher values of electromyography during effort than healthy individuals. Otherwise, conflicting results exist regarding the possible differences in pressure pain threshold, tenderness, muscular strength, and range of motion outcomes. Positive correlations between TTH patients and healthy individuals have been found concerning TrPs, CSAs, and clinical parameters of headache pain. **Conclusion:** This review revealed that physical outcome measures were commonly studied in TTH and that many of these outcomes may be helpful in the discrimination between healthy subjects and TTH patients. (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 use of Patient Reported Outcomes Measurement Information System (PROMIS) to determine the quality of life of pregnant patients presenting for chiropractic care within a practice-based research network

Joel Alcantara, International Chiropractic Pediatric Association

Introduction: The use of the health-related quality of life (HRQoL) measures in chiropractic pregnant patients remains nonexistent. Pregnant patients are characterized showcasing the use of the National Institutes of Health PROMIS program to determine baseline HRQoL measures. **Methods:** In addition to describing sociodemographic and clinical data, patient-centered outcomes measures utilizing the RAND VSQ-9, and the PROMIS-29 Profile V1.0 are demonstrated. **Results:** A convenience sample of 25 subjects (average age = 30.84 years; range of parity = 0–3; average weeks of gestation = 29.5) is described. Motivation for care involved pregnancy-related NMS conditions and "wellness care." The mean RAND VSQ-9 indicated a visit-specific satisfaction rating of "excellent." The PROMIS-29 provided standardized T-scores of: depression (43.66), anxiety/fear (47.49), physical function (44.94), pain interference (54.73), fatigue (54.18), satisfaction with social roles and activities (50.54), and satisfaction with participation in social roles (48.62). **Discussion:** Evidence-informed practice expects that some aspects of chiropractic patients' HRQoL measures will have demonstrable improvements. The use of PROMIS within a chiropractic practice-based research network (PBRN) offers promise in this regard. **Conclusion:** Pregnant patients attending chiropractic care within a PBRN are characterized using PROMIS HRQoL measures. The use of valid outcomes measures to demonstrate chiropractic effectiveness should be further implemented in research and practice. (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 modulation from hemispheric designed chiropractic receptor-based manipulative therapies: a case study

Derek Barton, Life University, David Rosenthal, Private Practice, Benjamin Behrendt, Life University

Background: A 52-year-old patient entered a chiropractic clinic with primary complaints of intermittent low back pain as well as concomitant health issues involving autonomic and auditory systems. **Methods:** Diagnostic pre- and post-findings in conjunction with a thorough functional neurologic chiropractic examination sup-

ported findings for cortical-hemispheric imbalance and autonomic and auditory dysfunctions. Cortical based therapy utilizing chiropractic manipulative therapies (CMTs) was utilized to address imbalances through adjusting metatarsal joints, the ankle mortise, and fibular head articulations. **Results:** After 1st treatment there was resolution of autonomic findings: equalizing blood pressure (decrease of 11 points systolic and 9 points diastolic), heart rate (decrease of 6 bpm), and pupillary light responses. A restoration of auditory function through a return of absent frequencies recorded (audiometric measurements using 25 db at 500 Hz, 1000 Hz, 2000 Hz, and 4000 Hz frequencies) in the right and left auditory systems was also observed. **Conclusion:** Appropriately applied functional neurological CMT can help modulate neural processes helping to regulate autonomic systems. Of importance is how CMT can affect and modulate other organ systems in humans, and, in this case specifically, the restoration of audiometric findings. (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.)

Case-based discussion: enhancing student learners' clinical reasoning through a work-based assessment tool

Victor Benavides, Amy Wright, Texas Chiropractic College

Introduction: The Case-based Discussion (CbD) tool has demonstrated a reliable and valid approach to workplace assessment with respect to clinical reasoning. Three consecutive-entering trimester 7 cohorts in 2011were evaluated with the CbD checklist. **Methods:** The checklists scores and student feedback discussions were reviewed by the instructors to assist in developing topics for focus in the curriculum. **Results:** The results demonstrated increased student involvement in the learning process associated with the chart documentation. Students at various academic levels were engaged. **Discussion:** The process of discussing and giving purposeful feedback to a student regarding a specific patient encounter demonstrated relevance to the learner and the reason why the checklist was important in the student's understanding of clinical reasoning. **Conclusion:** The CbD tool is a beneficial work-based assessment tool that evaluates the student's entries in a patient chart. The CbD also demonstrated the usefulness of the tool to be utilized and engaging to the various levels of the student learners. Further evaluations should be conducted to determine if the CbD has a correlation with the chart audit quality assurance 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.)

A retrospective file review on the possible effectiveness of the advanced orthogonal procedure in the care of patients with headaches

Aaron Bernard, Advanced Orthogonal Chiropractic, Joel Alcantara, Life Chiropractic College West, George Stanford Pierce, Advanced Orthogonal Chiropractic, George Stanford Pierce Jr., Advanced Orthogonal Chiropractic

Introduction: Globally, headache disorders are among the 10 most disabling disorders. To contribute to evidence-informed practice, we performed a retrospective file review of patients receiving advanced orthogonal technique spinal manipulative therapy (SMT) with a chief complaint of headaches. **Methods:** Inclusion criteria for file review were patients completing a diagnostic work up, receiving a trial of chiropractic care, and completing baseline and comparative questionnaires using the Headache Impact Test-6 (HIT-6), Quadruple Visual Analog Scale (QVAS), and RAND SF-36. **Results:** Sixteen patients (11 females; 5 males; average age = 42.5 years) comprised the cohort with chronic complaints of migraine (n = 7), cervicogenic (n = 5), and chronic tension (n = 4) headaches. Following a trial of chiropractic care, the patients' headache symptoms improved as measured on the QVAS, HIT-6, and RAND SF-36 questionnaires. The measured changes were statistically significant as measured by a paired *t* test. To date, this is the first publication utilizing the combination of HIT-6, QVAS, and RAND SF-36 questionnaires as outcome measures in patients with headaches. **Conclusion:** Our file review demonstrated the possible effectiveness of advanced orthogonal technique SMT. We encourage further research with this mode of chiropractic care in patients with headaches in prospective or randomized clinical trials. (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 retrospective file review of the possible effectiveness of the advanced orthogonal procedure in the care of patients with low back pain

Aaron Bernard, Advanced Orthogonal Chiropractic, Joel Alcantara, Life Chiropractic College West, George Stanford Pierce, Advanced Orthogonal Chiropractic, George Stanford Pierce Jr., Advanced Orthogonal Chiropractic

Introduction: No "gold standard" treatment exists despite the burden of low back pain (LBP). In the interest of evidence-informed practice, we performed a retrospective file review of patients receiving advanced orthogonal technique spinal manipulative therapy (SMT) with a chief complaint of LBP. **Methods:** Inclusion criteria for file review were patients completing a diagnostic work up, receiving a trial of chiropractic care, and completing baseline and comparative questionnaires using the Revised Oswestry LBP questionnaire (RODQ), the Quadruple Visual Analog Scale (QVAS), and the RAND SF-36. **Results:** Twenty-one files satisfied our inclusion criteria for review. There were 12 females and 9 males with an average age at 50.76 years. Following a trial of chiropractic care, the patients' LBP symptoms improved as measured on the RODQ, the QVAS, and RAND SF-36 questionnaires.

The measured changes were statistically significant as measured by a paired *T*-test. **Discussion:** To date, this is the 1st publication utilizing patient-centered outcome measures to observe the effectiveness of the advanced orthogonal technique in the care of patients with LBP in clinical practice. **Conclusion:** Our file review demonstrated the possible effectiveness of advanced orthogonal technique SMT. We encourage further research with this mode of chiropractic care in patients with LBP in prospective or randomized clinical trials. (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 and dentistry- the need for mutual understanding of temporomandibular joint co-treatment: a case report

Charles Blum, Sacro Occipital Technique Organization, Rebecca Griffiths

Introduction: A 19-year-old male presented with a history of attempting a back flip on a trampoline but landed on his head and compressed his neck. While taking the case history, his parent noted that he also had persistent and intense bruxism at night creating significant sounds that would waken others near his room at night. **Methods/Intervention:** Evaluation revealed decreased cervical range of motion, category II sacroiliac joint sprain and significant temporomandibular joint **(**TMJ) related findings, relating to a dental class III (protruded) occlusion and concurrent class II (retruded) condylar position. He was treated with sacro occipital technique (SOT) category II block placement, cervical stairstep adjusting, and SOT cranial/TMJ related care. **Results:** The cervical spine range of motion and pain improved immediately following the treatment. However, the dental presentation suggested a referral to a dentist familiar with functional orthodontics and trained within a dental chiropractic co-treatment methodology. **Conclusion:** The purpose of this case report was to illustrate a working treatment program where both chiropractic and dentistry played an integral part in an attempt to improve patient care and outcomes. Further research is needed to investigate the subset of patients needing chiropractic and dental collaborative care for optimal outcomes. (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 comprehensive learning series on yellow flags for the DC and DC student

Teresa Brennan, Palmer College of Chiropractic

Objective: Yellow flags have been defined as the psychosocial factors likely to lead to chronicity of or to disability related to a physical condition. It is necessary to include in our chiropractic education, training that identifies and quantifies effective provider responses to yellow flags for best practices. **Methods:** A series of learning modules on yellow flags was designed, which was both implemented in the ninth quarter at a chiropractic college and taught to clinic faculty. The modules consisted of the identification and quantification of yellow flags, seven yellow flags and outcome assessment tools, evidenced-based intervention and responses techniques, seven interventions, i.e., desensitization, a yellow flag management algorithm, responses, assessments, redirects navigating mental health care team-based learning application exercise, and simulated patient case scenario. **Discussion:** Clinical mentors anecdotally reported an increase in the psychologic acumen of interns who were taught this series. Experienced doctors of chiropractic (clinic faculty) were able to, after a single exposure to this series, complete the application exercise. (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.)

Medicare beneficiary double lumbar spinal surgical intervention cost comparison with positive outcome measures using a chiropractic manual medicine management approach

Thomas Brodar, Brodar Chiropractic Office, Eric Gren, Clinical Research Associate

A case study of the relative cost of 2 traditional and accepted surgical low back procedures for spinal care on a Medicare beneficiary and a chiropractic spinal case management approach using a conservative biomechanical analytical approach into the pelvic girdle following the natural fault lines of the sacroiliac articulations and administering specfic chiropractic manual adjustments for the reduction of a pelvic subluxation. (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 use of chiropractic manipulation in the post-surgical spine

Christopher M. Coulis, Anthony J. Lisi

Objective: To describe the use of spinal manipulation, including high velocity low amplitude (HVLA) manipulation and flexion-distraction mobilization, in 3 cases of post-surgical spine pain treated at a major US medical center. **Clinical Features:** Three patients with post-surgical spine pain (1 cervical fusion, 1 lumbar discectomy, and 1 lumbar laminectomy) presented for chiropractic treatment. Treatment included spinal manipulation and flexion distraction mobilization based on patient response to joint loading strategies. **Intervention and Outcome:** 2 patients were treated with HVLA spinal manipulation. One patient was treated with flexion distraction mobilization as he demonstrated peripheralization during side-posture HVLA set up. Subjective improvement was noted in NRS scores and functional changes and, in each trial, the patients reported being "satisfied" with their overall outcome. One episode of transient benign soreness was noted

lasting 24 hours. No major irreversible complications were seen in any patient. **Conclusion:** The post-surgical spine presents a relative contraindication to spinal manipulation. However, in these cases spinal manipulation/mobilization was safe and may have been effective. This, along with the existing literature, supports the need for prospective studies of larger patient cohorts. (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.)

Changes in symptomatological intensity in women with primary dysmenorrhea after chiropractic spinal manipulation treatment

Fábio Dal Bello, Universidad Santo Tomás, Ricardo Fujikawa, Real Centro Universitario Maria Cristina, Ricardo Souza de Carvalho, Universidad Santo Tomás

Introduction: Dysmenorrhea is the most common gynecologic problem in women in the menstrual period. The objective of this study was to evaluate changes in symptomatologic intensity caused by primary dysmenorrhea after chiropractic treatment. **Methods:** Thirty women were enrolled in the study in which 15 were directed to the experimental group and 15 to the control group. The experiment group patients were submitted to chiropractic adjustments and the control group patients had their information collected but did not receive any treatment. The pain values obtained in the 1st month were compared to ones obtained in the 2nd month in each group separately. **Results**: The 15 women of the experimental group presented an improvement of 65% comparing the data collected in 2 months before they had their menstrual period ($p = 0.01$); and 76% comparing the values collected in the second day of the menstrual flow of each month ($p = 0.00002$). Patients in the control group in either month demonstrated similar values in all the data collection. **Discussion and Conclusion:** In patients with primary dysmenorrhea the introduction of chiropractic adjustments as indicated might be beneficial and should be considered as a therapeutical approach in these cases. (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.)

Congenital spinal anomalies: a comparative study

Eva Elsangak, Life University, Kathleen Linaker, D'Youville College

A retrospective study was designed to identify the occurrence of spinal congenital anomalies in the male and female populations. 3,561 consecutive radiology reports interpreted by board-certified chiropractic radiologists and tabulated them according to patient gender, area of spine viewed, and congenital spinal anomaly identified. A total of 6497 views were performed on 3561 patients (1885 male and 1676 female). Congenital spinal anomalies were seen in 1346 patients, 723 males and 623 females. This study of a symptomatic, large cross-cultural, cross-gender, cross-generation population revealed a significant number of congenital spinal anomalies ranging from those not significant to chiropractic procedures to those that render osseous adjustments risky and potentially harmful. This review provided some statistical background to those on both sides of the debate regarding the risks of radiation exposure vs the risks of spinal manipulation without prior x-ray evaluation of the underlying structures. Absolute and relative contraindications must be considered when applying a chiropractic technique. (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 use of vestibular rehabilitation therapies in traumatic brain injury to improve balance, station, and gait

Susan Esposito, Life University, Linda Mullin, Life University, Frederick Carrick, Carrick Institute

Background: We describe a case of a 39-year-old male who presented to a university-based functional neurology clinic for impaired balance following a traumatic brain injury. After 4 years of neuropsychiatric and neurobehavioral treatment, he remained completely disabled with symptoms of persistent and severe balance issues, anxiety, depression, decreased concentration, short- and long-term memory loss, and difficulty following spoken directions, as well as debilitating physical complaints. **Methods:** Diagnostic inventories of brain function revealed a frontal lobe syndrome with a central vestibular axis and a postural instability confirmed by computerized dynamic posturography. The patient underwent a 10-week program of vestibular rehabilitation strategies including frontal eye movements and multi-axis labyrinthine and otolithic stimulation. **Results:** Stability of balance, station, and gait was restored as confirmed by computerized dynamic posturogaphy. Significant improvement in cognitive abilities, a reduction in anxiety and stability of mood along with increased energy, and clarity of thought and memory were found. There was also a progressive return of normal speech patterns. Processing speed and executive functions were observed to be appropriate. The number and severity of physical complaints decreased and he was able to perform activities of daily living and resume regular social activities. (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.)

Sitting disc technique and the relationship to the straight leg raise: a retrospective case series of 30 patients

Harvey Getzoff

Introduction: The purpose of this study was to determine if a chiropractic intervention, the sitting disc

technique (SDT), could be used in coordination with a common orthopedic/neurologic test, the straight leg raise (SLR). **Case Series:** A retrospective study of 30 sequential patients treated at 1 practitioner's office who, following assessment and evaluation, were determined to have a positive SLR bilaterally, were adjusted with the SDT, and then reassessed utilizing the SLR (measured with a flexometer). To qualify for the study all 30 patients had to have similar SLR findings on both leg lifts, pain in the lumbosacral area with some pelvic area pain, unilateral lower extremity pain but not below the knee, and pain localizing to the leg contralateral to their antalgic lean. **Results:** Improvement immediately followed care in 27 of 30 cases with the least improvement by 4 patients at 5°and the maximum at 35° by 1 patient with the majority showing improvement between 10–25°. **Conclusion:** The SLR appeared to be a helpful method to monitor the functional improvement of the lumbar spine after successful SDT adjustments. The SLR also appeared to parallel positive symptomatic changes that accompanied lumbar spine improvement following the SDT applications. (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.)

Identification of suspicious skin lesions in chiropractic practice: a cross sectional study

Sara Glithro, David Newell, Adrian Hunnisett, Christina Cunliffe, McTimoney College of Chiropractic

Introduction: Education and early detection are recommended to arrest the increasing incidence of skin cancer in the UK. Chiropractors are ideally placed to play a part in these programs. This study aimed to gather information on the incidence, detection, and referral patterns of suspicious skin lesions. **Methods:** Following ethical approval, a cross-sectional study was used to gather data on the accuracy of detecting suspicious skin lesions from clinical images and subsequent referral patterns amongst a sample of UK final-year chiropractic interns and registered chiropractors. The study also identified any further training needs. **Results:** A total of 125 surveys was collected and the majority (78%) agreed that screening for suspicious skin lesions was part of their role. On identification of lesions, 75% labeled malignant melanoma and squamous cell carcinoma as suspicious, <45% did so for basal cell carcinoma and actinic keratosis. While 74% had received some related training, 78% would be interested in receiving more. **Conclusion:** Overall, all groups agreed that screening patients for suspicious skin lesions was part of their role. There was no difference between interns and chiropractors identifying suspicious skin lesions. The level of knowledge in identifying suspicious lesions was low, identifying a training need. (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.)

Avulsion fracture of the iliac crest apophysis in a 15-year-old football player

Stephen Grand, Matthew Richardson, Palmer College of Chiropractic

Introduction: This is a diagnosis that is considered rare in the literature and that we feel we were able to co-manage successfully, but which presented some pitfalls. **Methods:** The patient was treated and co-managed conservatively by chiropractic and orthopedic physicians in independent offices. Multiple imaging was obtained, verifying the diagnosis, and follow up was obtained later to vouch for the outcomes. **Results:** The patient's initial presentation was of a person in significant pain with antalgia and dysfunction due to a football injury. The imaging, computerized tomographic and radiographic, demonstrated apophyseal disruptions suggestive of a Salter-Harris type fracture. He was treated with laser therapy to the injured area and manipulation to other areas as indicated. He was also told to use crutches initially and not to participate until we re-evaluated and released him for such activity. **Conclusion:** Avulsion fractures, including those affecting the iliac crest may not be as rare as reported earlier. They could have significant consequences for young people if not properly diagnosed and treated. They should be evaluated by appropriate imaging, even in those who undergo minor trauma. (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.)

Evaluation of transcutaneous electrical nerve stimulation vs biofreeze in the treatment of back pain

Jay Greenstein, Sport and Spine Rehab Clinical Research Foundation, Barton Bishop, Sport and Spine Rehab Clinical Research Foundation, Jena Etnoyer, Sport and Spine Rehab Clinical Research Foundation, Robert Topp, Marquette University

Introduction: One theory to explain how transcutaneous electrical nerve stimulation (TENS) decreases pain is the gate control theory, suggesting a gate mechanism is closed in the spinal cord, preventing pain-carrying messages from reaching the brain. Biofreeze (BF), a topical analgesic, is also thought to decrease pain by the gate control theory. **Methods:** The purpose was to evaluate the effect of BF on pain, fear avoidance, and disability in back pain compared to TENS. Participants were randomized into Funhab TENS or Funhab BF. Each group received Funhab plus treatment; TENS applied treatment 1 time per day for 15 minutes while BF applied treatment 3 times per day. Outcome measures included the visual analogue scale (VAS), Oswestry disability index (ODI), fear avoidance beliefs questionnaire physical activity subscale (FABQpa), and fear avoidance beliefs questionnaire work subscale (FABQW) pre- and post-study. **Results:** Twenty-two subjects completed the study (BF = 6, TENS = 16). The TENS group significantly declined in ODI and FABQ-PA scores ($p \leq 0.001$ and $p = 0.001$, respectively). The

BF group had significantly decreased FABQW scores ($p = 0.044$). Finally, both groups had significant declines in VAS ($p \leq 0.001$). Cost of BF was $15 per patient and TENS was $75 per patient. **Conclusion:** BF and TENS had statistically similar outcomes for pain, disability, and fear avoidance. Given the cost savings of BF, it would be a prudent choice to incorporate BF as a replacement for TENS. (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.)

Association between heart rate variability and novel pulse rate variability methods

John Hart

Introduction: A neurologic component, which includes an autonomic component, is assumed to exist in the condition known as vertebral subluxation (VS). High-tech methods of autonomic assessment (e.g., heart rate variability) are typically used only periodically (e.g., every 6 or 12 visits). As an additional option for autonomic assessment at all patient visits, this study introduced a new and potentially valid method of autonomic assessment that uses radial pulse variability. **Methods:** The study was approved by the Sherman College institutional review board. Thirty-two participants were examined with (1) regular heart rate variability (using the standard deviation of normal to normal [SDNN] value) and (2) novel pulse rate variability procedures. The novel methods are based on 4 manually palpated radial pulse measurements taken within a 2-minute period. **Results:** Two predictors emerged as having the strongest association with SDNN in this study: pulse rate mean and (novel) pulse rate mean minus the difference between maximum and minimum pulse rates. **Conclusion:** Chiropractors may have a new option for assessing autonomic function on every patient visit in the form of low-tech radial pulse rate variability. Further outcomes research with a random sample of patients is indicated as a next step in this 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.)

Is collaborative practice a feature of chiropractic education: a baseline survey

Navine Haworth, Barry Draper, RMIT University

Introduction and Background: Collaborative practice is considered best practice in terms of the benefits to patients, practitioners, optimizing health services, strengthening the health system, and improving health outcomes. Mainstream medical and allied health industries are implementing collaborative practice into their education programs by ways of interprofessional education (IPE) and interprofessional learning. **Objective:** The aim of this study is to investigate incidence of IPE/collaborative practice in chiropractic education programs. **Methods:** Investigate use of collaborative practice in chiropractic clinical education through published literature and open web search utilizing key terms by method of content analysis. **Results:** Evidence suggests some chiropractic institutions are engaging in collaborative practice. More institutions make use of terms indicating this practice on their publicly accessible web sites compared to that found in the literature. North American institutions were more frequently represented. **Conclusion:** This paper describes the results of a baseline investigation into the extent of collaborative learning present in chiropractic education programs. The findings indicated a low level of engagement, and the possible explanations to account for this were raised. (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.)

Prevalence of non-musculoskeletal vs musculoskeletal cases in a chiropractic student clinic

Bruce Hodges, Jerrilyn Cambron, Rachel Klein, Dana Madigan, National University of Health Sciences

Purpose: This study sought to identify the percentage of non-musculoskeletal and musculoskeletal conditions treated by interns in the National University of Health Sciences (NUHS) Student Clinic compared to chiropractic and allopathic health care professionals to help evaluate if NUHS student interns were being trained as primary care physicians. **Methods:** The information gathered was taken from the charts of patients treated from September 12, 2011 through December 9, 2011. The data included ICD codes for the conditions treated, the number of patient visits, patient age, and patient gender. **Results:** Of the 113 eligible patients 56% were women, the mean patient age was 28 years, they had an average of 3 treated diagnoses, and they had a mean of 7 treatments. Those treated for only musculoskeletal conditions totaled 52% of the patients; 48% of the patients were treated for non-musculoskeletal conditions or both musculoskeletal and non-musculoskeletal conditions. **Conclusion:** The NUHS Student Clinic interns were treating a greater percentage of non-musculoskeletal conditions and a lesser percentage of musculoskeletal conditions than practicing chiropractic physicians. The student interns treated a lesser percentage of non-musculoskeletal and a greater percentage of musculoskeletal than allopathic practitioners. This comparison suggests that NUHS is nearing its institutional goal of training student interns as primary care physicians. (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.)

Case report: a patient with low back pain and somatic referred pain concomitant with intermittent claudication in a chiropractic practice

Kathryn Hoiriis, Brent Russell, Life University

Introduction: Approximately 12% of older patients in the general population have atherosclerotic disease of the aorta and lower extremity arteries, i.e., peripheral artery disease (PAD). Intermittent claudication is the most common symptom. When a patient with low back pain complains of lower extremity pain that is worsened with mild exercise (e.g., walking), the etiology is often not clear. **Case Report:** This report describes a 56-year-old man with a history of low back and leg injury and pain, with a recent complaint of left leg weakness. X-ray findings included degeneration at several levels of the lumbar spine, abdominal aorta, and common iliac arterial calcification. The patient was instructed to return to his internist, and subsequently stents were inserted into his left external iliac artery. **Discussion:** Claudication may go undiagnosed because many people consider the pain a consequence of aging and may, therefore, just reduce their activity level to avoid the pain. Early diagnosis of PAD/intermittent claudication is important since PAD is a major risk factor for adverse cardiovascular events. **Conclusion:** Appropriate patient management in the chiropractic clinical setting requires an awareness of the high occurrence of PAD in the general population. (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.)

Defining and measuring quality in chiropractic health care: toward Six Sigma success

Nicole Homb, Shayan Sheybani, Palmer College of Chiropractic

Introduction: In light of the recently enacted Patient Protection and Affordable Care Act, increased efforts to reduce costs and improve quality of health care have put a renewed emphasis on measuring quality of care. The aim of this study was to report common definitions of quality and discuss the use of process and outcome indicators in the context of chiropractic health care quality assessment. **Methods:** A literature review of published peer-reviewed English-language articles indexed in PubMed and Index to Chiropractic Literature using the following search terms: process assessment, outcome assessment, and quality assessment. **Results:** Currently, there is an increased effort to develop rigorous measures of performance in the assessment of health care quality. Valid and reliable performance indicators specific and relevant to the practice of chiropractic are lacking, however. **Discussion/Conclusion:** Performance indicators as valid measures in the assessment of health care quality for musculoskeletal conditions are scarce within the published literature. Rigorous studies of the relationship between process and outcome of care will aid in developing chiropractic standards of care for managing musculoskeletal symptoms. Such efforts will permit the implementation of process-oriented improvement strategies, like Six Sigma, to measure and enhance the efficiency and quality of 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.)

Diagnosis and serial sonography of a proximal fifth metatarsal stress fracture

Martha Kaeser, Patrick Battaglia, Norman Kettner, Logan College of Chiropractic

Objective: Seventy percent of metatarsal fractures involve the 5th metatarsal. Diaphyseal stress fractures represent less than 10% of all metatarsal stress fractures; however, they have the least favorable prognosis. **Discussion:** A 68-year-old female presented to a chiropractic teaching clinic for evaluation of right foot pain. Sonographic examination with an ultrasound (US) scanner (LOGIQ E9, GE Healthcare, Milwaukee, WI) using an 8–15 MHz linear array transducer showed increased vascularity, periosteal elevation, and cortical disruption of the proximal diaphysis of the 5th metatarsal, which was suggestive of a stress fracture. **Results:** The patient was co-managed with an orthopedist. Computed tomographic (CT) examination confirmed a fracture of the proximal diaphysis of the 5th metatarsal. We utilized CT–US fusion technology to further confirm the sonographic findings. Serial sonographic images were obtained to document fracture healing and exclude complications. **Conclusion:** We reported a case of a proximal 5th metatarsal stress fracture that was visualized with US, confirmed with CT–US fusion technology, and followed through symptom resolution by serial examinations. Sonography is a cost-effective means to aid clinicians in early detection of metatarsal stress injury, which is essential to optimal nonsurgical outcomes and prognosis. (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.)

Thyroid carcinoma: incidental finding while assessing cervical lymphadenopathy

Martha Kaeser, Jinpu Li, Norman Kettner, Logan College of Chiropractic/University Programs

Objective: Thyroid nodules may be an incidental finding on a cervical spine examination. Thyroid malignancies are detected in 5–15% of these nodules with papillary thyroid carcinoma being the most common histological subtype. **Discussion:** A 35-year-old Chinese American male presented to a chiropractic teaching clinic for evaluation of suspected anterior cervical lymphadenopathy. A sonographic examination was ordered. During examination of the anterior neck with an ultrasound scanner (LOGIQ E9, GE Healthcare, Milwaukee, WI) using an 8–13 MHz linear array transducer, adenopathy was confirmed and a nodule was detected in the right lobe of the thyroid gland. **Results:** Following a dedicated sonographic thyroid examination a solid, heterogeneous nodule measuring 1.56 cm x 1.06 cm x 0.93 cm was noted in the superior aspect of the right lobe with punctuate calcifications. An endocrinologist performed a fine-needle biopsy revealing papillary

thyroid carcinoma without metastatic lymphadenopathy. Treatment with total thyroidectomy and low-dose radioiodine ablation was initiated. **Conclusion:** We presented a case of thyroid papillary carcinoma discovered incidentally during sonographic evaluation for cervical lymphadenopathy. Early detection of thyroid papillary carcinoma resulted in a favorable prognosis. (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.)

Proximal tibiofibular ganglion cyst in a recreational runner : a case report

Ismat Kanga, Paula Stern, Dominic Giuliano, Canadian Memorial Chiropractic College

Introduction: Ganglion cysts of the proximal tibiofibular joint are uncommon. The following case report highlighted a proximal tibiofibular joint ganglion cyst and aimed to educate chiropractors on its prevalence, etiology, and clinical presentation to allow for diagnosis and appropriate management. **Clinical Features:** A 47-year-old male recreational runner presented with a 2-month history of left posterior and lateral knee pain following a 4-kilometer run. **Results:** An 8-mm ganglion cyst was found with moderate chrondromalacia patella. **Conclusion:** The diagnosis of these cysts can be challenging due to the lack of pathognomonic tests and the variability in presentation. Patients frequently report fullness behind the knee, lateral knee pain, and motor weakness resulting in a foot drop. Conservative therapy including aspiration and steroid injections are preferred when the cysts are asymptomatic. Surgical resections are performed when patients experience neurologic symptoms or recurrent cysts. Ganglion cyst should always be considered when patients present with fullness, vague lateral knee pain, and neurologic deficits. (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.)

Resolution of hearing loss after chiropractic manipulation

Kimberly Keene, Melissa Ferranti, Chelsea Prothero, Palmer College of Chiropractic

Introduction: While chiropractic care is often associated with the treatment of musculoskeletal conditions, there are other nonmusculoskeletal conditions that may benefit from spinal manipulation. This paper reported on the return of hearing in a woman treated with chiropractic adjustment. **Clinical Features:** In this report, a woman with neck pain, tinnitus, and hearing loss was treated with cervical spinal manipulation with positive results. A pretreatment audiogram indicated low-frequency hearing loss that was worse in the left ear. Following treatment the audiogram was normal. **Intervention and Outcome:** After being unsuccessfully medically treated over an 8-month period, the woman sought chiropractic care for the above symptoms. After 3 chiropractic adjustments her hearing and associated symptoms were significantly improved. She received 12 treatments over a 4-month period. When asked to rate her hearing and fullness sensation in the ear on a 0–10 scale, where 0 is no deficit and 10 is completely impaired, she initially rated her symptoms as 7, and 5 months after the conclusion of care her rating dropped to 1. **Conclusion:** This report detailed the condition and treatment of a female patient with cervicalgia and associated hearing loss. Possible mechanisms for these results are discussed. (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 Khmer translation and cross-cultural adaptation of the Patient-Reported Outcome Measurement Information System global health survey

Kim Khauv, Life Chiropractic College West, Maliny Taing

Introduction: Quality of life (QOL) studies in Cambodia have been limited to HIV/AIDS patients, caretakers, and those living with disabilities. The Patient-Reported Outcome Measurement Information System (PROMIS) instruments, including the 10-item global health survey, were developed, validated, and standardized in the English language during a 5-year initiative funded by the National Institutes of Health. In order to evaluate global health changes in Cambodians, during a chiropractic mission trip to Cambodia the instrument was translated into the Khmer language and culturally adapted. **Methods:** The Guillemin process has been used in many translations and cross-cultural adaptations of health-related questionnaires into a variety of different languages. Guillemin describes the process in several stages: stage 1, initial translation; stage 2, synthesis of these translations; stage 3, back translation; stage 4, expert committee; and stage 5, test of the pre-final version. The principal investigator hired a project manager living in Phnom Penh, Cambodia. The project manager then hired the translators and expert committee members and coordinated every stage of Guillemin's process. **Results:** This is the first Khmer translation of the PROMIS global health survey. **Discussion:** RA reliability and validity study of this Khmer translated instrument is under way in Cambodia. **Conclusion:** The translation and cultural adaption process was successful. (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.)

Coiling and kinking of internal carotid arteries in upper cervical area: a case report

Pil-Woo Kim, Kathryn Hoiriis, Life University

Introduction: The upper cervical area is quite complicated anatomically. The internal carotid artery (ICA) is one of the structures of high importance in cervical area. Most of time the ICA runs straight to the carotid

canal. **Findings:** Two cadaver case studies demonstrate coiling and kinking patterns of ICA at the level of C1 and C2–3. ICA runs anterior to C1 transverse process (TP), posterior to pharyngeal wall, and medial to the vagus and glosspharyngeal nerve in the carotid sheath. The external carotid artery runs between stylohyoid muscle and styloglossus muscle. The ICA goes under stylophrayngeal muscle in upper cervical area. **Discussion:** Coiling and kinking patterns represent congenital vascular anomalies, arteriosclerotic pathology, or fibromuscular dysplasia and has some relevance to cerebrovascular disease. There may also be greater disturbance in the flow of the blood to the brain, and/or occurrence of ectasia and aneurismal dilation in the carotid siphon. The ICA is located in close proximity such that it almost contacts with the TP of the vertebrae, so the adjustment will possibly affect the vessel. This relationship may explain some patients having symptoms of dizziness or fainting after upper cervical adjustment. (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.)

Integrative complementary and alternative medical care for low back pain: a systematic review

Anupama Kizhakkeveettil, Kevin Rose, Gena Kadar, Southern California University of Health Sciences

Introduction: Low back pain (LBP) is one of the most significant health care challenges affecting modern society. There is little consensus among health care practitioners as to the most appropriate management for LBP. The objective of this systematic review was to determine the effectiveness of an integrated approach, which included complementary and alternative medicine (CAM) therapies and conventional medicine for the management of LBP. **Methods:** A literature search was conducted to find randomized controlled trials (RCTs) on the use of integrated therapy with CAM modalities for LBP. The Van Tulder scale was used for rating the quality of the studies found. **Results:** Twenty articles were found that met the inclusion criteria, 16 of which were found to be of high quality. There was consensus for the effectiveness of chiropractic combined with exercise, and acupuncture combined with physiotherapy, and acupuncture combined with conventional medicine. **Discussion:** Absent a definitive effective method for treating LBP, clinicians should consider using an integrated approach that combines CAM modalities and conventional medicine. There is a lack of RCTs for many CAM modalities used in an integrated fashion. **Conclusion:** There is some evidence for treating LBP with integrated treatments that include CAM modalities. Results showed the need for further research. (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.)

Attitudes towards vaccination: a follow-up survey of students at the Canadian Memorial Chiropractic College

Marlee Lameris, Catherine Schmidt, Brian Gleberzon, Jillian Ogrady, Canadian Memorial Chiropractic College

Introduction: The purpose of this study was to conduct an online survey of chiropractic students in the 2011–2012 academic year at the Canadian Memorial Chiropractic College (CMCC) in order to determine their attitudes toward vaccination, their history of vaccination, and their opinions toward their level of preparedness and confidence to discuss vaccination with patients. Responses were compared to a similar survey conducted a decade ago. **Methods:** All students enrolled in the program at CMCC were eligible to participate in this anonymous survey modeled after a similar survey administered in 1999–2000. **Results:** The response rate was 43%. Over 90% of all students reported they had been vaccinated. Approximately one-half of students felt they were well prepared to discuss vaccination with their patients and two-thirds felt they were confident to do so. Between 83.9% and 90% of students in various years of the program expressed a positive attitude towards vaccination. **Discussion:** A separate Welsh *t* test for each year of study indicated a statistically significant difference between the 2 surveys, with students in our study expressing a more positive attitude towards vaccination. **Conclusion:** Compared to a decade ago, students in the current program at CMCC expressed a much more positive decade towards vaccination. (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 rare case of a large dermoid cyst and staghorn calculi

Melissa Loschiavo, Marni Capes, R. Bruce Fox, Life University

Objective: To present an educational, retrospective case report of a chiropractic patient with a dermoid cyst and staghorn calculi. **Clinical features and outcome:** A 58-year-old female presented with low back pain following a motor vehicle crash. She reported discomfort in her abdomen when lying prone. Conventional x-rays of the lumbar spine revealed a large, well-defined dermoid cyst measuring 14.2 cm and staghorn calculi. The patient was referred for an allopathic consultation. **Conclusion:** A dermoid cyst, also known as a benign germ cell tumor, is the most common ovarian neoplasm. The major components include ectodermal tissues such as teeth, hair, and sebaceous material. Less than 2% undergo malignant transformation. Torsion is a complication as the lesion grows, ultimately leading to pain, rupture, and infection of surrounding tissues. Staghorn calculi represent struvite stones commonly associated with recurrent urinary tract infection. Surgical excision of the cyst and calculi must be considered to avoid renal failure. Health care providers need to be aware of the clinical and x-ray findings as well as the management protocol for dermoid cysts and potentially associated

staghorn calculi. (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 use of social media among a random sample of Ontario chiropractors

Stephen Malone, Brian Gleberzon, Marc Cerulli, Thomas Osmond, Canadian Memorial Chiropractic College

Introduction: The purpose of this study was to survey Ontario chiropractors in order to ascertain their use of and attitudes towards social networking media (SNM). **Methods:** A random sample of chiropractors from Ontario was surveyed in order to identify which, and for what purposes, 6 of the more popular SNM platforms were used. **Results:** One-hundred of 75 chiropractors completed our survey. The SNM used and percentage of respondents who used them were**:** Facebook (61.5%), Twitter (23.1%), LinkedIn (51%), web sites (70.3%), blogs (17%), and Groupons (3.8%). Respondents reported they most commonly used SNM to provide health care information to their patients, advertise their services, and provide links to other health care information. Most respondents were in favor of licensing bodies regulating the use of SNM. **Discussion:** Medical advocacy groups have developed guidelines for members to avoid the dangers of boundary crossing, and chiropractic licensing bodies are struggling with this area of communication as well. **Conclusion:** Despite the concerns of possible boundary crossing between doctors and patients, most respondents in our survey reported using a number of different SNM for professional purposes and were in favor of their use being regulated. (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.)

Essential literature for the chiropractic profession

Barbara Mansholt, John Stites, Dustin Derby, Ron Boesch, Palmer College of Chiropractic

Objective: Evidence-based clinical practice (EBCP) is an accepted practice for informed clinical decision making in current mainstream health care professions. EBCP augments clinical experience and can have far-reaching effects in policy, reimbursement, and clinical management. The proliferation of published research can be overwhelming, and finding a mechanism to identify literature that is essential for practitioners and students is desirable. This study was performed to identify that essential literature as considered by leaders and researchers in the chiropractic profession. **Methods:** Deployment of an institutional review board exempted survey occurred with 68 academic and research leaders using SurveyMonkey. Individuals were solicited via email in August 2011; the study closed in October 2011. **Results:** Forty-three individuals consented to participate; 17 contributed at least 1 article of importance. A total of 40 unique articles were reported. Of the 6 articles contributed more than once, 1 article was reported 6 times, and 5 were reported twice. **Conclusion:** A manageable list of quality relevant literature was created. A wide variety of quality articles were reported as "essential" knowledge. Annual or biannual surveys would be helpful for the profession. (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 pediatric case of McCune-Albright syndrome in a 5-year-old female at a chiropractic teaching clinic

Kenice Morehouse, Stephen Grand, Palmer College of Chiropractic

Introduction: This case report describes a 5-year-old female who was diagnosed with McCune-Albright syndrome (MAS) while a patient at a chiropractic teaching clinic. **Methods:** Records were obtained and reviewed. Key search terms were**:** McCune-Albright Syndrome, Fibrous Dysplasia, Café-au-lait spots Case Report; In 2008 a 17-month-old female presented to a chiropractic teaching clinic with upper respiratory symptoms. Upon examination, a large café-au-lait spot was noted on the left side extending from her ribs to her hip. In 2012, the patient's dermatologist ordered x-rays of her appendicular skeleton. The radiologist's impressions were that of polyostotic fibrous dysplasia. The patient was diagnosed with MAS by her dermatologist. **Discussion:** MAS was first described in 1937. The syndrome was characterized by polyostotic fibrous dysplasia, café-au-lait pigmentation, and precocious puberty. This was known as the MAS triad 2. **Conclusion:** Presence of multiple café-au-lait spots may be indicative of pathology and should be explored further. (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.)

Successful management of chronic shoulder impingement syndrome with multi-modal chiropractic care and home exercise: a case report

Adam Morrell, Sherman College of Chiropractic

Objective: To describe the chiropractic management of a geriatric patient with chronic shoulder impingement syndrome (SIS) and underlying post-traumatic stress disorder (PTSD) utilizing instrument assisted soft tissue mobilization (IASTM) including more commonly reported manual and exercise care strategies. **Clinical Features:** A 68-year-old patient presented with insidious chronic left shoulder pain limiting abduction to 40 degrees with a "catching" sensation. The patient was only able to achieve further abduction by using his opposite hand to move the affected arm. He was unable to perform any left shoulder movements in abduction without pain levels of 5–7 of 10 for at least 15 years. Underlying PTSD had interfered with sleep for at least 10 years. **Intervention and Outcome:** Five visits of care included IASTM through painful movements, scapular

mobilization (SM), spinal adjustment, and home exercise focused on proper scapular integration. At the 3-month follow-up visit, the patient had achieved full, pain-free abduction and was able to perform all overhead activities without effect. **Conclusion:** Multimodal chiropractic care including active IASTM, SM, adjustment, and home exercise appeared to lead to sustained pain relief and functional improvement in the case of a geriatric patient with chronic SIS. (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.)

Salter Harris II fracture of second proximal phalanx of the toe: a chiropractic perspective

Mark Murdock, Palmer College of Chiropractic

Objective: The purpose of this report was to present a case to chiropractors where a seemingly innocuous injury caused a fracture in a child. This report will explore some preliminary conclusions from this event. **Clinical Features:** A 9-year-old child fell while playing without wearing shoes. She was experiencing pain especially when she walked or moved her toe. There was minor swelling and bruising. **Intervention and Outcome:** Plain film x-rays revealed Salter Harris fracture type II of the 2nd proximal phalanx. The child's toe was splinted by "buddy taping" and referral was made to an orthopedist who recommended the same approach. **Conclusion:** Chiropractors should x-ray sites of injury with significant findings resulting from trauma despite histories suggesting seemingly innocuous mechanisms of injury. Chiropractors can manage uncomplicated cases of toe fractures if within their scope of practice for their state; otherwise, they should refer to an orthopedist. (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.)

Utilization of diagnostic ultrasonography in the evaluation of osseous fractures of the appendicular skeleton: a review of the literature

Stephanie Mussmann, D'Youville College

Objective: The purpose of this qualitative and quantitative systematic literature review was to analyze and summarize the findings and validity of diagnostic ultrasound as a diagnostic tool for the identification of osseous fractures of the appendicular skeleton. **Methods:** A systematic literature review of 3 electronic databases from 1900 to 2012 was performed. Articles were filtered based upon predefined inclusion and exclusion criteria. **Discussion** Ultrasound boasts a number of advantages as a diagnostic screening tool. Fractures may be identified on ultrasound imaging by the presence of cortical disruption, step-off deformity, or avulsion fragment. Associated soft tissue findings including hematoma, joint effusion, and swelling can also aid the identification of fractures. This imaging modality can also be used to visualize the appearance of healing callus prior to its x-ray appearance. Furthermore, ultrasound is ideal for the evaluation of unossified pediatric physes. Overall, diagnostic ultrasound demonstrates an average sensitivity of 92.1% and specificity of 90.5% for the diagnosis of osseous fractures of the appendicular skeleton. **Conclusion:** The demonstrated reliability of ultrasound to detect osseous fractures of the appendicular skeleton and unique advantages make this imaging modality distinctive and valuable in the evaluation of the musculoskeletal 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.)

Knowledge of assessment and management of headaches: a survey of chiropractic interns

Mark Pfefer, Stephan Cooper, Jon Wilson, Derrick Dube, Richard Strunk, Cleveland Chiropractic College

Introduction: Headache is a very common disorder and accounts for approximately 4% of general practitioner visits annually. Chiropractors in training must learn how to evaluate and manage patients who present with head and facial pain and should understand the important red flags associated with potentially serious conditions. **Methods:** A survey was developed to explore chiropractors' knowledge of assessment and management of the patient with headache and facial pain using open-ended questions, multiple-choice questions, and level of agreement or disagreement with treatment approaches. This project received institutional review board approval. **Results:** Twenty-four interns completed and returned the survey. Over 90% of the sampled interns were able to list at least 5 signs or symptoms associated with a potentially serious, emergent condition. Over 80% of the sampled interns were familiar with typical headache incidence and were able to accurately diagnose various types of headaches. **Conclusion:** Chiropractic student interns demonstrated good knowledge of signs and symptoms associated with ominous, emergent conditions and demonstrated good knowledge as to how these patients should be appropriately treated. There were gaps in knowledge associated with current medical management of migraine and with diagnosis of unusual neurologic conditions associated with headache. (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.)

Acute spinal cord compression resulting in myelomalacia: a case report

Steven Piper, Janet Walters, Glen Harris, Canadian Memorial Chiropractic College

Background Context: National Spinal Cord Injury Center statistics report a significant amount of new spinal cord injuries (SCIs) every year. Sports are the 3rd most common cause of SCI. While SCI can result in permanent damage, SCI patients may not realize the

severity of the injury and continue to function. The chronic stages of SCI may be progressive and can lead to severe respiratory distress and death. Therefore, acute recognition and management of SCI are the keys to preventing further damage from occurring. **Purpose:** The objective was to detail the presentation of an acute blow to the right side lower back causing transient right leg parasthesia in a ball-hockey referee during a game. This case will provide a clinical presentation including examination, advanced imaging, and predisposing factors of injuries to the spine to help identify and effectively manage similar complicated spinal cord injuries. **Study Design:** Case report and outcome measures, including visual analogue scale and Oswestry disability index were used. **Conclusions:** SCI are often difficult to diagnose. The importance of early detection using clinical testing and advanced imaging while understanding predisposing risk factors of contusive SCI resulting in myelopathy leading to myelomalacia were discussed. (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.)

Tibial plateau fracture following anterior cruciate ligament reconstruction: co-management of a rare complication

J. Ali Rabatsky, Palmer College of Chiropractic

Introduction: Complications of anterior cruciate ligament (ACL) reconstruction surgery are well-documented but fracture through the graft tunnel is rare. The author describes a tibial plateau fracture following ACL reconstruction using allograft and how it was co-managed between providers. **Case Report:** A 36-year-old male presented with pain and edema following a fall from a height. The patient reported having undergone arthroscopic ACL reconstruction 3-½ years prior. Computed tomographic scan revealed a comminuted fracture extending through the tibial tunnel, as well as evidence of tunnel widening and incomplete bone resorption and generation within the tibial tunnel. The plateau fracture was repaired with internal fixation and the patient received regular chiropractic care twice per week. **Discussion:** Stress riser effect caused by bioabsorbable interference screws, bone resorption, and tunnel widening likely resulted in fracture in this patient. Treatment offered by the chiropractor helped contribute to the relatively expeditious recovery observed in this patient. **Conclusion:** ACL reconstruction is a common surgical procedure and health care providers should be aware of its complications. The combined forms of treatment offered by both practitioners yielded a far superior outcome than either would have alone and highlights the significant role chiropractors can play in co-managing this injury. (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 sonographic squeeze test: assessing reliability of the of the dorsal scapholunate ligament

Kenneth Reckelhoff, Logan College of Chiropractic, Thomas Clark, MSKUS, Norman Kettner, Logan College of Chiropractic

Introduction: There is no universally accepted imaging method to diagnose scapholunate ligament (SLL) tears. Our aim was to use sonography to evaluate the reliability of SLL length at baseline compared with a standardized dynamometer maneuver in healthy normals. **Methods:** Sonographic examinations from 31 consented asymptomatic subjects between the ages of 18–45 years were collected on a total of 60 wrists. The length of the SLL was measured superficially and at a depth of 3.0 mm during resting and dynamic squeeze maneuver. Inter- and intra-examiner reliability was performed using intraclass correlation coefficient. **Results:** The superficial ligament length measured 0.60 +/- 0.11 cm with a deep measurement of 0.20 +/- 0.06 cm. Dynamic evaluation revealed superficial and deep measurements at 0.62 +/- 0.12 cm and 0.20 +/- 0.06 cm, respectively. There was no significant difference between the SLL length at rest and during the squeeze test. The inter- and intra-examiner reliability was rated at fair to very good across both techniques. **Conclusion:** Evaluation of the dorsal SLL by sonographic squeeze test was reliable. Future studies will apply this method in suspected SLL tears. (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 management of trigeminal neuralgia: a case study

Robert Rectenwald, Life University

Objective: To report the management of trigeminal neuralgia (TN) using Atlas Orthogonal (AO) technique spinal adjusting and Activator Methods technique (AMT) tempromandibular joint (TMJ) adjusting. **Clinical Features:** A 77-year-old female presented to a chiropractic clinic with right side facial pain of 2-months' duration. The pain was rated as a constant 8 of 10 on the numerical pain scale with episodes of 10 of 10. She had a secondary complaint of clicking in the jaw. A neurologist first diagnosed TN and prescribed medication and physical therapy, which were not palliative. **Interventions and Outcomes:** The atlas vertebra (C1) was adjusted on 6 visits. The TMJ was adjusted on 8 visits. Treatment consisted of 11 visits over 9 weeks. After 4 weeks, the pain was rated as 1 of 10. After the 7th week, all pain was resolved. SF-36 physical component summary (PCS) and mental component summary (MCS) scores improved: PCS 22, MCS 21 were reduced to PCS 55, MCS 45. **Conclusion:** Cervical spine and TMJ dysfunction may be contributing factors in the symptomatic expression of TN. In this case, chiropractic care was an effective conservative approach for managing the symptoms associated with TN. (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 association between body mass index and response to spinal manipulation for patients with subacute and chronic low back pain

Christopher Roecker, Joel Pickar, Dana Lawrence, Robert Vining, Cyndy Long, Palmer Center for Chiropractic Research

Introduction: Low back pain (LBP) persisting past 1 month is difficult to treat. Spinal manipulative therapy (SMT) is a common treatment for LBP, and identifying patients likely to respond to SMT is a research priority. Increased body mass index (BMI) may influence response to SMT for subacute or chronic LBP. We investigated the relationship between BMI and response to SMT for subacute and chronic LBP. **Methods:** We performed secondary analysis on 192 subacute or chronic LBP patients from a 2-week randomized clinical trial of SMT. Multiple linear regression was used to model the relationship between baseline BMI and Roland-Morris disability questionnaire (RMQ) and Visual Analog Scale (VAS) change scores (baseline to 2-week follow up). This project was exempt from full ethical review. **Results:** There was no significant relationship between BMI and RMQ or VAS scores. Each increase in 1 kg/m^2 BMI resulted in a 0.07 point decrease in RMQ change score and a 0.03 point decrease in the VAS change score. These changes were not clinically important or statistically significant. **Conclusion:** We found no relationship between BMI and RMQ change scores or VAS change scores following a 2-week trial of SMT for subacute or chronic LBP. (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 case of breech repositioning unresponsive to Webster Technique: coexistence of oligohydramnios

Christopher Roecker, Palmer Center for Chiropractic Research

Objective: The purpose of this report was to describe the management and clinical outcome of a pregnant woman demonstrating breech fetal presentation treated with Webster Technique, a chiropractic procedure used to encourage cephalic presentation, in the presence of oligohydramnios. **Clinical Features:** A 23-year-old nulliparous woman sought chiropractic management of breech presentation and bilateral sacroiliac arthralgia at 34-weeks' gestation. Initially, the fetus was palpated in the breech presentation and the patient rated her sacroiliac pain as an 8 of 10 on the numeric pain rating scale. **Intervention and Outcome:** The patient was treated with sacral manipulation and abdominal trigger point therapy (Webster Technique) for a total of 7 treatments. Breech presentation was unchanged and her sacroiliac pain reduced from 8 of 10 to 3 of 10. The patient underwent a prenatal surveillance ultrasound at 37-weeks' gestation, revealing oligohydramnios, resulting in referral for emergency Caesarean section delivery. **Conclusion:** Clinicians who use Webster Technique to manage breech fetal presentation should be aware of the possibility of undiagnosed comorbidities as a complicating factor in clinical presentation. As pregnancy approaches term and normal fetal positioning is not achieved, doctors of chiropractic should consider screening for undiagnosed complicating conditions, such as oligohydramnios. (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.)

Comminuted scapular body fractures: a report of 3 cases managed conservatively in chiropractic settings

Julie Scarano, Santiago Chiropractic Associates, Matthew Richardson, Palmer College of Chiropractic Florida Campus, John Taylor, D'Youville College

Fractures of the scapula are relatively uncommon. Fractures specific to the scapular body comprise 35–65% of these fractures. Currently, 99% of all isolated scapular body fractures are being treated nonoperatively with an immobilizing sling or brace and some form of manual therapy with an 86% success rate. We present the conservative management of 3 patients with comminuted fractures involving the scapular body that were managed in chiropractic settings. Residual disabilities in these 3 patients as measured by a standardized outcome tool were 2%, 5% and 23% after 3 years, 2 years, and 6 years, respectively. (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 role of chiropractic in collective health: the perspective of chiropractors

Thiana Paula Schmidt dos Santos, Feevale University, Lucilda Selli, UNISINOS, Marta Casagrande Saraiva, Feevale University

Introduction: The objective of the present study was to verify the concept that chiropractors have regarding what collective health is, the relationship that they establish between collective health and chiropractic, and possible areas within collective health in which chiropractors can engage. **Methods:** Qualitative exploratory research. Fifteen chiropractors practicing for at least 2 years in southern Brazil participated in the study. Data was collected with a semi-structured interview. **Results/Discussion:** A good concept of what collective health is was verified among the chiropractors. They were able to establish an important relationship between collective health and chiropractic related to preventive and educational measures. They also envisioned possible areas in which chiropractors can engage regarding collective health, not only in private practice, but also in other work settings. They indicated the Brazilian health system and multidisciplinary settings as main work settings for chiropractors

in collective health. **Conclusion:** Although chiropractors present good knowledge on collective health, the lack of work opportunities in the health system results in a patient centered practice focused on intervention, distanced from actions towards collective health. This leads to practice that reproduces the biomedical model, with chiropractors in a patient centered practice that is disconnected from collective health measures. (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.)

Pregnancy, sacroiliac joint laxity, and the sacro occipital technique category II pelvic distortion: a case series

Rodney Shelley, Charles Blum, Sacro Occipital Technique Organization

Introduction: Sacroiliac (SI) joint laxity associated with pregnancy and delivery is purported to cause objective findings of a sacro occipital technique (SOT) category II pelvis. SOT describes a category of pelvic girdle pain and/or low back pain (PPLP) associated with increased posterior SI joint ligamentous laxity called category II. This institutional review board approved retrospective case series study involved 103 pregnant women from 21–32 years old seen at this clinic from 1979–1983. **Methods:** Patients were evaluated via SOT diagnostic protocol, which included the SOT arm fossa test, increased unilateral or bilateral iliopsoas tension, palpation for pelvic torsion, leg length differentials, and Moiré contour photography. **Results:** Ninety-five percent of the patients had Arm Fossa Test positive (AFT+) findings, with 5 of the 103 patients having an Arm Fossa Test negative (AFT-). AFT- findings were associated with reduction or elimination of pelvic or inguinal pain, improvement of muscle strength and ability to rise from a seated position as well as lift or carry objects, and improved sleep and restfulness. **Conclusion:** Treating a pregnant patient in a supine position using gravity and pelvic wedges may offer a viable treatment method for pregnancy related PPLP. (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.)

An integrated approach to the management of temporal mandibular dysfunction: a case study

Peter James Shipka, Private Practice

Objective: The purpose of this study was to discuss the management and outcome of temporal mandibular joint dysfunction (TMD/TMJ) utilizing acupuncture, active release, Traumeel, chiropractic manipulation and a dental appliance. **Introduction:**TMD/TMJ is the term used to describe acute or chronic dysfunction of the joint between the temporal bone and the mandible. This dysfunction may involve the muscles of mastication, nerves, tendons, ligaments, bones, connective tissues and teeth. **Clinical Features:** A 43-year-old female presented to a chiropractic clinic complaining of severe jaw, headache, and neck pain contributed to an injury that occurred 10 years previous. The "lock jaw" had been present for greater than 6 weeks and had restricted her jaw opening to less than 10 mm. **Intervention and Outcome:** An initial session of acupuncture and chiropractic manipulation provided significant improvement and a series of follow-up visits saw a significant reduction of symptoms and open distances. Dental appliance modifications were also done. **Conclusion:** Chiropractors who see TMD/TMJ patients should consider an integrated and holistic approach to TMD management. (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.)

Does participating in a simulated cardiac arrest scenario, using high fidelity manikins, improve an intern's technical emergency care skills: a case study

David Starmer, Sean Duquette, Dominic Giuliano, Kevin Finn, Andrew Miners, Anthony Tibbles, Canadian Memorial Chiropractic College,

Purpose: This pilot study investigated the effectiveness of using a simulated cardiac arrest scenario for improving an intern's application, efficiency, and retention of critical first aid skills over a 10-month period. **Case Study:** Using a case study method, 4 recorded videos over a 10-month time frame with 1 intern in the role of attending doctor were retrospectively analyzed. The intern's efficiency in applying critical first aid procedures was objectively measured by the time they were initiated. The critical skills investigated were calling 911, initiating cardiopulmonary resuscitation (CPR), automated external defibrillator (AED) activation, and passive administration of oxygen. **Results:** The intern became increasingly efficient after the initial simulation in calling 911 (66 sec faster) and initiating CPR (67% faster). The time to use the AED stayed relatively constant with all events occurring under 162 seconds. The administration of passive oxygen was not used at baseline testing and was used inconsistently in follow-up simulations. **Discussion:** An improvement in the proficiency of applying critical skills was observed in the case study after the simulation experience, which may have increased the chance of patient survival. This case provides reinforcement for the use of simulation as a tool for educating health care 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.)

The effects of multimodal chiropractic care on pain and disability in a patient diagnosed with benign joint hypermobility syndrome and chronic pain: a case report

Richard Strunk, Mark Pfefer, Curtis Fletcher, Cleveland Chiropractic College

Introduction: Benign joint hypermobility syndrome (BJHS) is a hereditary connective tissue disorder defined by pain and hypermobility in multiple joints. The purpose of this article was to describe the clinical response to multimodal chiropractic treatment of a patient diagnosed with BJHS and chronic pain. **Methods/Clinical Features:** A 23-year-old white female presented with chronic headaches and right neck and low back pain. The patient was diagnosed with BJHS by a Beighton score of 6 of 9 and 2 minor Brighton criteria. The patient received low force joint manipulative therapy, soft tissue mobilization, proprioceptive exercises, and home care advice/exercises over a course of 18 weeks. The Headache Disability Index (HDI) and Neck Disability Index (NDI) and the Oswestry Low Back Questionnaire (OLBQ) were the main outcomes. **Results:** The HDI and OLBQ decreased 12 points each at the end of care. The NDI increased at week 8 and subsequently decreased to near its baseline value at weeks 15 and 18. **Discussion:** BJHS is a challenging condition to manage. **Conclusion:** A detailed description of a patient diagnosed with BJHS and treated with multimodal chiropractic care is presented. BJHS presents unique treatment challenges leading us to need more research on this topic. (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.)

Patient perceptions of access and benefits of chiropractic: a qualitative study

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Introduction: Study of perceptions of accessibility and benefits of chiropractic could highlight patients' abilities and desires to access chiropractic care. This study explored whether patients perceive that chiropractic care is widely available and accessible to all population groups. The results can then inform health care providers of patient perception in order to influence appropriate care provision and delivery. **Methods:** Following ethical approval, an exploratory, qualitative design using semi-structured interviews was undertaken to allow study of complex perceptions and experiences. Participants were recruited from a chiropractic college clinic and were allocated into groups dependent upon their stage in the therapeutic process. Semi-structured interviews were audio recorded and all transcripts were thematically analyzed to appropriate trends. **Results:** Perception and experience is that chiropractic is not accessible via mainstream heathcare provision and that all groups considered care to be expensive. Benefits of care were exclusive to management of musculoskeletal conditions. Patients under maintenance care experienced greater health benefits. **Conclusion:** Chiropractors and medical doctors have a part to play in improving patient education and awareness and, with government health care policy makers, to create the necessary interdisciplinary relations to facilitate access to care and to improve health outcomes and access. (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 chiropractic physicians' practices for patient history, physical examination, and diagnosis

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Objective: To investigate chiropractic physicians' practices for patient history, physical examination, and diagnosis. **Methods:** Using non-random surveys, summary statistics and item comparisons for categorical and continuous variables were reported (SAS 9.2; Cary, NC). **Results:** A convenience sample of 339 chiropractic physicians completed a 416-item survey of their demographics, patient histories, physical examination practices, and diagnosis practices. Three groups were identified based on reported frequency of routinely performing the surveyed tasks: low (1st quartile, n = 82 [24%]), middle (2nd and 3rd quartiles, n = 175 [52%]), and high (4th quartile, n = 82 [24%]). Statistically significant differences were found between groups for 398 of 401 (99%) of the surveyed items. The low group performed considerably below Council on Chiropractic Education (CCE) meta-competency 1 standards, the middle group performed somewhat below CCE meta-competency 1 standards, and the high group performed generally consistent with CCE meta-competency 1 standards. **Conclusion:** The extent to which full-time chiropractic physicians in the sample reported practicing patient history, examination, and diagnosis procedures varied widely with 24% of respondents performing at a level generally consistent with CCE standards for assessment and diagnosis and the Institute of Medicine guidelines for differential diagnosis. (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 single blind, one-group pretest–post-test pilot study of the effects of active release technique on cervical and thoracic range of motion

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Objective: To investigate the effects of the active release technique (ART) on cervical spine (CS) and thoracic spine (TS) ranges of motion (ROM) in asymptomatic adult participants with restricted range of motion. **Methods:** A single blind, 1 group pretest–post-test clinical trial pilot study. This study received institutional review board approval. Data were analyzed with a hierarchical repeated measures model (SAS 9.2; Cary, NC). **Results:** A convenience sample of 26 consenting adults (20 male, mean age=27.8) completed the study. Goniometric CS and TS ROM measurements were taken in counterbalanced order by blinded examiners before and after a single ART treatment. Statistically

significant increases were found in 8 of 11 ROMs measured: CS flexion, CS right rotation, CS left rotation, CS left lateral flexion, CS right lateral flexion, TS flexion, TS left rotation, and TS left lateral flexion. There were no dropouts and no adverse events reported. **Conclusion:** For the participants in the current study a single ART treatment resulted in significant increases in 8 of 11 CS and TS ROMs. (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.)

An observational study of "normal" and "best" posture in normal weight, overweight, and obese chiropractic college students

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Objective: To compare normal vs best posture in normal weight, overweight, and obese chiropractic college students. **Methods:** This observational study was approved by the institutional review board. A convenience sample of 100 consenting normal weight, overweight, and obese adult students had lateral digital posture photographs taken (Biotonix BioPrint System; Montreal, Canada) in what the participants considered their "normal" and "best" postures. Postural parameters measured were head-to-shoulder, shoulder-to-pelvis, pelvis, hip-to-knee, and knee-to-foot angles. Summary statistics, Pearson's correlations between "normal" and "best" posture, and one-way ANOVAs between groups were reported (SAS 9.2; Cary, NC). **Results:** No statistically significant differences were found for the total sample between "normal" and "best" postures for any postural parameters ($R = .75$). Head-to-shoulder angles were anterior in all 3 groups with the obese participants having the least anterior head carriage. Angular differences between "normal" and "best" posture decreased from head to pelvis. Obese participants' postural angles were significantly less negative for shoulder-to-pelvis angle and significantly more positive for pelvis-ankle angle. **Conclusion:** Total sample normal and best postures were not significantly different in the observed participants. Significant differences were found for some postural parameters between obese and overweight/normal groups. (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 case study: Gonstead chiropractic care in a patient with brachial plexus dysfunction

Michael Tomasello, Life University

Introduction: The purpose of presenting this case was to describe the chiropractic management of a patient presenting with right side brachial plexus motor weakness utilizing the Gonstead Technique. **Case Report:** The 40-year-old female patient presented to the office after a slip and fall down a set of 5 steps, with lower cervical pain on the right side described as a "pinched nerve." She also complained of right hand and shoulder weakness that progressed over a 2-week period. She stated that she could not hold her children or brush her hair. The right side deltoid and 5th digit opposition and adduction/abduction motor function was 3 of 5 with mild hypothenar atrophy. Chiropractic care was delivered based on the Gonstead technique including x-rays, nervoscope instrumentation, palpation, and specific Gonstead technique high velocity/low amplitude adjusting. **Discussion:** The patient demonstrated a significant improvement in the weakness and pain after a single adjustment. She continued to improve over the next 2 months with all symptoms and 5th digit weakness resolving and 4 of 5 weakness remaining in the right deltoid. **Conclusion:** Gonstead chiropractic care seemed to be successful in relieving the pain and motor weakness in this patient. (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 of a patient with postcortical atrophy with chiropractic manipulation and dynamic neuromuscular stabilization: a case report

Michael Tunning, Vinicious Francio, Ron Boesch, Palmer College of Chiropractic

Introduction: A 54-year-old male presented to a chiropractic clinic with stiffness and tightness in the neck and back. He was later diagnosed with posterior cortical atrophy (PCA) and sought care at a chiropractic clinic. **Interventions and Outcomes:** Chiropractic manipulative therapy was utilized as primary treatment with reflex locomotion or dynamic neuromuscular stabilization, proprioceptive training exercises, and vibration over distal extremities as adjunct therapies. Outcome measurements were performed and health status questionnaire demonstrated a 60% improvement in the patient's perception. No changes on memory loss progression, space orientation, and speech disturbances were observed. **Discussion:** This presentation of PCA was treated using the techniques described by Kolar including manipulation, inhibitory stretching protocols, and facilitating exercises. Balance and proprioception exercises using solid ground and 2-way wobble boards were used with eyes open and closed. **Conclusion:** A 54-year-old patient with PCA was evaluated and treated with improved outcomes in a chiropractic clinic. (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 association between low back pain and bowel and bladder dysfunction: a narrative review

Anna Walden, Palmer Center for Chiropractic Research

Introduction: There appears to be an associated link between low back pain (LBP) and bowel and bladder dysfunction but little is understood about the cause and effect relationship. This is a review of the literature of the pathoanatomical relationship between LBP and bowel and bladder dysfunction. **Methods:** A search of PubMed and Index to Chiropractic Literature was performed. References from relevant papers were evaluated. Articles were separated into 2 categories: LBP and gastrointestinal dysfunction, and LBP and urinary incontinence. **Results:** Of the 410 search results, 70 abstracts were initially reviewed. Ten pertinent papers were entirely reviewed, resulting in 5 articles within each of the 2 categories. **Discussion:** Viscerosomatic-associated hypothesis suggested referred pain and incoordination of the pelvic floor and trunk muscles led to an effect on continence and lumbopelvic control in relation to LBP. There is also evidence that degenerative changes of the lumbar spine produce enough mechanical derangement to consequently affect the somatic and autonomic influences of the pudendal and pelvic splanchnic nerves. **Conclusion:** An association between LBP and bowel and bladder dysfunction exists but there is no level I evidence that proves a direct cause and effect relationship of the association. (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.)

Comparison of other palpation techniques of the thoracic spine to the motion palpation technique: a pilot study

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Introduction: Different methods have been used by manual therapy practitioners to determine where and how the spine should be manipulated. The purpose of this study was to compare leg length assessment, visual assessment, Qi energy sensation, and palpation of tenderness to the motion palpation technique for the thoracic spine. **Methods:** In this pilot study, 5 examiners identified subluxations among 50 chiropractic students using a different palpation technique. The Kappa test was used to determine the level of agreement. **Results:** The agreement between motion palpation technique and the other techniques ranged from none to slight. At the individual vertebrae level, agreement was similar to the exceptions of visual inspection at T1 (0.357) and leg length assessment at T12 (0.345). **Discussion:** Clinicians who use manual manipulation techniques should not rely on palpation alone to determine where adjustments should be performed. **Conclusion:** This study did not find acceptable levels of agreement between motion palpation and 4 other palpation methods for detecting subluxations in the thoracic spine. Further research is needed to find reliable and valid diagnostic methods for manual therapy practitioners. (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 management of an equestrian athlete with sacroiliac dysfunction and muscle imbalance: a neurotensegrity approach

David Ward, Lone Tree Chiropractic and Natural Health Center, Tasmin Fanning, Life University

Objective: Assess a neurotensegrity approach in the chiropractic care of an equestrian athlete with vertebral subluxation, hip pain, gait instability, and diaphragmatic dysfunction who presented after a fall from horseback. **Clinical Features:** A 58-year-old woman had left anteromedial hip pain and instability in gait that persisted after falling from her horse. **Intervention and Outcome:** Integration of treatment based on a new approach, neurotensegrity, guided the management plan for the patient, including muscle energy technique, integrated neuromuscular inhibition technique, and diversified technique adjustments. Specific rehabilitation exercises, targeting breathing patterns and core stability were also used as an integral part of care. The patient reported decreased left hip pain and increased stability in gait after chiropractic intervention. **Conclusion**: The chiropractic management of a patient with left anteromedial hip pain, gait instability, and diaphragmatic dysfunction following a fall from horseback was presented. Complete resolution of the patient's symptoms was achieved through application of an integrated systems approach concomitant with a reduction in subluxations at thoracic and pelvic regions of the spine. This is the second report in indexed literature of chiropractic care of an equestrian athlete. (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.)

Lumbar spine manipulation impact on maximal oxygen consumption

John Ward, Jesse Coats, Michael Ramcharan, James Zuniga, Cheuk Chu, Texas Chiropractic College

Purpose: The purpose of this study was to determine if mid-lumbar spine chiropractic manipulative therapy (CMT) had any impact on runner performance. **Methods:** Ten male and 10 female college students were equally randomized into an AB:BA crossover study design. Ten participants were in the AB group and ten were in the BA group. The study involved 1 week of rest between each of the 2 conditions, A (bilateral sideposture L3 CMT) vs B (no CMT) preceding the exercise test. Outcome measures were exercise heart rate and rating of perceived exertion monitored at the conclusion of each 3-minute test stage, blood lactate concentration at baseline and at the conclusion of the test, and exercise time to exhaustion. The exercise test continued until the participant reached volitional exhaustion. A dependent samples *t* test was used to make comparisons between A vs B conditions. This study was approved by our institutional review board.

Results: No statistically significant difference was shown among any exercise response variables although clinically important changes in blood lactate were noted. **Conclusion:** The results of this research preliminarily suggest bilateral side-posture CMT to L3 does not significantly impact exercise performance during a treadmill-based maximal oxygen consumption test. (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.)

Pilot study of the impact sacroiliac joint manipulation has on leg length inequality

John Ward, Jesse Coats, Ken Sorrels, Matthew Walters, Trevor Williams Texas Chiropractic College

Purpose: The purpose of this pilot study was to evaluate the feasibility of engaging in a series of larger studies measuring the biomechanic impact of sacroiliac joint manipulation. **Methods:** Twelve college students engaged in a baseline 90-second gait analysis using infrared VICON cameras. Next they underwent a leg-length inequality (LLI) test to classify them initially as left short leg, right short leg, and no short leg. Participants in each of the 2 short leg branches were then randomized to receive either (1) chiropractic manipulative therapy to the posterior superior iliac spine on the short limb side or (2) no manipulation. Recruitment continued until participants were in each of the following 5 groups: left short leg-manipulation, left short leg-no manipulation, right short leg-manipulation, right short leg-no manipulation, and no short leg. All participants then underwent another 90-second gait analysis. Pre- vs post-gait data was then reviewed by a blinded biomechanist. This study was approved by our institutional review board. **Results:** No statistically significant differences were measured due to this being a pilot study with a small sample size. **Conclusion:** The data from this study indicates that a series of larger studies with this study design are feasible. (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.)

Resolution of migraine headaches with a comprehensive care plan: a case report

Howard Wasdin, Absolute Precision Chiropractic, Catherine O'Neill, Grace Wellness

Objective: The purpose of this case report was to report on a multi-modal, comprehensive conservative approach to address the structural components and nociceptive structures contributing to migraines in a patient. **Clinical Features:** The patient presented as a middle-aged female in good health, with a 20-year history of migraine symptoms. The headaches began without trauma, but had recently been exacerbated by a motor vehicle crash. **Intervention and Outcome:** The patient began a 60-day course of treatment for migraines and neck pain, including 15 minutes of transcutaneous electrical stimulation in the cervical region, moist heat, cervical traction, and chiropractic adjusting of the cervical region utilizing Activator protocol. The patient noted marked improvement in the frequency of headaches (reduced to 1 per week) and neck pain by the 5th visit (2 weeks). By her 6th and 7th visit, she was asymptomatic with a reduction in the frequency of headaches (less than 1 per week), and her neck pain was resolved. **Conclusion:** Using a multimodal approach to address the various structures involved in the etiology of migraines provided pain relief comparable to medications and corrected the underlying somatic dysfunction. More research is needed to determine the efficacy and costs of multimodal conservative care for migraine patients. (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 current attitudes among chiropractic students and clinical faculty

Jon Wilson, Mark Pfefer, Stephan Cooper, Richard Strunk, Cleveland Chiropractic College

Introduction: A discourse continues among chiropractors regarding issues related to terminology, scope, and practice approaches. This paper provides information that describes chiropractic students' and chiropractic college faculty members' current attitudes relative to many issues related to health care and chiropractic practice. **Methods:** A survey was developed and administered to chiropractic students and clinical faculty at 1 chiropractic college. This study was reviewed and approved by a chiropractic college institutional review board. **Results:** A total of 79 students (22 trimester 1, 27 trimester 6, 30 trimester 9) and 11 clinical faculty members returned completed surveys. Chiropractic students and faculty demonstrated agreement that the term "subluxation" has usefulness in chiropractic practice and, in this survey, believe that subluxation is associated with visceral disorders. Respondents also demonstrated agreement that chiropractic care prevents future back and visceral health conditions. **Discussion:** Participants were in agreement that chiropractic practice should be evidence-based, yet there is a potential disconnect with beliefs about prevention of future back and visceral health conditions in spite of limited supportive 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.)

Changes in clinical and radiographic parameters after a 2-week regimen of chiropractic manipulation combined with soft tissue therapy and neuromuscular rehabilitation in 7 adult patients with idiopathic scoliosis

Alan Woggon, CLEAR Scoliosis Institute, Daniel Martinez, Independent Researcher

Background: A diagnosis of adolescent idiopathic scoliosis (IS) can continue to impact the health status

of the patient post-skeletal maturity. An adult with IS may have increased risk of pain, lower perception of quality of life, and decreased social and emotional health. Surgery is the sole recommended treatment for adults. Basic clinical research at any level on conservative care would be helpful to clarify patient options. **Aim:** This study presents a review of files of 7 adult IS patients treated with a comprehensive 2-week treatment protocol including chiropractic manipulative therapy, massage, exercise, and whole-body vibration therapy, followed by a home rehabilitation regimen. Clinical outcome measures included digital spirometry, scoliometry, timed one-legged stability, and computerized dual inclinometry. X-ray measurements included Cobb angle, vertebral rotation, and apical lateral deviation. Questionnaires included a visual analog pain scale scale, RAND SF-36, and SRS-22. **Results:** The mean Cobb angle change was −9.6. The mean change in peak expiratory flow was +540 cc. The mean change in trunk rotation was −3.5. **Conclusion:** While no extrapolation beyond the involved subjects can be made, the results support the premise that spinal deformity is not irreversible. Further research into conservative care options for adult IS patients 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.)

Delivering quality chiropractic care to a cerebral palsy patient in an outpatient teaching clinic: a case report

Amy Wright, Victor Benavides, Texas Chiropractic College

Introduction: Cerebral palsy is the most common physical disability in childhood. It has been described as a "group of non-progressive, but often changing, motor impairment syndromes secondary to lesions of the brain arising in the early stages of development." **Clinical Features:** The patient in this case is a 26-year-old male with spastic hemiplegia cerebral palsy. The history was obtained from the patient's mother at the time of initial visit. He was born at 36 weeks' gestation following complications during labor and delivery. **Intervention and Outcome:** There is now evidence that strength training programs can increase muscle strength in people with cerebral palsy. This patient demonstrated improved ability to hold his head up for longer periods of time while attending college classes and completing assignments. **Conclusion:** This case report demonstrates the delivery of quality care in an outpatient teaching clinic. Although educators may not always be aware of the options available to guide patient care, exposure to a patient such as this may further students' knowledge and allow for the development of clinical questions for future research opportunities. (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.)