
Poster Presentations

The Chiropractic Care of Patients With Cancer: A Systematic Review of the Literature

Joel Alcantara, Joey Alcantara, and Junjoe Alcantara, International Chiropractic Pediatric Association

Background: Deaths from cancer worldwide continue to rise, with an estimated 12 million deaths by 2030. More than 30% can be prevented. To investigate the nature of the chiropractic care provided to this patient population, a systematic review of the literature was performed. **Methods:** The following electronic databases were searched: MANTIS (1965–2010), ICL (1984–2010), PubMed (1966–2010), MEDLINE (1965–2010), EMBASE (1974–2010), AMED (1975–2010), CINAHL Plus (1965–2010), Alt-Health Watch (1965–2010), and PsychINFO (1965–2010). Key words used were “cancer” and “neoplasm” in Boolean combination with “chiropractic.” Eligibility criteria were

(1) peer-reviewed primary investigation/report in English journals, and (2) the study involved patients with cancer.

Results: Our systematic review revealed 90 articles consisting of 21 commentaries, two survey study, two reviews of the literature, two case series, and 63 case reports.

Discussion: The case reports are mostly diagnostic in nature and confirm the findings that patients with a prior history of cancer and/or failure to respond to conservative care should be suspected of suffering from a neoplasm. **Conclusion:** Future research is recommended to document the modalities performed by chiropractors and their effectiveness and safety in the care of cancer patients.

A Systematic Review of the Literature on the Chiropractic Care of Patients With Autism Spectrum Disorder

Joel Alcantara, Joey Alcantara, and Junjoe Alcantara, International Chiropractic Pediatric Association

Background: Autism and its related disorders represent a great burden to families and society. Approximately one child in every 110 is classified as having one of the subtypes of autism spectrum disorder (ASD). Since pharmacological agents are not effective for ASD, complementary and alternative medicine therapies have become a viable care approach. Chiropractic is the most popular and highly utilized for children. To provide a context for the chiropractic care of ASD patients, a systematic review of the literature was performed. **Methods:** The following databases were examined: MANTIS (1965–2010), PubMed (1966–2010), Index to Chiropractic Literature (1984–2010), EMBASE

(1974–2010), AMED (1967–2010), CINAHL (1964–2010), Alt-Health Watch (1965–2010), and PsychINFO (1965–2010). Inclusion criteria were peer-reviewed English manuscripts describing chiropractic care for ASD patients.

Results: This systematic review of the literature revealed a total of 10 articles consisting of three case reports, five commentaries, one cohort study, and one randomized comparison trial. **Discussion:** Beyond individual clinical experience and the wants of parents, the scientific literature is lacking on the chiropractic care of patients with ASD.

Conclusions: more research (in both quantity and quality) in this field is recommended.

The Journal of Chiropractic Education

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Vol. 25, No. 1. Printed in U.S.A.
1042-5055/\$22.00

Kinetic Chain Dysfunction in a 16-Year-Old Soccer Player With Ankle Pain

Maria Anderson and Michelle Barber, Palmer College of Chiropractic

Objective: To discuss the case of a 16-year-old female soccer player who sought care for ankle pain during soccer practices. **Clinical Features:** A 16-year-old female soccer player had ankle pain of 3 weeks' duration. The pain was achy, but also sharp and tingly after 15 minutes of running and would ease if she stopped or rubbed the area. Evaluation revealed postural imbalances, weakness of the core musculature and lower kinetic chain, a 30° toe-out foot flare, and subluxation in the lumbopelvic region and lower extremity. **Intervention and Outcome:** The patient

was treated with full spine and extremity adjusting and a functional rehabilitation program focused on the muscle imbalance and weaknesses of the core musculature and lower kinetic chain. She responded well, was able to return to play, and her foot flare decreased to 20°. **Conclusion:** Adolescent patients with sport injuries may benefit from chiropractic and rehabilitation to assist them in improving joint mechanics that can return them to play sooner as well as aid in improving postural distortions.

Management Considerations in a Transtibial Amputee With Charcot-Marie-Tooth Disease

Maria Anderson and Craig Butler, Palmer College of Chiropractic

Background: Charcot-Marie-Tooth (CMT) disease is the most common inherited peripheral neuropathy affecting 1 in 2500. There are two types of Charcot-Marie-Tooth, hereditary motor sensory neuropathy 1(HMSN1) and hereditary motor sensory neuropathy 2(HMSN2), and these are diagnosed by pathologic and physiologic findings. Type 1 primarily affects the myelin sheath and type 2 affects the axon. CMT disease is also further broken down based on the genetic mutations. The clinical presentations are similar in that they both present with foot pain secondary to foot deformity. **Objective:** To discuss the case of a 55-year-old

bilateral transtibial amputee with CMT disease. **Clinical Features:** The patient complained of thoracic and low back pain with associated right thigh pain. **Intervention and Outcome:** A combination of modified chiropractic adjustment, soft tissue work, and postural advice was used. The patient has shown limited response to care concerning back pain; however, thigh pain is gone. **Conclusion:** This paper discusses CMT disease and the management considerations in a patient who has been diagnosed with a peripheral neuropathy and has physical limitations due to recent amputations.

Detecting Cervical Spine Instability: A Comparison of Digital Motion X-Ray and Magnetic Resonance Imaging

Vanessa Ashworth, John Taylor, and Mitch Haas, D'Youville College

Purpose: The purpose of this study was to compare two diagnostic imaging techniques: digital motion x-ray (DMX) and motion magnetic resonance imaging (MRI) to determine if findings of ligamentous cervical spine instability are consistent with each other, in patients presenting with cervical spine pain. **Methods:** Specific radiographic indicators including the presence of ligament injuries, soft tissue abnormalities, increased signal intensity, and anterolisthesis were utilized to determine if both imaging modality findings were consistent in detecting these potential causes of instability. The study was performed at an advanced imaging center in the western New York area. Data were retrospectively compiled from diagnostic imaging reports of 24 subjects who were patients who were referred by primary care doctors, specialists, and chiropractors,

all of whom were imaged with both DMX and MRI. All subjects had complaints of cervical spine pain, instability, or neurological compromise requiring advanced imaging to rule out instability. All reports were then analyzed for key imaging findings suggesting instability: high signal intensity of the anterior longitudinal ligament on T2-weighted MRI images and anterolisthesis on DMX studies. **Results:** The results were analyzed using the kappa statistic to determine the degree of consistency between DMX and MRI findings. In this case the kappa statistic was 0.17, indicating only slight agreement between the two imaging procedures. **Conclusions:** It can be concluded that there is only slight consistency or agreement in cervical spine instability findings between DMX and MRI.

Inclusion of Community Service Opportunities Into a Doctor of Chiropractic Curriculum: A Preliminary Review

Karen Bobak, New York Chiropractic College

Introduction: The inclusion of a community service component into the Doctor of Chiropractic program curriculum was considered an opportunity to foster the active development of professionalism in students about to enter the clinical phase of their education. **Methods:** This strategy involves students taking an active role in community endeavors with the desired result of this work being not only an impact on community needs, but also a support for student learning by linking service back to course content. Challenges related to the implementation of the service requirement

focused on the students' significant per trimester credit hour requirements. **Results:** Over the past year that this opportunity has been available, more than 900 hours of community service have been completed by students. Early qualitative data, gathered from student summative feedback on written reflections, have been positive and suggest that the addition of community service opportunities in a Doctor of Chiropractic program curriculum can be a useful strategy for developing an increased understanding of academic topics and for bridging the gap between course work and professional life.

Glioma With Subdural Hematoma Initial Management: A Case Report

Ron Boesch, Misty Stick, Robert Illingworth, and Elizabeth Borchert, Palmer College of Chiropractic

Objective: To discuss the diagnosis and management of glioma as well as to note the importance of detecting increased intracranial pressure. **Clinical Features:** The patient sought care after experiencing 6 weeks of pain that would awaken her at night and which was accompanied by visual disturbances and daily headache. There were deficits found in cranial nerves II, III, IV, V, and VI. These findings, along with loss of spontaneous venous pulsations and early papilledema, prompted a decision to refer for emergency care. **Intervention and Outcome:** She was adamant that conservative management would be the best way to proceed. After further discussion and after reviewing probable differentials and potentially negative outcomes,

she reluctantly had emergency magnetic resonance imaging (MRI) of her brain. A tumor in her left carotid cavernous region was causing the cranial nerve findings. Also noted was a small homolateral supratentorial subdural hematoma. Surgical excision of the tumor and evacuation of the hematoma was performed. **Conclusion:** History and examination are important factors in determining the next step for evaluating patients with space-occupying lesions. MRI is seen as the most effective diagnostic tool in such cases. It is important to recognize the signs of increasing intracranial pressure, because this requires immediate referral for advanced medical care.

Cervical Spondylitic Myelopathy: A Case Report

Ron Boesch, James Owens, Steven Silverman, and Mary Klimek, Palmer College of Chiropractic

Background: Cervical spondylitic myelopathy (CSM) is the most common progressive spinal cord disorder in patients over 55 years old. Symptoms often develop insidiously and are mostly characterized by neck stiffness, arm pain, numbness in the hands, and weakness of the hands and legs. **Objective:** To discuss the diagnosis and management of cervical spondylitic myelopathy. **Clinical Features:** A 47-year-old man sought care for low back pain and bilateral lower limb weakness. He had been hanging drywall from a ladder, lost his balance, and to avoid falling jumped to the floor, landing on his feet. Four days later, he noticed a loss of leg strength. Two weeks later, he was seen in the authors'

clinic with similar complaints. Urinalysis was positive for hematuria; magnetic resonance imaging of the cervical and lumbar spine was ordered and subsequently confirmed the suspicion of CSM. **Intervention and Outcome:** The patient was referred for surgical consult. Surgical decompression was performed with subsequent improvement of neurologic and motor function. **Conclusion:** Because spondylosis is a common finding as patients age and may often lead to CSM, clinicians should recognize signs that may be present. Early detection may allow for conservative management; if not, surgical intervention may be warranted.

Research on the Effects of the Chiropractic Treatment on Individuals With Malocclusion as an Aid to the Orthodontic Treatment

Franciele Borili and Fabio Dal Bello, Private Practice

Introduction: Malocclusion is the second cause related to TMJ pain complaints. Improper occlusion and condylar position of the TMJ will provoke the individual's adaptation leading to dysfunctional symptomatology. Dental orthopedics/orthodontics is the conventional approach used to treat this condition. **Methods:** The patients of this study were referred for chiropractic treatment by their orthodontist before continuing with orthodontic treatment. All patients had a diagnosis of malocclusion and related TMJ pain. The orthodontist evaluated each individual before and after chiropractic treatment. To be able to evaluate the orthodontic professional's opinion about the effects of the chiropractic

treatment a satisfaction questionnaire was used. **Results:** The research showed that in 50% of the orthodontic cases there was a positive response in relation to the patient's occlusal condition. In 66% of the cases the orthodontist found a positive relationship with chiropractic treatment and the patient's reduced malocclusion. Lastly in 83% of the cases the orthodontist found that the chiropractic treatment was a positive tool to facilitate orthodontic treatment. **Conclusion:** The results suggest the chiropractic treatment when allied to the orthodontic professional could help facilitate improved patient outcomes and promote a greater quality of life to the individual with occlusion disorders.

Improving Student Performance in Radiology Courses Using Video Tutorials

Jill Bradshaw and Kathryn Hoiris, Life University

Purpose: This paper describes how video review instructional films were created for the students in a radiology course. **Introduction:** The reality of education has been staring us in the face for several years. The literature on the changing learning styles of the NeXt generation has invaded our space. **Methods:** The camera (Flip Video, Cisco Systems Inc, San Jose) was set in front of an x-ray enabling the instructor to identify structures and draw line analysis in a short and concise way on video. Then these videos were posted online to Blackboard and YouTube. IRB approval was obtained. **Results:** When the midterm exam

averages of other academic terms were compared, noting that the tests were of the same type, quality, and intensity, it was found that the mean scores improved after the videos were introduced. A student survey demonstrated satisfaction with videos. **Discussion:** Others in chiropractic education reported on changing their teaching methods and success in improving student learning, similar to the authors' findings of improved performance on the common course examination. **Conclusion:** It seems evident that teaching methods, with various formats and media, help students take responsibility for their learning.

Synovial Osteochondromatosis: A Case Report of the Knee Joint

Marni J. Capes and R. Bruce Fox, Life University

Purpose: This case report describes the clinical features and radiographic imaging for a 65-year-old female who complained of chronic intermittent right knee pain with occasional joint locking. **Introduction:** Synovial osteochondromatosis is a benign disease of unknown etiology that involves both articular and periarticular synovial membranes. This disorder has a slight male dominance and may be precipitated by trauma. The typical monoarticular process most commonly affects the knee, hip, ankle, and elbow in decreasing frequency. Of the reported cases, 50% to 70% involve the knee joint. **Clinical Features:** Pain, swelling, locking, clicking, decreased range of motion, and, occasionally, palpable loose bodies are found during examination. **Radiographic Findings:** Periarticular,

amorphous, well defined, calcific masses, measuring multiple centimeters, are characteristic of synovial osteochondromatosis. **Discussion:** Synovial osteochondromatosis should be included in the differential diagnosis for patients with knee pain and swelling when the working diagnosis remains unclear. Lack of awareness of this condition may lead to incorrect diagnoses and treatment. Malignant transformation to chondrosarcoma, although a rare occurrence with synovial osteochondromatosis, could be a dire unexpected outcome. **Conclusion:** The diagnosis of synovial osteochondromatosis should be included when patients present with knee pain and swelling of unclear origin.

Use of Web-Based Education for Training Clinical Research Staff

Mabel Chang and Jerrilyn Cambron, National University of Health Sciences

Introduction: The purpose of this paper is to detail the use of web-based learning as a tool to facilitate training of research personnel for a small case series study. **Methods:** All potential study personnel were given access to an e-learning platform (Moodle). A survey and quizzes were used to gain feedback about the success of the training. **Results:** Self-rated knowledge increased in areas where documents were accessed. All subjects found Moodle helpful and easy to use even though one person could not open one of the videos. **Discussion:** This survey found Moodle to be an effective

training resource for study personnel. Assessing literacy of the study protocol by testing is crucial. Contingencies must be made for technical difficulties. Tutorials may be helpful for users not familiar with Moodle. **Conclusion:** Web-based training for research staff is promising. Training can happen at anytime and anywhere with a web-connected computer. Research staff are able to learn at their own speed and access resources multiple times, and there are no travel costs or need to coordinate schedules. Web-based training can supplement or possibly replace live training in the future.

Chiropractic Management of Cycling-Induced Median and Ulnar Neuropathy

Richard Cole and Ron Boesch, Cole Pain Therapy Group

Cycling places an inordinate stress on the hands as they support the torso and may in fact cause damage to the median and ulnar nerves. This case report describes the chiropractic management of a patient suffering from traumatically induced bilateral median and ulnar nerve neuropathy.

Successful treatment included chiropractic manipulation and the use of physiological therapeutics over the cervical spine and wrists. The patient was pain free and returned to full function within 7 weeks. The relevant medical literature is reviewed with discussion of the diagnostic differentials.

Blood Pressure Changes in African American Patients Receiving Care From Chiropractic Interns: A Pilot Study

Rochelle Delain, Kimberly McMaster, Joe Wang, Jennifer York, and John Hart, Sherman College of Chiropractic

Introduction: There is a modicum of literature that shows blood pressure reductions following chiropractic care. This study focuses on patients from a single race who received care from chiropractic interns. **Methods:** The study was approved by the Institutional Review Board. Twenty-four African American patients received chiropractic care over a study period that spanned 23 visits for each patient. Inclusion criteria consisted of patients having a diagnosis of prehypertension (120–139/80–89) or hypertension stage 1 (140–159/90–99). The means of three baseline blood pressure readings (PRE) were compared to the means of blood pressure readings taken on visits 21, 22, and 23 (POST). **Results:** On average, blood pressure reductions were

observed for both systolic and diastolic blood pressures, though these reductions were not statistically significant (lowest p value = .078 for diastolic pressures). When four patients having body mass index (BMI) values that were considered as outliers were removed, a statistically significant decrease in diastolic blood pressure was observed (p = .004). Limitations of the study include a lack of control for confounding determinants such as diet and exercise. **Conclusion:** Blood pressures in this group of African American patients decreased following chiropractic care though not statistically significant until BMI outliers were removed.

A Rare Presentation to a Chiropractor of a Lisfranc Injury in an Athlete: A Case Report

Timothy Gooding and Joseph Forese, Life University

Objective: To discuss a case of an athlete with a Lisfranc injury of the left foot. **Clinical Features:** A 24-year-old rugby player with left foot pain and difficulty with weightbearing presented for a second opinion after being previously misdiagnosed following an injury sustained earlier that day. Based on the patient's subjective complaints and the authors' physical exam findings, radiographs were obtained to determine a clinical impression. **Intervention**

and Outcome: Radiographs revealed the presence of a severe Lisfranc injury. This diagnosis was confirmed by an orthopedic surgeon who immediately scheduled the patient for an open reduction and internal fixation procedure. The patient had a positive response to surgery and after a period of intense rehabilitation is recovering favorably. **Conclusions:** Although rare, Lisfranc injuries might be more prevalent than once thought. Most cases will present

in an emergency care setting, but the literature supports instances where they might be overlooked or misdiagnosed. As primary health care providers, this case illustrates the role that chiropractors can play in the detection of traumatically

induced foot injuries. It is vital that these injuries receive a timely and accurate diagnosis and intervention so as to avoid potential long-term complications including disability and morbidity.

Symptomatic Plantar Fibroma With Unique Sonographic Characteristics

Daniel Haun, John C.S. Cho, and Norman Kettner, Logan College of Chiropractic

Introduction: Plantar fibromatosis is a rare superficial mass typically located in the subcutaneous tissues of the plantar aspect of the foot. It is considered benign, but can be locally invasive. This paper presents a case of a large symptomatic plantar fibroma with unusual sonographic characteristics along with magnetic resonance imaging (MRI) and pathologic correlation. **Case Report:** A 25-year-old woman presented with a nonpainful but uncomfortable left foot mass that interfered with her gait. The mass was situated along the medial aspect of the arch of the left foot and was nontender to palpation. **Results:** Sonography demonstrated a well circumscribed, 32-mm × 27-mm × 14-

mm subcutaneous mass with heterogeneous echogenicity. The mass was comprised of both solid and small cystic components with intratumoral hypervascularity. MRI demonstrated homogeneously low signal intensity on T1 and heterogeneous but predominantly high signal intensity on T2-weighted and fat-saturated images. Surgical excision was favored and was performed without any complication. A pathologic diagnosis confirmed fibroma with myxoid degeneration. **Conclusion:** This paper presents a case of a solitary plantar fibroma with both characteristic and unique sonographic features. MRI and pathology confirmed the diagnosis of a benign plantar fibroma.

Postmigraine Chronic Daily Headache Relieved With Coccygeal and Sphenoidal Manipulation: A Case Report

Jerry Hochman, Life University

Introduction: This is a summary of the findings and possible anatomic and physiologic basis of successful chiropractic intervention on a patient with head pain of 7 years' duration. The pain had been diagnosed as migraine and trigeminal neuralgia and been previously treated pharmaceutically and physically, including with chiropractic. All previous treatments were unable to alleviate pain. **Case Report:** A 32-year-old male patient with a history of physical injury to both the coccyx area and the skull presented for care for chronic daily head pain of 7 years' duration.

Intervention: The coccyx and sphenoid were manipulated using diversified and sacro occipital technique procedures. **Discussion:** Possible reasons for success in treatment are offered, including mobilization of the sphenoid and coccyx, which may have affected the maxillary nerve. The propriospinal basis of the so-called Lovett brother arrangement is also discussed. **Conclusion:** Some cases of unsuccessfully treated head pain may be helped with cranial and/or coccyx manipulation.

Chiropractic Care for an Infant With Torticollis and Plagiocephaly: A Case Report

Kathryn Hoiriis, Life University

Introduction: Torticollis, head tilt to one side combined with rotation of the head to the opposite side, when noted at birth is called congenital muscular torticollis (CMT). In over 80% of these cases, plagiocephaly, a flattening of the contralateral skull, is also found. **Purpose:** This report describes the chiropractic management of an infant with CMT and plagiocephaly. **Case History and Examination:** A mother presented her 4-week-old infant with the complaint of difficulty turning his head to nurse. Clinical observation revealed left head tilt with right rotation and restricted passive motion in left rotation. **Intervention and Outcome:** Chiropractic management included cervical

adjustments and passive stretching combined with daily stretches at home. Evaluation at 5 months old showed resolution of restricted rotation and head tilt. **Discussion:** Torticollis may easily go unnoticed in the first 2 to 3 months. Plagiocephaly and torticollis found at birth could be the result of a limitation of the intrauterine space. For infants who do not present with plagiocephaly at birth, CMT may cause it. **Conclusion:** Milder cases of CMT may require only one or two chiropractic adjustments, whereas severe cases may require an increased frequency and duration to obtain the desired positive clinical outcome.

Reliability of the Blair Upper Cervical Radiographic Analysis for the Base Posterior View: A Feasibility Study

Todd Hubbard, Joel Pickar, Dana Lawrence, and Stephen Duray, Palmer College of Chiropractic

Introduction: This feasibility study was carried out to determine the inter- and intrarater reliability of chiropractors for Blair radiographic analysis, the number of radiographs that can be analyzed before fatigue affects the rater's ability to make reliable measurements, and the ease of using the authors' data collection instrument. **Methods:** Two chiropractors performed two readings of 24 base posterior radiographs. For the interrater and intrarater reliability of the radiographic analysis, the intraclass correlation coefficient (ICC) and random measurement error (RME) in degrees were determined. The level of fatigue was assessed with the Samn-Perelli fatigue and 100-mm drowsiness scales. **Results:** ICC for the left and right convergence

angles was 0.81 (RME +4.31°) and 0.85 (RME +4.38°), respectively. The ICC scores did not increase or decrease as the number of radiographs analyzed increased. The ICC scores and fatigue/drowsiness scales did not show a relationship using linear regression. **Conclusion:** This study presents preliminary evidence for the reliability of the Blair upper cervical chiropractic technique (BUCCT) protocols for analyzing the base posterior radiograph based on using raters novice in the use of BUCCT analysis. For a future study involving experienced BUCCT practitioners, a sample size of 42 radiographs would be used and require two 1-hour sessions per round of analysis.

Essential Tremor, Migraine, and Upper Cervical Chiropractic: A Case Report

Todd Hubbard and Janice Kane, Palmer College of Chiropractic

Objective: To describe the upper cervical chiropractic management of a 39-year-old female with essential tremors and migraine headaches. **Clinical Features:** A 39-year-old female had a 10-year history of essential tremors and a 20-year history of migraine headaches. **Intervention and Outcome:** The patient received high-velocity, low-amplitude (HVLA) chiropractic spinal manipulation to her upper cervical spine using the Blair upper cervical chiropractic technique protocol. There was improvement

in her tremors and migraine headaches following her initial chiropractic treatment, with a sustained improvement after 4 months of care. **Conclusion:** This case study demonstrated improvement in a woman suffering from essential tremors and migraine headaches. After she received upper cervical chiropractic manipulation, her symptoms were considerably reduced. This suggests the need for more research to examine how upper cervical specific chiropractic care may help mitigate tremors and migraine headaches.

The Accuracy of Kinesiology-Style Manual Muscle Testing: A Proposed Testing Protocol and Results From a Pilot Study

Anne Jensen, Timothy Kenealy, Joanna Stewart, Richard Stevens, and Amanda Burls, University of Oxford

Introduction: Manual muscle testing (MMT) is an assessment tool used by over a million practitioners worldwide, yet its accuracy has not been rigorously examined. While many applications of mmT exist, the aim of this paper is to outline a proposed methodology to investigate the accuracy of one specific application: to distinguish congruent from incongruent statements. **Methods:** Twelve practitioner–testee pairs were presented with visual stimuli about which testees made specific statements. Using 60 stimuli, practitioners muscle tested the testee's deltoid muscle immediately following the spoken statement to determine the testee's congruency. The reference standard is

the statement's verity. **Results:** The methodology was found to be useful in estimating mmT accuracy. Practitioners trained in mmT were found to be 67.7% accurate (95% CI 52.6%–82.8%), while those untrained were 51.7% accurate (95% CI 46.7%–56.7%). **Discussion:** Limitations of the protocol were presented and several recommendations were made to improve its rigorosity. Directions for future research are also discussed. **Conclusion:** Despite its prevalence, for mmT to be accepted into conventional use, rigorous studies of its accuracy are necessary. This protocol may serve to limit biased results.

Peroneus Digiti Quinti: Case Report and Literature Review

Everett Johnson and Bahram Sardarabadi, Parker College of Chiropractic

Introduction: Peroneus digiti quinti is one of many accessory peroneal muscles that may be found during routine dissection of the ankle and foot. Action of peroneus digiti quinti is described as being pronation. Innervation to peroneus digiti quinti has been reported as being through the superficial fibular nerve. **Methods/Results:** Peroneus digiti quinti muscle was bilaterally in a 64-year-old female cadaver during dissection of the leg and foot. The muscles arose from the tendon of the peroneus brevis muscle at the lateral malleolus and extended distally toward the fifth digit, where it blended with the dorsal aponeurosis of the fifth digit.

Discussion: Few studies have focused on the peroneus digiti quinti alone. The peroneus digiti quinti has a prevalence in the population ranging from 15% to 36%. Many authors report that the variation of peroneal musculature may be atavistic structures, as they are found in aneuploid neonates and monkeys. **Conclusion:** Clinicians should be aware of these accessory muscles for determining proper clinical diagnosis of lateral ankle and foot complaints. Further studies should be performed to determine exactly how much peroneus digit quinti influences pronation and any clinical relevance.

A Case Study Utilizing Vojta/Dynamic Neuromuscular Stabilization Therapy to Control Symptoms of a Chronic Migraine Sufferer

Dave Juehring, Palmer Chiropractic College Davenport

Introduction: This case report demonstrated the reduction of a 49-year-old female's chronic migraine symptoms treated with 12 weeks of Vojta/ Dynamic Neuromuscular Stabilization (DNS) therapy. **Methods:** Daily Vojta/DNS treatment occurred either in the office or at home over a 12-week period. Symptoms were tracked via a patient diary, a pain scale, and a Headache Disability Index. **Results:** Symptoms consisted of intense headaches, light sensitivity, vision disturbances, vomiting, and fatigue, all lasting commonly 3 days, 8 to 10 times per month. After a 12-week clinical trial, subjective improvements were noted with a

reduction of symptom frequency to one to two times per month, lasting at most 12 hours in duration with a reduction in intensity from consistent maximums of a 10 to a 2 on a pain scale. Headache Disability Index scores dropped from 48% to 34%. **Discussion:** This therapy reduced the patient's migraine symptoms consistently in frequency, duration, and intensity. This therapy is not well known in North America despite its use for over 40 years in Europe. **Conclusion:** This case demonstrated that Vojta/DNS treatment over the course of 12 weeks helped manage the patient's migraines and could be a possible treatment option for future research.

Creating a Structured Chiropractic Experience for Medical Students Visiting the Texas Chiropractic College

Rahim Karim, Victor Benavides, and Al Adams, Texas Chiropractic College

Introduction: Texas Chiropractic College (TCC) is part of the Baylor College of Medicine's (BCM) Longitudinal Ambulatory Care Experience program, an outpatient preceptorship with community exposure for 3rd-year medical students. In this program, medical students visit TCC during the academic year. A structured chiropractic experience was created for these visits. The following objectives were established by BCM in consult with TCC for their students: to identify educational requirements for chiropractors, to identify conditions commonly treated by chiropractors, and to outline appropriate referrals to chiropractors. **Methods:** A formal agenda was created for the medical student visit. They were initially given a

presentation on the chiropractic profession and provided with relevant literature. The students were then assigned to chiropractic clinicians and their interns to observe patient care. Medical students had an opportunity to discuss aspects of chiropractic care and patient management. **Results:** In 2010, TCC hosted three groups of medical students. Informal feedback received from BCM was positive and the visit was felt by the medical students to be a great learning experience. Similarly, informal feedback from our interns revealed that they were excited about interacting with medical students. **Conclusion:** The authors feel that the above experience is a positive step in structuring an interprofessional education experience among TCC and BCM students.

Utilization of Vascular Restriction Training in Postsurgical Anterior Cruciate Ligament Rehabilitation: A Case Report, Introduction to a Novel Training Stimulus, and Review of a Proposed Mechanism

Peter Lejkowski and Jason Pajaczowski, Canadian Memorial Chiropractic College

Background: The restoration of muscle function, strength, and size following injury or orthopaedic surgery is vital for proper recovery. This premise has been emphasized in knee injury or postsurgical anterior cruciate ligament (ACL) reconstruction cases. Due to the impaired state of the lower limb, the recommendation for high-intensity exercise in order to efficiently gain strength and muscle size is not possible. **Objective:** To introduce a new training technique, utilizing a vascular restriction stimulus during low-intensity rehabilitative exercise and to provide a case example within a postsurgical rehabilitation scenario. A brief review of the most commonly reported mechanism of action

behind the purported success of the training stimulus is included. **Methods:** A 19-year-old athlete presented for an accelerated ACL rehabilitation program following surgical reconstruction of her ACL. She received a commonly utilized rehabilitation program that was supplemented with vascular restriction stimulus. The goals were prevention of atrophy and rapid return to function. **Results:** The patient maintained muscle cross-sectional area and had improved function at a 12-week follow-up. **Conclusion:** Low-intensity exercise supplemented with vascular restriction may prove to be an efficient and effective means at maintaining postsurgical muscle structure and subjective and knee function.

Effects of Delisting of Chiropractic Services From Ontario Health Insurance Plan on Chiropractors' Income and Patient Volume and Perceived Impact on the Profession's Credibility: A Random Sample of Toronto Chiropractors

Matthew Longo, Jesse Chappas, Mike Grabowski, Crystal Jakym, and Brian Gleberzon, Canadian Memorial Chiropractic College

Objective: The purpose of this project was to determine the effect that delisting of chiropractic services from the Ontario Health Insurance Plan (OHIP) had on a random sample of Canadian chiropractors. **Methods:** A survey was mailed to 199 random chiropractors practicing in Canada. **Results:** The average number of years in practice among the 123 respondents (response rate of 61.8%) was 13.5 years. Among those chiropractors in practice during OHIP coverage ($n = 92$), 45 indicated their practice was negatively affected and 47 indicated it was not, and roughly half of chiropractors who experienced a decline in practice volume reported their patient volume had recovered. Fifty-three

chiropractors were in favor of the OHIP being reinstated, whereas 62 were not, and 64 respondents perceived that OHIP delisting took away from the credibility of the profession, while 58 respondents did not. These numbers were higher among those chiropractors who never practiced during OHIP coverage. **Conclusion:** More than half of respondents perceived that the delisting of OHIP coverage had a negative impact on the profession's credibility, and roughly half of those chiropractors who were in practice under OHIP coverage reported that their practice income was negatively affected by it initially. Despite these findings, 53.9% of chiropractors did not want OHIP reinstated.

Chiropractic and the Community: Finding Grant Opportunities to Promote an Outreach Clinic

Cynthia Lund and Marquette Brown, Life University

Introduction: Finding opportunities for grants has become an ongoing effort for this university. A prospect researcher tracks potential sources, cultivating relationships and following up with managers of various foundations. This paper narrates the process, logistics, and results of a university's first-time attempt to obtain money from a grant to advertise and promote its free community outreach clinics. **Background:** Online searches produced a potential match of the university's outreach clinics' intentions to help the indigent and working poor and provide free health evaluations, chiropractic care, and other support

services, with the directives of the Ida A. Ryan Trust, which include selecting and helping charitable institutions such as community funds and hospitals. **Methods and Results:** The administrators of the clinic and the prospect researcher created a budget, wrote and submitted a proposal, and defined the parameters of use for the \$10,000 award received. The funding paid for a bulk mailing, booklets and rack cards, a patient appreciation event, electronics for community health screenings, and several promotional items. The process moved smoothly, with very good results of moving usage of the clinics from a nongrowth mode to 100% capacity.

In Vitro Cytotoxicity Studies of Fluorescent Carbon Nanoparticles

Pengju Luo, Li Cao, Ya-Ping Sun, and Jun Luo, Sherman College of Chiropractic

Introduction: As a new type of bright fluorescent nanomaterials, carbon nanoparticles have great potential in biological applications. However, it is imperative to study their toxicity before fluorescent carbon nanoparticles could be utilized in biology and medicine. This research evaluated the cellular toxicity of the fluorescent carbon nanoparticles. **Methods:** Two cell lines (MCF-7 and HT-29) were used in the cytotoxicity assays of both “naked” carbon nanoparticles (precursor, no surface passivation) and carbon nanoparticles of different surface functionalities (carbon dots). Trypan blue assay and MTT assay were performed; cell proliferation, mortality, and viability were studied.

Results: No significant toxic effects have been found for the components from which carbon dots are constructed and also for carbon dots in various compositions and configurations. On the PPEI-EI-functionalized carbon dots, some cytotoxic effects at concentrations beyond a threshold were observed in this study. **Discussion:** To the authors’ best knowledge, this is the first report in the literature to systemically assess the biocompatibility of carbon dots and their precursors in addressing the biosafety concerns. The noncytotoxicity of the precursor carbon nanoparticles should also ease concerns on the potential defunctionalization of carbon dots to result in the core carbon nanoparticles being exposed.

Allowing a Possible Margin of Error When Assessing Student Skills in Spinous Process Location

Cheneir Mboge and John Hart, Sherman College of Chiropractic

Introduction: When testing students on the location of vertebral spinous processes, faculty examiners may wish to allow for a margin of error that is often observed between experienced examiners. This study attempts to quantify such a margin of error. **Methods:** The study was approved by the Institutional Review Board at Sherman College of Chiropractic. Two faculty clinicians independently palpated spinous processes at four different vertebral levels (C2, T3, T9, and L2) on 18 student volunteers. A cloth tape was affixed paraspinally on each volunteer. Once the examiner located the spinous process, the corresponding number to the nearest 1/8 of an inch was noted. Differences between examiners for each vertebral level were calculated.

Results: Differences between examiners increased caudally, with the following differences plus one standard deviation: C2, 0.24 inches; T3, 0.93 inches; T9, 1.32 inches; and L2, 1.38 inches. **Discussion:** These findings suggest that faculty examiners may wish to consider applying a margin of error when assessing students’ skills in locating a particular spinous process. **Conclusion:** In this study, differences between examiners plus one standard deviation ranged from 0.24 for C2 to 1.38 for L2. The concept of margin of error should be considered by faculty examiners when assessing the skill of students in locating the spinous process of various vertebral levels.

Sacro Occipital Technique Treatment of Hiatal (Hiatus) Hernia Presentation: A Case Report

Gary Mitchell and Charles Blum, Sacro Occipital Technique Organization–USA

Introduction: A hiatal hernia (HH) is the protrusion of the upper part of the stomach into the thorax through a tear or weakness in the diaphragm. Chiropractic techniques such as sacro occipital technique (SOT) have some specific methods to conservatively treat gastroesophageal reflux and HH symptoms. **Case Report:** A 54-year-old male patient presented with severe pain in the epigastric area which worsened with deep breathing, eating any food, and sensations of unremitting persistent upper abdominal aching. The condition had persisted for 3 days before he sought treatment. **Intervention:** Treatment involved adjusting T11–12 “anteriorities,” releasing of diaphragmatic tension, SOT, chiropractic manipulative reflex technique (CMRT), HH release technique (gently pulling stomach downwards during exhalation), and solar plexus technique.

Results: Immediately upon pulling the stomach downward the patient sighed and said he could breathe comfortably for the first time in 3 days. Approximately 2 minutes following the adjustment he reported the constant tension in the epigastric region was gone. At 3-, 6-, and 12-month follow-ups, the patient indicated no reoccurrence or residual discomforts. **Discussion:** In health care, risk–benefit ratios need to be applied so that most conservative care such as chiropractic treatment for HH may offer a viable alternative. **Conclusion:** SOT-CMRT has multiple methods for treating HH and this could offer an excellent opportunity for interdisciplinary treatment of HH between the fields of chiropractic and allopathic gastroenterology. Future research should involve determining which subset of patients could benefit from chiropractic care of HH symptomatology.

Chronic Postpartum Osteitis Pubis Managed With Chiropractic

Linda Mullin and Bobby Fano, Life University

Introduction: This case report describes a 32-year-old female who was referred to a chiropractic office with MRI-confirmed pregnancy-induced osteitis pubis of 2 years' duration. The patient was unable to walk unassisted due to pain. While osteitis pubis is well documented in athletes with repetitive use injuries that are healed with rest, the literature does not discuss chronic postpartum osteitis pubis that remains unresolved after rest. **Methods:** Initial treatment of chiropractic adjustments utilizing contact-specific, high-velocity, low-amplitude adjustments (ie, Gonstead technique) were applied to sites of pelvic subluxations with mild improvement. Strengthening exercises to the abdominal

and contralateral adductor muscles were used as adjunct therapy to stabilize the pubic symphysis. **Discussion:** Pregnancy creates unique structural stresses to the female body. In the three joint complex of the pelvis, asymmetry of movement can create excessive instability in other parts of the complex. Adjustments serve to normalize motions and remove these stresses. In this chronic case, the addition of strengthening exercises provided complete restoration of symmetry and resolution of pubic pain. **Conclusions:** After failed conventional care of rest and orthopedic supports, chiropractic adjustments and therapeutic exercise resolved the patient's pain and normalized her functional ability.

Chiropractic Biophysics Technique Helps 8-Year-Old Male With Chronic Headaches, Sore Throat, Fatigue, Dizziness, Queasiness, and Cervical Subluxation: A Case Report

Paul Oakley, Stephanie Chaney, and Tom Chaney, Innovative Chiropractic Centre

Objective: To describe the outcome of the use of chiropractic biophysics (CBP) technique on an 8-year-old with chronic headaches, sore throat, fatigue, dizziness, queasiness, and an S-shaped cervical spine. **Clinical Features:** An 8-year-old male presented with chronic headaches for 2 years. He also suffered from sore throat, fatigue, queasiness, aches, pains, and dizziness. He had been seen by a neurologist, psychologist, and nutritionist with limited health improvements. Cervical spine radiographs revealed an S-shaped neck (upper kyphosis, lower hyperlordosis). **Intervention and Outcome:** The boy was treated with CBP mirror-image isokinetic exercises, postural adjustments, and cervical spine extension traction. Spinal manipulation,

cervical mobilization, and hydrotherapy were also provided. A lateral cervical radiograph taken 6 months postcare revealed a near normal curve for his age. Concurrently, all symptoms had dissipated and the boy was placed on maintenance care. **Conclusion:** This case presented the successful outcome in an 8-year-old with a variety of health issues as well as headaches. This case and others suggest that CBP cervical extension traction as well as manipulation may be a safe and effective intervention for the pediatric headache. Further research is needed to determine what subset of pediatric patients presenting with headaches may be best suited for structure-based chiropractic care.

Do Occupational Safety Regulations Protect Hospitality Workers From Secondhand Smoke? A Review

Catherine O'Neill, Life University

Background: Secondhand smoke (SHS) is a proven public health hazard and has been linked to increases in morbidity and mortality in nonsmokers. Workers in hospitality industries are regularly exposed to SHS in the workplace, creating concern regarding what is considered unsafe in the workplace and raising the issue of whether government intervention is necessary. **Purpose:** An investigation was done to examine the hazards of SHS to workers and to determine if the government agencies that control public health and workplace safety exert any regulations over SHS. **Scope/Method:** A review of literature was performed to determine the objective and subjective results of SHS

exposure, the financial and public health effects of smoking bans, and government policies regarding worker safety and public health. **Conclusions:** Hospitality workers exposed to SHS in the workplace are at an increased risk of lung and other cancers and heart disease and experience decreased cardiorespiratory and immune responses. Smoking bans have proven effective in reducing exposure to SHS and associated health effects, without affecting profits. Organizations promoting public health concur that SHS poses a significant workplace health risk, to which the Occupational Safety and Health Administration has failed to respond accordingly to protect workers.

Alzheimer's Disease, Olfactory Dysfunction, and Chiropractic Care: A Case Report

Patricia Pilling, Life University

Objective: To present the effects of chiropractic care on olfactory dysfunction in an Alzheimer's disease (AD) patient. **Clinical Features:** The patient is a 77-year-old housewife and mother of five children who was diagnosed with AD 3 years ago. She started chiropractic care for relief of back pain, as well as upper and lower extremity pain. The patient had not been tested for olfactory dysfunction and had not noted any change in olfactory sensation prior to testing. **Intervention and Outcomes:** Olfactory testing and stimulation using a number of odorants was presented randomly to both nostrils for 5 seconds during 22 random

visits over a 3-month period. Chiropractic adjustments using a specific, high-velocity, low-amplitude mechanical force, manually assisted technique (Activator Methods Chiropractic Technique) were performed each visit prior to the olfactory testing and stimulation. The patient is able to detect the odorants, differentiate one odorant from another, and describe the odorants now. **Conclusions:** The results of this case report indicate that chiropractic care along with olfactory stimulation may enhance olfaction in regards to the detection, discrimination, and description of odorants in an AD patient.

Severe Chronic Asthma: Chiropractic Care in a Pediatric Case

Robert Rectenwald, Life University, College of Chiropractic

Objective: To discuss the chiropractic care of a 23-month-old child with the diagnosis of severe chronic asthma. **Background:** Asthma is the most common chronic illness in the pediatric population. It affects 7 million people per year in America between the age of 5 and 14. Severe asthma is a diagnosis given to patients with any combination of chronic symptoms, acute severe exacerbations, and persistent airflow limitations, despite the prescription of multiple therapies. **Clinical Features:** This patient began experiencing symptoms at age 9 months. By age 18 months

he had been treated four times at the hospital emergency room for episodes of acute respiratory distress. He suffered from constant wheezing and cough. **Intervention and Outcome:** Adjustments of the cervical spine utilizing orthospinology technique were performed over a 7-month period. After 9 weeks there were no further episodes of breathing difficulty reported. **Conclusion:** The results in this case support the use of chiropractic care for infants with asthma symptoms who have not responded to standard pharmacological treatment.

Chiropractic Care of Pediatric Nonmusculoskeletal Conditions: A Case Series

Martin Rosen and Charles Blum, Sacro Occipital Technique Organization-USA

Introduction: This paper attempts to facilitate a glimpse into a chiropractic clinical practitioner's office where nonmusculoskeletal conditions are routinely being treated. **Methods:** As standard practice of this office, an active group of pediatric patients (2000–2007, $n = 127$) were sent a questionnaire via the mail. For the purposes of this case series, children treated for nonmusculoskeletal symptoms ($n = 37$) out of those who responded to the questionnaire were used for this case series. All pediatric patients were treated by the same clinician utilizing sacro occipital technique and cranial pediatric treatments. **Results:** 65/127 parents responded from our standard follow-up outreach and 37/65 were treated for nonmusculoskeletal presentations. Of the

37 nonmusculoskeletal pediatric patients, five were treated for immune dysfunction, seven for developmental delays/dysfunction, nine for birth trauma, one for seizure activity, four for learning problems, three for endocrine problems, three for migraines, two for gastrointestinal issues, two for fussiness/agitation/anxiety, and one for enuresis. **Discussion:** Developing a pediatric chiropractic evidence base for practicing doctors should start with expanding the doctor's knowledge of pediatric diagnosis and treatment options. **Conclusion:** To build a representative evidence base it is essential that research into chiropractic treatment of nonmusculoskeletal conditions incorporates successful chiropractic clinical practices treating this subset of pediatric patient.

A Pilot Program of Chiropractic and Acupuncture Treatment for HMO Seniors With Low Back Pain Who Have Experienced Poor Response to Medical Care

Mike Sackett, Kevin Rose, and Stanley Ewald, Southern California University of Health Sciences

Introduction: The college recently contracted with a senior HMO to provide chiropractic and acupuncture treatments for their patients with low back pain (LBP) who have had poor results with medication and physical therapy. The goal of the program is to provide relief for their LBP and measure its cost-effectiveness. **Methods:** The seniors were referred for an initial six visits. Additional visits were authorized with the appropriate documentation supporting the need for the care. Patient status reports were completed by the seniors documenting their perceived improvement with care. IRB approval was obtained. **Results:** From October 2009 to the

end of July 2010, 476 new patients were seen. Of those, 277 received at least five visits and filled out a patient status report. The average improvement was 48%. **Discussion:** Overall the short-term LBP relief of these seniors was good. The HMO made the decision to pay for maintenance care to allow the patients to maintain their level of improvement. **Conclusions:** Chiropractic and/or acupuncture care seems to be of benefit for seniors with LBP who have had a poor response to traditional medical care. Further studies need to be conducted to measure the long-term effectiveness.

Report of Anatomical Variation of the Azygos Venous System in the Posterior Thoracic Wall: Implication to Chiropractic Imaging

Bahram Sardarabadi and Everett Johnson, Parker College of Chiropractic

Background: A great number of diversities of the azygos venous system occur due to the embryonic development of the azygos vein system from the subcardinal veins. These variations have been reported as early as 1849. Studies have shown that development of the subcardinal veins during the fetal stage of life can be grouped into five different configurations of the azygos venous system. The least common variant of the azygos venous system is the preaortic interazygos, occurring at a frequency of 3.05%. **Methods and Results:** The dissection of the posterior mediastinum is a routine procedure in dissection in the Gross Human Anatomy laboratory at a chiropractic college. In a 58-year-

old female cadaver, the preaortic interazygos venous system was noted. The preaortic interazygos is located at sixth thoracic vertebrae. **Discussion/Conclusions:** Both computed tomography (CT) and magnetic resonance imaging (MRI) are important tools used frequently in chiropractic diagnosis and treatment. It has been documented that CT and MRI studies of the preaortic interazygos venous system can be easily mistaken for enlarged lymphatic node, aneurysms, and tumors. Care must be taken during surgical procedures as not to cause intraoperative bleeding by accidental damage to the azygos venous system.

Temporal-Occipital Cranial Strain: A Case of Pediatric Stuttering

Suzanne Seekins, Stephane Provencher, and Joseph F. Unger, Jr., Sacro Occipital Research Society International

Background: A 7-year-old male with stuttering, poor social interactions, poor pronunciation, and a diagnosis of autism spectrum disorder presented seeking a second opinion. The child had no physical trauma, no family history of stuttering, and no significant birth trauma, and had been undergoing speech therapy for a year. **Methods:** Chiropractic craniopathy assessment was performed and revealed a cranial strain and loss of normal motion. Sacro occipital technique (SOT) chiropractic category II pelvic blocking for sacroiliac hypermobility syndrome and spinal adjustments were also performed. A specific cranial procedure, described by Dr. Jarrette as Area 3 Spread, was utilized with cerebrospinal fluid directed to Broca's motor

area of speech. **Results:** The mother noted a 50% to 75% improvement of the stuttering symptoms after the first treatment. Then, following an motor vehicle accident, seven additional treatments were required to return the child to the preinjury status with little to no stuttering or stammering. At 3 months posttreatment, the child continued 95%+ improved in coordination and development. **Conclusions:** This case report demonstrates the plausibility that a cranial strain might have adversely affected this patient's language skill and development. Greater research study is needed to determine if the findings in this one report can offer options for other children with similar types of presentations.

Chiropractic Technique: A Survey of Faculty Perception of Student Extracurricular Participation

David Sikorski, Anupama Kizhakkeveetil, and Gene Tobias, Southern California University of Health Sciences

Introduction: Our study evaluates faculty opinions regarding the influences of students' participation in extracurricular technique activities on their future chiropractic technique preferences. **Methods:** An anonymous and voluntary survey of DC faculty was conducted. **Results:** Faculty preferred Diversified technique as their current practice preference over any other technique system. Faculty agreed that preclinical chiropractic technique education has the greatest influence on students' future chiropractic technique preferences, followed by outside practicing chiropractors, extracurricular technique seminars, and extracurricular technique clubs. These results were similar among faculty across departments. **Discussion and Conclusion:** Faculty have similar preferences for their current chiropractic practice techniques as reported by the

NBCE Job Analysis Survey of 2005, and the students' survey results regarding their future practice technique preferences. Faculty survey results indicate chiropractic preclinical technique education as the greatest influence on students' future practice technique preferences, thereby supporting the authors' hypothesis that faculty would appreciate the value of curricular technique activities more than the value of extracurricular activities. Principles and Practice Department and Clinical Internship faculty value chiropractic preclinical technique education more than other influences on students' future practice technique preferences, thereby supporting the hypothesis that both clinical and preclinical faculty would equally value curricular technique education over extracurricular experiences.

A Study Into the Role of Psychosocial Factors on the Prevalence of Musculoskeletal Disorders in the Workplace

Gill Smith and Christina Cunliffe, McTimoney College of Chiropractic

Rationale: Perceived work stress and job satisfaction can affect the incidence of musculoskeletal disorders (MSDs), the amount of sick leave taken, and "return-to-work" rates. **Objectives:** To investigate the relationship between perceived psychosocial work environments and the prevalence of MSDs and associated sick leave. **Methods:** After IRB/ethical approval, a semistructured survey was designed and piloted for content and face validity before modification and distribution to 605 office workers in a large consulting and business services group. Data were collected via an online survey. **Results:** A total of 311 responses were received, representing a 51.8% response rate. A total of 86.2% (268) of respondents reported to have

suffered with an MSD at some point, with 21.6% (58) having resultant sickness absence. Psychosocial environment scoring showed a generally positive perception but there was no significant difference between groups that have or have not suffered with an MSD ($p = .736$) or that are or are not currently suffering ($p = .506$). A marginally significant association was determined when comparing groups that have or have not taken MSD-related sick leave ($p = .059$). **Conclusion:** Psychosocial environments may affect an employee's decision to take sick leave. The study may have been influenced by the low physical demand on employees and a supportive management style.

Faculty Attitudes Toward Health Care Professions Derived From Eastern and Western Medical Traditions

Gene Tobias, Anupama Kizhakkeveetil, and David Sikorski, Southern California University of Health Sciences

Purpose: To determine faculty attitudes regarding chiropractic (DC) and acupuncture and Oriental medicine (AOM) professions. **Introduction:** A goal of this institution is to integrate DC and AOM programs at the levels of basic sciences, clinical sciences, and clinical practice. There is lack of literature about the integration between these two programs. The issues addressed in this study were preprofessional education, scope of practice and primary care status, and commonly treated conditions. **Methods:** An anonymous survey was conducted among the faculty. **Results:** AOM and DC faculty and preclinical and clinical

faculty had different opinions about students' preprofessional education, the professions' scope of practice and primary care status, and the kinds of conditions treated by AOM and DC practitioners. **Discussion and Conclusions:** Faculty attitudes about the AOM and DC professions were similar to students' attitudes previously studied (ACC RAC 2010). The differences in attitudes between AOM and DC faculty and between preclinical and clinical faculty may reflect the level of integration between the two professions and the differences in teaching roles.

Comanagement of Dystocia Resulting in a Normal Delivery: A Case Report

Mary Unger-Boyd, Joseph Unger, Jr., and Stephane Provencher, Logan University, SORSI

Purpose: This study reports a case of successful comanagement by a chiropractic physician and a certified professional midwife (CPM) of a woman in labor with dystocia. **Case Presentation:** A 37-year-old grand multipara woman at 38 weeks labored 21 hours with 2-cm dilation. Manual vaginal examination by a CPM showed an anterior shift of cervix position close to the pubis. Chiropractic evaluation found a right anterior-inferior sacrum, round ligament, and abdominal fascial restrictions. **Interventions/Outcome:** A sacral adjustment utilizing Logan Basic Technique, Webster Technique, and pelvic floor fascial release was performed. Immediate reexamination by the CPM

showed a centrally positioned cervix. A maternity support belt was provided and worn through the night. Reevaluation by the CPM the next morning found unchanged cervix position. Labor began and progressed to an uncomplicated LOA water birth with stage 1 of 2 hours 35 minutes and stage 2 of 1 minute. **Conclusion:** This case report illustrates the successful cooperative management between a CPM and chiropractic resulting in the favorable outcome for the patient. Another study suggests the effectiveness of cotreatment during dystocia and chiropractic effectiveness. It suggests the need for more investigations to determine the value of future collaborations.

Retrospective Study to Determine Variability in Patient Repositioning Precision in Pre/Post Nasium Films as a Function of National Upper Cervical Chiropractic Association Practitioner Experience

David Vazquez, Dale Johnson, and Alexandra Weibel, Life Chiropractic College West

Introduction: Precision in patient positioning repeatability is a prominent issue concerning the accuracy of the radiographic evidence for corrections of upper cervical spine misalignments seen in pre/post National Upper Cervical Chiropractic Association (NUCCA) x-rays. The primary objective of this pilot study was to gather samples of retrospective pre/post x-rays representing three cohorts of NUCCA practitioners to assess the variability in patient repositioning precision. **Methods:** This IRB-approved study applied a computer-assisted method to measure the skeletal displacement between pre- and post-nasium films in blinded sets gathered from student-clinic files (10 sets), three uncertified NUCCA doctors (5 sets each), and one

fully certified NUCCA doctor (10 sets). **Results:** Two separately blinded analyses yielded the following results: for student interns, the mean skeletal displacements are $16.28 \text{ mm} \pm 11.13 \text{ mm}$ and $17.01 \text{ mm} \pm 11.02 \text{ mm}$; for uncertified NUCCA doctors, $14.24 \text{ mm} \pm 10.90 \text{ mm}$ and $13.94 \text{ mm} \pm 10.95$; and for the fully certified NUCCA doctor, $9.33 \text{ mm} \pm 6.86 \text{ mm}$ and $9.44 \text{ mm} \pm 7.16 \text{ mm}$ for the first and second analyses, respectively. **Discussion/Conclusion:** It is not known whether these variability values support claims that upper cervical realignments as seen on postcorrection films are accurate or simply due to a difference in patient positioning.

Chiropractic Care of a Geriatric Patient With Klippel-Feil: A Case Report

William Vicory, Life University

Objective: To present the effects of chiropractic care using Activator for a patient having Klippel-Feil syndrome with difficult ambulation. **Clinical Features:** A 73-year-old female was having difficulty ambulating after a recent hospital and nursing home stay for pneumonia due to congestive heart failure. Unable to walk without the assistance of a walker, she experienced weakness and fatigue in her legs. Radiographs and palpation revealed congenital block vertebrae, an omovertebral bone, and Sprengel's deformity, in addition to scoliosis, moderate degenerative changes, and decreased range of motion. **Intervention and Outcomes:** Digital palpation and leg length analysis were employed to

determine spinal and articular subluxations and myofascial trigger points. Five months of conservative chiropractic care using an Activator Adjusting Instrument plus home balance and mobilization exercises were incorporated. The patient's symptoms were reduced plus ambulation without support, walking without stopping, and balancing on single leg with fingertip support were achieved. **Conclusion:** Through 5 months of conservative chiropractic care, the patient continues to demonstrate better mobility and balance. The results suggest that chiropractic care using Activator can facilitate ambulation and balance, reducing the potential for falls and injury.

Supine Leg Check Reliability Pilot Study

H. Charles Woodfield III, B. Burt Gerstman, Renate Henry Olaisen, and Dale F. Johnson, Upper Cervical Research Foundation

Introduction: There has been little investigation into examiner reliability of the supine leg check (SLC) interpreted as a positive predictor of Atlas misalignment by orthogonal-based upper cervical chiropractic procedures. The significance of performing the SLC relies on a doctor's ability to perceive the presence of inequality, above or below a threshold cut point where a clinical decision is made. It is essential to determine the extent to which independent examiners agree on the side and extent of leg length inequalities (LLI) to bring credence to SLC use. **Methods:** Fifty healthy volunteers were assessed by experienced independent examiners in separate closed rooms. Examiners were blinded of their peer's assessment

and order of subject assessment was determined randomly. Data were double entered and validated to quantify interexaminer reliability. **Results:** Data restricted to subjects with inequality of at least 1/8 inch ($n = 39$), observed by both examiners, showed overall agreement of 73% ($\hat{\kappa} = 0.46$; 95% confidence interval = 0.19–0.73). Observed inequality of 1/4 inch and above revealed overall agreement of 100%. Assuming an underlying $\hat{\kappa}$ of 0.45, with a margin of error of 0.10, future investigation requires 358 observations. **Discussion and Conclusion:** This pilot study allowed refinement of research questions, investigatory techniques, and sample size requirements for a larger SLC reliability investigation.

Effects of Low-Force Chiropractic Adjustments on 24-Hour Heart Rate Variability and Low Back Pain

John Zhang, Patrick Montgomery, and Rodger Tepe, Logan College of Chiropractic

Objective: This study reports the effects of low-force chiropractic adjustments (LFCAs) on 24-hour heart rate variability (HRV), Quad Visual Analogue Pain Scale (QVAS), and Oswestry Disability Questionnaire (ODQ) measurements on two patients with low back pain (LBP). **Methods:** This study was approved by a chiropractic college Institutional Review Board. Two consenting volunteers with LBP received LFCAs two times per week for 4 weeks. Outcome measures were taken before the first and after the last treatment. **Results:** The first patient had

increases in 24-hour HRV high frequency (HF) (from 6253 to 12,838 ms^2/Hz and total power (TP) (from 16,416 to 28,970 ms^2/Hz), and decreases in QVAS (from 6 to 3) and ODQ (from 10 to 4). The second patient had increases in 24-hour HRV HF (from 2329 to 2686 ms^2/Hz) and TP (from 8919 to 9811 ms^2/Hz), and decreases in QVAS (from 6 to 2) and ODQ (from 15 to 5). **Conclusion:** After 4 weeks of LFCAs, both patients showed improvement (increases) in 24-hour HRV TP and HF and improvement (decreases) in QVAS and ODQ.