ABSTRACTS OF ACC CONFERENCE PROCEEDINGS

Poster Presentations

Educators' influence on tomorrow's leaders: health-care perspectives of 3rd year chiropractic and medical students

Victor Benavides, David Schimp, Greg Turpin, Texas Chiropractic College

Introduction: Chiropractic educators can influence the profession's leadership by understanding viewpoints of students who will assume the leadership role. Appreciating student perspectives on education and health care will guide educators to influence outcomes of future health-care leaders. **Methods:** Thirty-three 3rd-year medical and chiropractic students were voluntarily asked to complete an anonymous 35-question survey. The questionnaire, which was similar to a leadership instrument, relates to educational and health-care perspectives. **Results:** Responses were separated into 5 perspectives: (1) educational experience, (2) relative value of chiropractic, (3) ethics, (4) life decisions, and (5) health-care collaboration and community. Results demonstrated common similarities as well as differing views. **Discussion:** The limitations of this study include the small sample size and the limited number of institutions represented. The findings may not represent the perspectives of the broader population. The findings are insightful for chiropractic institutions to extrapolate information. **Conclusion:** The next generation of health-care leaders share similar perspectives on the value of chiropractic services, ethics, health-care careers, and integrated collaboration. Educators should consider developing enduring mentorships to enhance the student's educational experience. (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.)

SOT chiropractic and acupuncture for SLAP tear: a case report

Christine Benner, Charles Blum, Sacro Occipital Technique Organization

Introduction: While arthroscopic surgery is a common occurrence with SLAP lesions, the purpose of this paper was to investigate whether conservative care, which utilized sacro occipital technique (SOT) chiropractic care and acupuncture, could facilitate recovery of a patient presenting with a SLAP lesion. **Case History:** A 42-year-old man, in good overall health, injured his right shoulder while doing boxing training on an "upper-cut bag." A magnetic resonance imaging (MRI) scan was done, revealing a SLAP tear, which was unresponsive to prior conservative care interventions for 8-months. **Methods/Intervention:** Chiropractic SOT and acupuncture were instituted to treat kinematic chain asymmetry and improve shoulder healing. **Results:** By the first treatment, an immediate improvement in range of motion and a substantial decrease in pain were found. Following 5 visits over a 2-month period of time, the patient was able to return to prior boxing training and had full shoulder
strength and flexibility. **Conclusion:** The chronicity of the patient's symptoms, over 8 months, and the temporal relationship between treatment and response to care is of interest. Research should be taken to evaluate whether a subset of patients may be better suited for this alternative method of care or whether this case was an anomaly. (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.)

Strategies and barriers to chiropractic students achieving career success

Mary Berg, Northwestern Health Sciences University

Introduction: A literature review of strategies and barriers to chiropractic students achieving career success was conducted 2012. **Methods:** The following questions were asked: What strategies are effective in advising chiropractic students for career success? What curricular strategies, resources, and student support services help students to assess themselves to plan and achieve a successful career after graduation? What barriers need to be overcome? The publications searched included PubMed, Index to Chiropractic Literature, ELMN, and ERIC. The search terms used were as follows: career advice and chiropractic, career advice and medicine, chiropractic and success, vocational guidance, professional development, and business management. **Results:** Twelve research articles were pulled for in-depth review. The studies recom-

mended that more research be conducted; a standardized curriculum be created; chiropractic clinics be vetted for job shadowing; business classes be created to discuss the risks of purchasing a practice; more instruction be given in the areas of insurance, billing, management, and marketing; internships with a business focus be established, expanded, or both; post-graduate training in business be offered; and a chiropractic-wide business education program be developed. **Discussion:** Based on evidence, plans to change or enhance curricular offerings were made. **Conclusions:** More research is needed 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.)

Knowledge retention in a multi-generational chiropractic college setting

Lisa K. Bloom, New York Chiropractic College

Introduction: This paper addresses the importance of knowledge transfer between multi-generational faculty members as it relates to knowledge retention, brand identity, and effective leadership. **Discussion:** The key to knowledge transfer and brand identity is mentorship at the level of the college faculty, and new faculty need to be hired before retiring faculty leave the institution. However, generational preferences, work ethic, and communication styles can create a conflicting landscape that complicates knowledge transfer and ultimately compromises brand identity. **Conclusion:** Formulating strategies that address generational differences and support knowledge retention between outgoing senior faculty members and new faculty members will ultimately preserve brand identity and support the continuing growth and development of a chiropractic college. (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 use among runners: a pilot study

Heidi Bonderud, D'Youville College

Introduction: Runners encounter numerous muscle imbalances and injuries. They have several medical professionals to choose from in order to heal. This study was to see when and how runners use chiropractors. **Methods:** The survey was posted at www.buffalorunners.com for 2 weeks. The survey was analyzed for main responses using SPSS software. Responses to categorical data were organized in tables allowing for identification of major categories. Percentages were used to help highlight the main responses. A χ^2 test was done to see if there was any statistical correlation between weekly mileage and chiropractic use. **Results:** There were 37 participants. One did not complete the survey. Fifty percent of the participants had seen a chiropractor for a running complaint. Sixteen had received relief through chiropractic care. Owing to the small sample size, there was no significance in the data. **Conclusion:** It is recommended that the study be redone with a larger sample size that includes runners from around the United States. (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 intervention of Zenker's diverticulum: a case report

William Boro, Sacro Occipital Technique Organization

Introduction: Zenker's diverticulum (ZD) is a blind sac (pouch) that branches off the esophagus at the upper esophageal sphincter. While surgery is a common treatment for ZD, the purpose of this paper was to investigate whether Sacro Occipital Technique (SOT) chiropractic care and soft tissue therapies could facilitate recovery of a patient. **Methods/Intervention:** A 71-year-old man, 6-ft 1-in tall, weighing 191 lb, presented at this office with chief complaint of difficulty swallowing, associated with coughing when swallowing, and a diagnosis of ZD. Treatment utilized DeJarnette's sutural protocol, adjustment to the cervical spine (cervical stairstep), shoulder girdle, category 2 block placement, lumbar adjustment, soft tissue release to the pharynx/larynx area, and modified Van Rumpt hiatal hernia release. **Results:** Four treatments were given over a period of 2 weeks. Symptoms were improved after the 1st treatment and significantly by the 2nd treatment. Between the 2nd- and 3rd-treatment session, the patient underwent a laryngoscopy and was told that the ZD was not of sufficient size as to require surgery. **Conclusion:** While there have been no studies reported utilizing conservative chiropractic methods and the treatment of ZD, it appears that such treatment in some instances may provide therapeutic benefit to those suffering from this disorder. (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.)

Geometry of coplanar stereoscopic radiographic pairs for analysis of the lateral cervical radiograph: a study using mathematical models

Lafayette Briggs, Sherman College of Chiropractic

Introduction: Accuracy of radiographic findings is an important aspect in chiropractic, particularly with some approaches that measure in millimeters. Three-dimensional (3-D) assessments of points of interest on a phantom replica of the human skull and cervical vertebrae were evaluated in this study in an attempt to better understand how structures are represented in space using mathematical methods. **Methods:** Three basic geometric equations derived from the "Law of Similar Triangles" are introduced, and measurements are taken after 4 trials to demonstrate how 3-D data extracted from 2-dimensional (2-D) digitized radiographic pairs can be utilized to produce coordinate points associated with 3 areas on the atlas. **Results:** An

analysis of variance (ANOVA) test for multiple group comparison showed no significant statistical difference between 4 trials ($p = .995$). In addition, 6 strong positive correlations are evident using Pearson's product-moment coefficient test ($r = 0.9008–0.9977$, $p = .002$). **Conclusion:** It is possible to use coplanar stereoscopic radiographic pairs to define an object's location in 3-D space by taking retrospective measurements directly from 2-D digitized radiographs. (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.)

Musculoskeletal complaints: prevalence among workers in a hotel of Serra Gaucha

Mariana Cardoso da Silva, Marcia Augusta Basso de Alexandre, Luis Henrique Colombo

Introduction: This study aimed to verify the prevalence of musculoskeletal complaints among workers in a hotel in "Serra Gaucha." **Methods:** The sample was composed of 32 employees of a hotel. It was found that 53.1% of the sample was male, and 59.4% have worked in the hotel from 1 to 3 years. **Results:** In the last 12 months, the prevalence of musculoskeletal complaints was in the back and in the last 7 days in the lower back. Few workers needed to get away from their usual activities because of lower back pain. The job function with the highest prevalence of complaints was the maid, in which the main affected region was the lower back. Workers who had been employed for 1 to 3 years had the most complaints, with prevalence in the ankles, feet, or both. Most workers have a workday of 8 hours. Those with a longer workday of 10 hours had complaints in the neck and back. **Conclusion:** It is suggested that further studies be made in this area using different methodologies, so that policies can be pursued to promote workers' health, improve their quality of life, and increase their productivity. (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 Achilles tendinopathy through chiropractic adjustments and physiotherapy

Roxanne Caron, Richard Dry, Life University

Introduction: A 37-year-old man, who was a graduate student and amateur martial artist, presented with lower left leg pain. Through chiropractic evaluation and analysis, it was determined that the patient had bilateral tendinopathy of the Achilles tendon, a cervical and lumbar vertebral subluxation complex, and abnormal posture. **Methods:** Toggle adjustments were performed once a week for 3 months without impacting the patient's pain and lower leg dysfunction. A physiotherapy regimen consisting of low-level laser therapy (LLLT), whole body vibration therapy (WBVT), and cross-fiber friction therapy along with the chiropractic adjustments was instituted during the 4th month of care with a favorable outcome. **Results:** The patient had complete resolution of pain and dysfunction in 4 months from the institution of the chiropractic and adjunctive care. **Discussion:** Personal bias of the student clinician delayed the treatment of this condition. The combination of chiropractic care and these therapies would seem to be an effective treatment for Achilles tendinopathy. **Conclusion:** This case demonstrates that conservative, subluxation-based chiropractic care, supplemented by physiotherapy consisting of LLLT, WBVT, and cross-fiber friction therapy proved to be beneficial in the management of Achilles tendinopathy. (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 correlation between plantar pressure and low back pain: evaluation by digital foot scanner

HyeRin Cho, Hanseo University, HanSuk Jung, Hanseo University, JooHyun Ham, Hanseo University, SungEun Kim, Hanseo University, Naoko Tanimoto, Hanseo University, Barry Draper, Royal Melbourne Institute of Technology

Introduction: The pathology of low back pain (LBP) is anatomically and functionally related with the postural balance. Thus, it is surmised that foot plantar pressure is important in such balance. In this study, we investigated the correlation between plantar pressure and LBP. **Methods:** A total 125 college students (50 male students and 75 female students, aged from 20 to 29 years) participated in this study. Based on pain scale, groups were divided into 2: control group ($n = 27$) and LBP group ($n = 98$). The foot plantar pressures were measured by 2 examiners. **Results:** For measurements of the left foot, intraclass correlation coefficient (ICC 3,1) was 0.75, and ICC 3,1 for the right was 0.75. The Pearson coefficient between the pain scale and the index values of plantar foot pressure was 0.469 ($p < .000$). **Discussion:** In the present study, the reliability of 2 examiners using Associate Platinum V7+ Digital foot scanner was fairly good. A significant correlation was found between pain scale and index values of plantar foot pressure. **Conclusion:** These results suggested that the measurement of plantar pressure using Associate Platinum V7+ Digital foot scanner might be a helpful method for examining 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.)

The effect of chiropractic manipulation and mobilization on auditory acuity

JinOk Choi, HanSeo University, HanSuk Jung, HanSeo University, JooHyun Ham, HanSeo University, SungEun Kim, HanSeo University, Naoko Tanimoto, HanSeo University, Barry Cecil Draper, Royal Melbourne Institute of Technology

Introduction: Hearing loss occurs when there is a problem with one or more parts of the ear or ears. This study investigated the effects of chiropractic manipulative therapy and mobilization on auditory of the young. **Methods:** Twenty-seven subjects with

average age 20.9 years (18 men and 9 women) participated in this study. Subjects were divided into 2 groups: chiropractic manipulation–treated group ($n = 17$) and mobilization-treated group ($n = 10$). The Automated Micro Audiometer–Pure Tone Audiometry (Earlogic, Seoul, Korea) was used for auditory measurement at pre- and posttreatments. **Results:** At pretreatment, all subjects showed normal hearing at most of hearing frequencies in both ears, except 250 Hz. Both groups showed mild hearing loss of the left ear at 250 Hz before chiropractic manipulation and mobilization. However, chiropractic manipulation and mobilization significantly reduced the decibels of hearing loss (dB HL) to the normal hearing level. **Conclusion:** In the present study, chiropractic manipulation and mobilization reduced the dB HL at all ranges of hearing frequency in both ears of the young. These results support that chiropractic manipulation and mobilization may have beneficial effects on auditory acuity of the young. (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 musculoskeletal complaints among workers in an industry metal mechanics of Porto Alegre

Luis Henrique Colombo, Marcia Augusta Basso de Alexandre

Introduction: The general objective was to verify the prevalence of musculoskeletal complaints among workers in the metal mechanics industry. **Methods:** The sample included 226 workers: 214 men and 12 women (average age, 29.7 years and 26 years, respectively). **Results:** Eighty-five percent of workers had 1 to 5 years experience in the job. Daily work duration consisted of 8 hours and 48 minutes, with 3 breaks for rest and meals. Among the 226 workers, 52.65% didn't conduct caster, and only 1.33% responded that they don't work overtime. Regarding musculoskeletal complaints, it was verified that in the last 12 months, and in the last 7 days, they were prevalent on the lumbar spine (60.18%) and knees (67.70%), respectively, but the complaint that caused workers to depart from their habitual daily activities in the last 12 months struck, mainly, the hip region (74.34%). It was observed that the grievance on the lumbar spine in the last 12 months is related to the time in the job. **Conclusion:** Based on these data, a considerable significance can be observed in the musculoskeletal complaints submitted by the interviewed workers. (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.)

Capsaicin-induced central sensitization is associated with central features of the fear-avoidance model

Stephan Cooper, Mark Pfefer, Cleveland Chiropractic College

Introduction: There is compelling evidence that the transition from acute to chronic pain involves a complex combination of cognitive, psychosocial, and neurophysiological factors. The objective of this study was to identify relationships between scores obtained on psychosocial surveys central to the Fear-Avoidance Model and central sensitization operationalized as brush allodynia score (BA). **Methods:** Following Institutional Review Board approval, 76 participants were enrolled in this trial. Participants were given a psychosocial survey battery composed of elements within the Fear-Avoidance Model, then they underwent a central sensitization procedure to evoke cutaneous brush allodynia and a BA was obtained. A 2nd survey battery was completed during the experimental procedures. Survey scores were compared with BA to identify correlations. **Results:** A significant positive correlation (Spearman's) was found between BA and hypervigilance (PVAQ) ($\rho = 0.256$, $n = 76$, $p = .026$ and $\rho = 0.254$, $n = 76$, $p = .027$). A negative correlation was found with catastrophizing ($\rho = -0.337$, $n = 38$, $p = .038$). **Conclusion:** This study demonstrated a small but significant positive correlation between a neurophysiological component and psychosocial components of the biopsychosocial model. Unexpectedly, a negative correlation was found between BA and catastrophizing in a centrally sensitized cohort. Further research is required to corroborate these 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.)

Capsaicin-induced central sensitization is associated with increased myofascial pain sensitivity in healthy participants

Stephan Cooper, Mark Pfefer, Cleveland Chiropractic College

Introduction: Although an association between myofascial trigger points and central sensitization has been demonstrated, direct causation has not yet been shown. It is unclear whether myofascial pain causes central sensitization, central sensitization causes myofascial pain, both central sensitization and myofascial pain are reciprocally causal, or both are caused by a 3rd yet unknown factor. **Objective:** The objective of this study was to assess whether central sensitization, induced by insult to a neuromerically related but distant site and measured with brush allodynia, can affect muscle pressure pain sensitivity in healthy, trigger-point free participants. **Methods:** A between-groups and within-groups experimental design was used to compare measures of pressure pain threshold of the infraspinatus muscles in sensitized and nonsensitized conditions among 81 participants. **Results:** Significantly decreased pressure pain thresholds in the test-side infraspinatus muscles of the test group but not in the control group or neurologically distant infraspinatus muscle corroborates the initiation of myofascial pain sensitivity by induction of central sensitization in the absence of myofascial pathophysiology. **Conclusion:** As this study was performed on asymptomatic, healthy participants,

in the absence of myofascial pathophysiology, it suggests a causal relationship between central sensitization and myofascial pain pathogenesis. (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.)

Overactive bladder in association with symphysis pubis subluxation: a novel mechanical approach

Robert Cooperstein, Palmer College of Chiropractic–San Jose, Anthony Lisi, VA Connecticut Health-Care System, Andrew Burd, Palmer College of Chiropractic–San Jose

Introduction: At least 33 million Americans suffer from overactive bladder (OAB), characterized by urinary frequency, urgency, and/or urge incontinence. Many or most cases are idiopathic. Current medical treatments, pharmacologic and other, tend to be ineffective. **Methods:** This is a case report of a 24-year-old nulliparous female patient with idiopathic OAB, with primarily nocturnal polyuria. History and medical examination was noncontributory, and medical care had failed. Sleep was limited to 2 consecutive hours owing to bladder urgency. On physical examination, a 6-mm vertical offset of the pubic bones at the symphysis pubis was observed. The patient was treated with a novel side-posture drop table move, deploying a superior to inferior thrust on iliac crest. **Results:** Receiving 2 adjustments per week for 1 month, gradual realignment of the symphysis was associated with reduced nocturnal polyuria, with gradual increase in consecutive sleep hours from 2 to 7, which was maintained for over a year. **Discussion:** This case of successful resolution of OAB with symphysis manipulation suggests there may be a somatovisceral reflex due to shared innervation of bladder and symphysis. **Conclusion:** OAB is amenable to manual treatment directed at pelvic structures, including dysfunctional symphysis pubis. (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 soft tissue mobilization techniques in a chiropractic college teaching clinic

Dwain Daniel, Stefanie Coforio, Michael Ramcharan, Texas Chiropractic College

Introduction: Soft tissue mobilization techniques (STMT) are commonly utilized within the chiropractic profession. The purpose of this study is to report utilization of STMT in a chiropractic teaching clinic. **Methods:** This is a retrospective review of patient charts from an outpatient clinic at a chiropractic teaching institution over a 1-year period of patients billed for manual therapy. This project was approved by the college institutional review board. **Results:** There was no clear preference in utilization of 1 technique over any other. STMT is utilized less on the low-back patient (28.50%) than on the cervical/upper thoracic patient (42.5%). **Discussion:** The data collected in this study reflect the lack of randomized controlled trials performed that test the effectiveness or dose response of many of the named techniques. There does not appear to be any clear utilization trend beyond regions treated. **Conclusion:** Developers of techniques should take the responsibility to test their concepts and report the results in the scientific literature. This process would demonstrate efficacy and cost-effectiveness of specific techniques. (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.)

How do you assess cocurriculars? an assessment framework part and parcel for institutional effectiveness

Dustin Derby, Palmer College of Chiropractic

The impact of students' learning and growth outside the classroom has been documented for several decades. As state and federal fiscal budgets tighten, and college tuitions rise year after year, students and parents demand accountancy for the money they pay. The accountancy of students learning and other activities outside the classroom, while important to students and parents, is a primary concern of all 6 US accrediting agencies by way of institutional effectiveness. The systematic process and structure used by colleges to determine not only the quality of its students but also the quality of its academic programs' administrative functions and support services is known as institutional effectiveness. Accounting for students' experiences outside the classroom is but one of several pieces of institutional effectiveness. The purpose of this presentation is to deliver a comprehensive, evidence-based framework for the assessment of extra- and cocurricular programming, as well as to provide templates for constructing assessment plans and reporting end-of-term assessment results. (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.)

Extracting information from visually identified points on Excel plots

James DeVocht, Palmer College of Chiropractic

Introduction: Microsoft Excel is widely available and is often used to display plots of data. Macros can be written in Excel to identify obvious points on a plot, such as a peak, and values can be extracted at that point. However, more subtle events, such as the beginning of a peak, often need to be located by visual inspection. It is not obvious how to get a macro to extract the value of such visually identified points. **Methods:** Markers can be created as 2-point plots in addition to a plot of data. Those markers can be moved by manual interaction with the macro through the use of the UserForm capability that is built into Excel. Once a marker is manually placed at the point of a desired event, the user can indicate on a UserForm that

it is in the correct position. The macro can then extract and automatically use the value of the data at that point. **Discussion:** Commercially available software designed specifically for data processing is expensive and may not be warranted if it would not be used very often. **Conclusion:** Macros in Excel provide adequate capability for many data processing needs. (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.)

Evaluating the experience and educational training of chiropractic interns on breaking bad news to patients

Steve Dyess, Michael Ramcharan, Texas Chiropractic College

Objective: The aim of the study was to explore the experience and educational training of chiropractic interns in relation to breaking bad news to patients. **Methods:** A qualitative survey was performed in the Moody Health Clinic in 2012. A cross-sectional study was conducted using a 7-item questionnaire administered to interns within the clinic system at Texas Chiropractic College. **Results:** A total of 66 chiropractic interns participated in the survey. Twenty-four percent of interns indicated they had had experience in giving a person bad news prior to attending this chiropractic college. Forty-one percent reported they had received training in giving bad news during their outpatient clinic training or experience. Twenty-four percent strongly agreed and 66% agreed that they could present a patient with bad news. Twenty-one percent strongly agreed and 56% agreed that they could confidently present bad news to a patient. Twenty-three percent strongly agreed and 20% agreed they needed instruction or training in presenting bad news to a patient. **Conclusion:** This cross-sectional study concluded that chiropractic interns had limited experience and educational training in relation to breaking bad news to 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.)

Patellar dislocation: a case report

Dennis Enix, Logan University, Kasey Sudkamp, Logan University, Aaron Welk, Logan University, Robbyn Keating, Logan University, Frank Scali, American University of the Caribbean School of Medicine

Introduction: Patellar dislocation is a common knee injury, and the treatment protocol varies depending on the degree of structural damage. This case study presents the diagnosis and treatment of a dislocated patella in Thailand, China, and in the United States. **Methods:** Magnetic resonance imaging and diagnostic ultrasound was performed at 4 weeks and 4 months, respectively. The patient's continuum of care was examined as her treatment spanned multiple countries. A subjective and objective evaluation occurred at 4 months after the initial injury. **Results:** Diagnostic imaging ruled out abnormalities to the cruciate ligaments and menisci; however, osseous contusions and injury to the medial patellofemoral ligament were identified. Deviations from standard treatment and rehab protocol were noted, and limitations in functional recovery were still present at 4 months. **Discussion:** Multiple previous studies have looked at operative versus nonoperative treatment results in lateral patellar dislocations. The length of time immobilized, bracing methods, and start of rehabilitation all have an effect on patient recovery. **Conclusion:** Management of first-time lateral patellar dislocation varies, affecting the time table and success rate of recovery. (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.)

Neuroplasticity in action: rehabilitation of chronic ABI symptoms using a chiropractic functional neurologic approach

Susan Esposito, Kelli McLaughlin, Life University

Objective: The purpose of this study is to demonstrate the use of chiropractic functional neurology brain-based therapies to effectively treat a patient with persistent neurologic symptoms following an acquired brain injury (ABI). **Clinical Features:** A 42-year-old female patient presented to a chiropractic functional neurology clinic with 5 years of persistent neurologic symptoms following several traumatic and nontraumatic brain injuries. The clinical impression was brain injury presenting as a centrally maintained vestibular syndrome and frontal lobe syndrome with right cervical dystonia and associated anxiety and dysautonomia. **Methods and Results:** Interventions included gaze-stability exercises, vestibular stimulation, right cerebellar–left cortical neuraxis stimulation, and breathing exercises. The patient improved significantly in balance, oculomotor function, gait, cognition, sensation, and motor coordination. She also showed decrease myoclonus, head pain and pressure, and dizziness. **Conclusion:** This case suggests that chiropractic functional neurology brain-based therapies can be an effective conservative treatment for patients with persistent neurologic deficits following ABI. (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.)

Usage of outcome measurements in chiropractic care

Vivi-Ann Fischer, Tabatha Erck, Chiropractic Care of Minnesota, Inc

Introduction: Independent research supports chiropractic as the entry point for back and neck pain care, and a quality chiropractic treatment model must utilize outcome data. Study goals included validating that (1) chiropractors use outcome tools, can obtain measurable data, and are able to communicate the data; and (2) identify effective strategies that improve the quality and

value of care that lead to creating Chiropractic Centers of Excellence. **Methods:** Outcome surveys were implemented collecting data from doctors and their patients. A 2nd survey queried the experience of chiropractors and staff involved in the study. **Results:** Outcome survey goals were validated. Experience survey results indicated an administrative burden on chiropractors' offices and a lack of patient engagement. **Discussion:** Both surveys were completed successfully and supported designing and implementing Chiropractic Centers of Excellence with a doctor of chiropractic as the first-line treatment for back and neck pain. Improved collection, reporting, and integrating of outcomes in the treatment process requires additional research and development to fully utilize outcome data. **Conclusion:** Chiropractors and staff can collect outcome data and share results with an outside organization. More research is warranted, as is the development of efficient outcome collection tools. (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 intern attitudes, beliefs, and intentions with regard to health promotion, wellness, and preventive services

Stephen Grand, Kenice Grand, Rod Floyd, Shane Carter, Palmer College of Chiropractic Florida

Introduction: There is disagreement concerning meaning, applicability, and actual employment of these health words. Generally, medical care focuses on external interventions to treat diseases; chiropractic focuses on treating dysfunctions from a physiologic perspective. **Methods:** Independent persons surveyed 3 groups of interns both before and after a short program of educational interventions by their mentors. **Results:** The interns initially favored wellness models, perceived a need for them, and felt partially prepared to administer them. Afterward, they reported some benefit from this short course of training. **Discussion:** Literature supported this need and some prior success in academic models. The College supported this pilot program, and the interns seemed generally engaged in it. The surveys demonstrated a perception of improved preparedness for wellness counseling by interns. **Conclusion:** These interns understood the value of additional training to provide wellness care for clinic patients and their own future patients. Limitations were noted; for example, more education is needed and better logistics to overcome the limitations noted. This program indicates the need for further development. (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.)

Can vegans have healthy bones?

Kenice Grand, Stephen Grand, Palmer Chiropractic College–Florida

Introduction: Osteoporosis is a pervasive disease with a high price tag. Over 200 million people worldwide have the disease. Major health initiatives include recommendations for dairy products. Some Americans choose vegan diets in order to decrease the risk of chronic degenerative diseases. Chiropractic physicians offer dietary advice to their patients. This paper explores whether or not a vegan diet is a prudent recommendation for healthy bones. **Methods:** Literature search was performed using various databases. Search terms included osteoporosis, vegan, vegetarian, protein, and calcium. **Results:** People on vegan diets are at risk for deficiencies in protein, calcium, and vitamin D3. Dairy products are a common source of calcium in the American diet. The relationship between vegan diets, bone loss, and fracture rates has been equivocal. **Discussion:** The 3 primary nutrients that are at risk for deficiency in a vegan diet as it relates to bone health are protein, calcium, and vitamin D3. It is possible to supply all 3 through a well-planned vegan diet. **Conclusion:** It is possible for vegan diets to support healthy bones. Chiropractic physicians are well equipped to offer nutritional advice to their vegan 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.)

Comparison of chiropractic student scores before and after utilizing formative assessments in a laboratory skill course

Joseph Guagliardo, Life University

Introduction: The literature on best practices in higher education indicates that students need frequent opportunities for feedback to see improvement in learning. The purpose of this paper is to report the differences in laboratory examination scores achieved by students after formative assessments were added to an introductory chiropractic clinical skills course. **Methods:** A retrospective comparison of student performances over 6 academic sessions was approved by the institutional review board for human subjects ($n = 624$). Comparison was made of students' scores before ($n = 327$) and after ($n = 297$) formative assessments were added. Statistical analyses in addition to mean and median scores included a 2-tailed independent t test, 1-way analysis of variance (ANOVA), Tukey's honestly significant difference (HSD) and Cohen's d. **Results:** Students performed better in the group with the formative assessment. The 2-tailed independent t test with equal variances was significant between the 2 groups ($t = -3.570$, $p < .001$), Tukey's HSD identified that the subgroups were homogenous, and finally Cohen's d was calculated to be $d = 0.226$ demonstrating a small to medium effect. **Conclusion:** This report suggests that formative assessments should be encouraged in this course in the future as the group who received these assessments performed better than the group without the assessments. (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.)

Cultural competency in chiropractic education

Karin Hammerich, Canadian Memorial Chiropractic College

Introduction: North America comprises a large number of different cultures that impact patient demographics and the health-care providers that serve them. However, multicultural education in the curricula of chiropractic colleges is inadequate. This absence suggests that new graduates are not well equipped in cultural competency to treat patients in a diverse sociocultural setting. **Methods:** A literature review was performed and revealed that most of the research on the subject has been conducted in nursing and medicine. That research suggests that educational interventions can be effective in enhancing clinical services. This paper examines the need for education in cultural competency in chiropractic from the perspective of the educational setting. It provides a theoretical framework for strategies to be included in multicultural education as well as suggestions for their implementation. The terms and concepts associated with multiculturalism are also discussed. **Results and Conclusions:** Educators and institutions need to demonstrate leadership in using sound educational theory in order to adequately create a learner-centered syllabus, which will address cultural competency training. (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.)

Balo's concentric sclerosis: case study of a conservative treatment approach

Adam Harcourt, Dale Johnson, Life Chiropractic College West

Objective: This case study outlines a conservative course of management and treatment for a patient diagnosed with Balo's Concentric Sclerosis (BCS). **Clinical Features:** The patient presented 3 years after initial diagnosis of BCS with right hemiparesis, constant fatigue, and dizziness. **Outcome Measures:** Visual Analog Scales (VAS), General Pain Disability Index (GPDI), and magnetic resonance imaging (MRI) scans were used to evaluate the effects of care. Monitoring the patient's Romberg's, touch localization, and finger-to-nose tests was used during each visit to assess the patient's progression. **Intervention:** Spinal manipulative therapy (SMT), neurologic exercises, nutritional changes, and supplementation were all used in the treatment of this patient. SMT began approximately 2 weeks before the nutritional intervention began. **Outcome:** The patient's fatigue and dizziness completely resolved, and the hemiparesis decreased from 7 of 10 to 1 of 10, and she reported that she was regaining the ability to distinguish different textures with her right hand. **Conclusion:** Conservative management should be considered for BCS as an initial course of treatment owing to the relatively low risk of side effects and successful treatment of 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.)

Association of hypertension mortality rates with geographic concentrations of chiropractors and medical doctors in the US, 2008

John Hart, Sherman College of Chiropractic

Introduction: This ecologic study compares hypertension mortality rates in the US to concentrations of chiropractors (DC) and medical doctors (MD). **Methods:** Concentrations of DCs and MDs in 2007 were compared with 2008 hypertension (essential hypertension and hypertensive renal disease) death rates using Spearman correlation analysis and linear regression. **Results:** DC concentrations revealed a stronger beneficial correlation with hypertension death rates ($r = -0.430$, $p = .0020$) compared with MD concentrations ($r = -0.029$, $p = .8$). A regression coefficient of -0.9 was observed for DC concentrations (95% confidence interval [CI], -1.4 to -0.4; $t = -3.45$, $p = .001$). Thus, for every average increase of one DC per 10,000 population nationally (within the range of these data, which was 1.0 to 5.2 DCs per 10,000 population), a corresponding average national decrease of approximately 1 death per 100,000 population is expected. **Discussion:** Limitations to the study include its ecologic design. Since this is an observational study, causal inference is not claimed. **Conclusion:** In this study, DC concentrations showed a stronger beneficial correlation with reduced hypertension mortality rates compared with MD concentrations. Further research with other designs is required to verify the validity of these 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.)

Comparison of resting pulse rates in chiropractic students versus the general population

John Hart, Sherman College of Chiropractic

Introduction: The present study compares resting pulse rate (RPR) measurements between a small group of chiropractic student-patients (CSP) and a similar group from the general population. **Methods:** The study was approved by the institutional review board. RPR data from a convenience sample of 17 CSP were compared with a reference group from the general population. Both groups consisted of young, adult, white men and were compared using a 2-sample t test and effect size. **Results:** The CSP group had a mean RPR of 65.2 beats per minute (bpm) compared with the general population group whose mean RPR was 71 bpm, a difference that was statistically significant ($p = .0097$) with a low-to-medium effect size of 0.39. **Discussion:** Factors other than chiropractic care could be the reason for the lower pulse rate in this sample of chiropractic students. **Conclusion:** This group of CSP had a lower average RPR compared with their reference group. Further

study with random sampling and an accounting of potential confounders such as physical fitness 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.)

Management of postpartum coccydynia with chiropractic

Nicholas Hathaway, Linda Mullin, Life University

Objective: The purpose of this study is to describe the successful treatment of a patient with postpartum coccydynia with chiropractic adjustments and muscle therapy. **Clinical Features:** A 31-year-old postpartum woman was referred by her midwife to a chiropractic office for evaluation and management of coccygeal pain. The pain, which limited all of her activities of daily living, began the day following the vaginal delivery of her son 6 weeks earlier. **Intervention and Outcomes:** The patient's left sacroiliac joint was adjusted with a Gonstead side posture technique along with massage and stretch of the left inferior gluteus maximus at the origin near the lateral coccygeal borders. Within 1 treatment, the pain had diminished by 60% and was fully resolved within 1 week. **Conclusion:** Chiropractic may provide a safe, effective management option for certain types of postpartum coccydynia. This case had full resolution after 1 week of sacroiliac joint adjusting and muscle stretch. (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.)

Head repositioning accuracy: is there a difference in outcome measures when using active head displacement compared with passive head displacement

Paul Holmes, Gay Swait, Adrian Hunnisett, Christina Cunliffe, McTimoney College of Chiropractic

Introduction: To investigate whether there is a difference in head repositioning accuracy (HRA) scores when comparing passive head/neck displacement to active head/neck displacement using a methodology commonly employed to analyze cervical proprioception. **Methods:** Following ethical approval, a within-subjects p-test using 25 asymptomatic participants from a chiropractic college student base was performed. HRA in both passive and active head/neck displacement was analyzed using a laser device in an adaptation of previous methodology. The results were analyzed statistically using the Friedman test with posttest calculations. **Results:** Results indicated that there were no significant differences between passive and active head/neck displacement when comparing all outcome groups with both root mean square error (RMSE) and variable error (VE). **Conclusion:** It is theorized that active displacement activates the cognitive feedforward model of motor efference copy (MEC), while passive displacement relies on proprioceptive feedback. Differences between active and passive HRA scores could have been explained by the phenomenon of MEC. However, these findings suggest that HRA is not dependent on MEC, or that other systems are able to fully compensate for HRA in the absence of MEC. (This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)

Correlation between the fossa temperature difference and the Blair upper cervical atlas misalignment

Todd Hubbard, Palmer College of Chiropractic, Kali Gillen, private practice

Objective: To determine the correlation between the atlas fossa temperature difference (AFTD) and the atlas misalignment determined by the Blair upper cervical radiographic analysis. **Methods:** Patients at the Palmer Academic Health Center (AHC), who were scheduled to have Blair upper cervical radiographs taken, were asked to participate in this study by having their atlas fossa temperature difference taken using the TyTron C3000. The AFTD was then compared with the Blair radiographic atlas listing. **Results:** Nineteen subjects' data were calculated for correlation between the AFTD and misalignment laterality or AFTD and misalignment seen on the radiograph. The Phi coefficient for the AFTD compared with the atlas laterality showed a poor correlation of 0.267 (95% confidence interval [CI], −0. 272 to 0.686), with a $\chi^2 = 1.351$; $df = 1$, and $p = .245$. The Phi coefficient for the AFTD compared with the side of misalignment seen on the radiograph also showed a poor correlation of 0.156 (95% CI, −0.366 to 0.616) with a $\chi^2 = 0.460$; $df = 1$, and $p = .498$. **Conclusion:** There was no statistical significance found for the poor correlation between the AFTD and the atlas misalignment or the ADTF and the side of misalignment seen on the Blair radiograph. (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 chiropractic treatment of medial tibial stress syndrome in 2 female high-school cross-country runners: a case series

Laura L. Huber, Marni J. Capes, Life University

Introduction: This paper reports the effectiveness of chiropractic adjustments for the talocrural joint dysfunction and the treatment of Medial Tibial Stress Syndrome (MTSS) in two female high-school cross-country runners. **Methods:** Examination of 2 female cross-country runners with bilateral leg pain revealed tenderness at the posterior, medial aspect of the legs. Pain was measured at 7 of 10 and 10 of 10 using the numerical pain scale (NPS) in both patients. A reduction in passive dorsiflexion and forced plantar flexion of the ankle was noted. Anterior to posterior talus adjustments were administered to the talocrural joint. Informed consents were obtained. **Results:** The

results were reduced pain to 0 of 10 and 1 of 10 on the NPS and increased ankle range of motion. **Discussion:** Abnormal range of motion in the ankle joint can result in compensatory changes throughout the kinetic chain affecting tissue and gait cycle. The goals were to alleviate pain, improve function, and return the athlete to normal physical activities. **Conclusion:** Chiropractic treatment of MTSS was effective, although certain limitations exist within this study. This retrospective case series can act as a guide and suggest to other chiropractors that additional research is needed in this arena. (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.)

Axillary arch muscle: a case report of the variation of the Arch of Langer

Everett Johnson, Bahram Sardarabadi, Parker University

Introduction: The axillary arch muscle is known to be an abnormal attachment of some parts of the latissimus dorsi muscle. It has been reported to occur in approximately 7% of the population. **Case Report:** On dissection of the axillary region of a 92-year-old female cadaver, an axillary arch muscle was noted on the left side. The axillary arch muscle arose from the anterior aspect of latissimus dorsi muscle on the left side. This muscle gave rise to a fibrous band that extended proximally to blend into the insertion of the pectoralis major muscle. Structures crossing the axilla were covered by the slip of axillary arch muscle as it traversed the area. **Discussion:** Knowledge of the muscular variations of the axilla is important for the clinician to consider when performing axillary examination or procedures. The arch muscle may induce false-positive findings of enlargement of the lateral or posterior lymph nodes during assessment of the region on magnetic resonance imaging (MRI) or palpation exam. **Conclusion:** Compression of the neurovascular structures by an axillary arch muscle may be considered in cases of thoracic outlet syndrome that may not respond to conventional treatment strategies. (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 profile of 2012 Olympic games taekwondo athletes

Mohsen Kazemi, Merrill Ong, Alexander Pacis, Kathy Tseng, Canadian Memorial Chiropractic College

Introduction: The purpose of this study was to compare characteristics of Olympic medal winners (gold, silver, bronze) who competed in the 2012 London Olympic Games against the characteristics of those who competed but did not earn medals. **Methods:** A statistical analysis was used to compare winners versus non-winners stratified by sex in terms of age and body mass index (BMI) as well as offensive points, kicks per match, punches per match, and penalty points. A descriptive comparison was analyzed between 2000, 2004, 2008, and 2012 Olympic Taekwondo competitions. **Results:** This study as well as the last 3 studies did not find any statistically significant differences between winners and non-winners with regard to average age, weight, height, and BMI. There are, however, some trends that were observed. **Conclusion:** Male winners were slightly younger, taller, with a slightly lower BMI versus non-winners. Female winners were slightly older, taller, with a slightly lower BMI versus non-winners. There was an evident increase in frequency of warnings from 2008 to 2012. The warnings and offensive kicks suggest that athletes used a more aggressive and offensive strategy than the more conservative one seen in 2008. (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.)

Senior student survey baseline analysis

Hari Simran Khalsa, Laura Davis, Life West Chiropractic College

Purpose: The aim of this study was to develop a baseline for comparison when assessing the effectiveness of the goals established for the Philosophy V (CPP 434) class. **Methods:** Data were based on responses to the Student Senior Survey administered to students enrolled in the Philosophy V course. Findings from the data were used to identify areas in which goals were not effectively being met and to make recommendations for changes in the current curriculum that might lead to increased effectiveness of achieving or exceeding course goals. **Results:** Participants anticipate practicing the following 5 most frequently reported chiropractic techniques as licensed chiropractors: Diversified technique (25%), Gonstead technique (14%), Knee Chest Upper Cervical Specific (Knee-Chest) technique (10%), and Drop Table technique (9%). The 5 most frequently reported skills participants wish to develop before graduation are Chiropractic Adjusting Skills (20%), Business and/or Management Skills (14%), (Personal) Communication Skills (13%), and (Self) Confidence (6%). Participants indicating a confidence level below the average survey response also indicated that Confidence was a skill they wish to develop before graduation. **Conclusion:** Revisions should be made to the course curriculum to improve chiropractic adjusting skills, improve business/management skills, improve (personal) communication skills, and increase (self) confidence. (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.)

Selection process and preparation for implementation of an electronic health record system in a complementary and alternative medicine (CAM) university health center

Anupama Kizhakkeveettil, Melissa Kimura, Kevin Rose, Southern California University of Health Sciences

Introduction: The electronic health record (EHR) is a major technologic development for improving healthcare practices. The objective of this paper is to describe the process of selecting and preparing to implement an EHR system in a CAM university health center. **Methods:** A committee was formed to identify the available EHR systems and develop a set of specific criteria to evaluate these programs. The most critical of these criteria was supporting multiple specialties, teaching clinics, and HL-7 compliance allowing communication with other systems. **Results:** Five vendors were invited to demonstrate their programs to clinic faculty and staff. Visual Outcomes from Australia was ultimately chosen based on their prior experience with multispecialty health education institutions and superior customer service. A phased implementation plan was developed and is currently being implemented. **Discussion:** It is expected that the implementation of an EHR system at Southern California University (SCU) will result in improvements in patient care, intern education, staff efficiency, and research studies. **Conclusion:** Selection of EHR systems for use at CAM educational institutions is a complicated process but must be accomplished to meet modern educational and administrative requirements. Future studies will be conducted to evaluate the satisfaction with and efficiency of this 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.)

Omohyoid muscle syndrome in a mixed–martial arts athlete

Alexander Lee, Canadian Memorial Chiropractic College, Alexander Yu, Canadian Memorial Chiropractic College, Shayne Young, Canadian Memorial Chiropractic College, Patrick Battaglia, Logan University, John Ho, Athlete's Care Sports Medicine Centres

Introduction: Omohyoid muscle syndrome is a rare cause of an X-shaped bulging lateral neck mass that occurs upon swallowing. **Methods:** We present a diagnostic case report of a 22-year-old mixed–martial arts athlete who acquired this condition secondary to a sports-related injury. **Results:** To the authors' knowledge, this is the first case to be reported in a sports medicine setting. **Discussion:** The injury mechanism, clinical presentation, and diagnostic imaging are discussed in relation to establishing the diagnosis. **Conclusion:** With the increasing popularity of mixed–martial arts sport, the primary care sports medicine provider should be aware of this entity. (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.)

Calcinosis cutis in the foot of a 26-year-old retired female competitive ice skater: a case report

Katie Malley, Ocala Chiropractic, Matthew Richardson, Palmer College of Chiropractic Florida Campus, Marie Williams, Aventura Hospital and Medical Center, Leila McKenzie, Aventura Hospital and Medical Center

Introduction: Calcinosis cutis refers to the abnormal deposition of insoluble calcium salts into the skin and subcutaneous tissue. It is typically classified into 4 groups: metastatic, dystrophic, iatrogenic, and idiopathic. Dystrophic calcinosis cutis is seen with tissue damage and is associated with normal calcium and phosphate levels. Inflammation is believed to be a factor in this type of calcinosis, but dystrophic calcinosis cutis can also be seen in connective tissue diseases, infection, chronic venous stasis, cutaneous neoplasm, and inherited disorders. **Case Report:** We report a case of dystrophic calcinosis cutis in a retired 26-year-old female figure skater diagnosed through radiography, surgical excision, and histopathologic evaluation. **Discussion:** We propose that the repetitive soft tissue damage associated with skating and the rigid boots required may have caused the dystrophic calcinosis cutis in the foot of this patient. Following surgical excision of the calcinosis cutis mass, the patient reported prompt complete resolution of pain, without recurrence of the mass. **Conclusion:** Further work into the design and fitting of figure skating boots may be needed to decrease injury to the soft tissues in the feet of competitive figure skaters. (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.)

Implementing an OSCE as a non–high-stakes clinical assessment and the relationships between the OSCE Score, GPA, and part IV NBCE scores

Wendy Maneri, Jonathon Egan, Heidi Mendenhall, New York Chiropractic College

Introduction: The Objective Structured Clinical Examination (OSCE) is designed to assess clinical competence. High-stakes, National Board of Chiropractic Examiners (NBCE) Part IV-style OSCE examinations are commonly used in North American chiropractic colleges. One chiropractic college commenced a "non-high" stakes (grade points lost only for nonparticipation) OSCE exam with standardized (rather than percentile-based) scoring, in Part IV format. **Methods:** IRB review determined that this educational research project was exempt based on federal guidelines §46.101(b)(4). Literature regarding academic testing stakes receives a brief narrative review. This report discusses 3 consecutive administrations of this "non-high" stakes OSCE. Descriptive statistics, correlations with grade point average (GPA) and Part IV performance, and Spearman Rank-order correlation coefficients are provided. A prediction rule for Part IV–passage based on these items is explored. **Discussion:** Rank-order performance on the "non-high" stakes OSCE correlated with rank-order performance on Part IV ($p < .001$). Standardized scoring (mean, 500; SD,100) can be used to give students a Part-IV–style OSCE score. **Conclusion:** A non–high-stakes OSCE appeared to offer utility at one North American

chiropractic college. There appear to be some advantages to non–high-stakes OSCE assessment. (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 intra- and interexaminer reliability of leg length analysis procedure in prone position among experienced practitioners

Farshid Marzban, Parker University, Ronald Wells, Parker University, Steven Kleinfield, Parker University, Marty Hall, Parker University, Charlotte Watts, Parker University, Larry Eckhardt, Innate Health, Afsar Sokhansanj, Marzban Family Chiropractic, Harrison Ndetan, Parker University

Objective: The aim of this study was to evaluate the interexaminer and intra-examiner reliability of the Activator-prone leg length analysis (LLA) procedure. **Methods:** Three experienced Activator Doctors of Chiropractic performed LLA 3 different times on 24 chiropractic students (each in the prone position). Leg length inequality (LLI) measurements were reported within 1/4 of an inch and the side of shortness. Kappa statistics and percentage agreement between examiners were used to assess interexaminer and intra-examiner reliabilities. The method of this study was approved by the Chiropractic College IRB committee. **Results:** In segregating between the sides of shortness, there was moderate-top-substantial interexaminer reliability between examiners 2 and 3, which increased from trial 1 to trial 3 ($\kappa = 0.48$–0.80; percentage agreement, 70.8%–91.8%). But this was not consistent when comparing measures from each of these examiners with examiner 1. Also, intra-examiner reliability ranged from fair to substantial, with best being between trial 1 and trial 3 of examiner 2 ($\kappa = 0.61$; percentage agreement, 83.3%). However, in segregating the size of LLI within 1/4 of an inch, the results were generally inconsistent. **Conclusion:** The Activator-prone LLA seem to be more reliable in segregating the side of shortness than the magnitude of LLI when measured within 1/4 of an inch. (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.)

Sonography of occult rib and costal cartilage fractures: a case series

Ross Mattox, Kenneth Reckelhoff, Aaron Welk, Norman Kettner, Logan College of Chiropractic

Introduction: Rib and costal cartilage fractures are common injuries that can be difficult to identify on radiography but readily detected by means of diagnostic ultrasound (US). **Case Reports:** We describe 3 cases of fractures, 2 in ribs and 1 in costal cartilage, interpreted as negative on digital radiography, but positive on US. All fractures were considered isolated as there was no associated injury, such as pneumothorax. Two of the fractures had occurred acutely, and one was delayed in its presentation. Both of the acute cases were followed to complete healing (evidence of osseous union) by US. **Discussion:** Utilization of US in the diagnosis and monitoring of acute rib and costal cartilage fractures arguably prevents unnecessary exposure to ionizing radiation and more expensive advanced imaging studies. It can be utilized in the detection and follow-up of isolated rib fractures. Early recognition of rib injury could avoid potential complications from local manipulative therapy. **Conclusion:** US is a non-ionizing imaging tool and is more sensitive than radiography for diagnosing acute rib and costal cartilage fractures. (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.)

Orofacial myofunctional therapy: a case report

Joy Moeller, Academy of Orofacial Myofunctional Therapy, Charles Blum, Sacro Occipital Technique Organization - USA

Introduction: Orofacial myofunctional therapy (OMT), a neuromuscular reeducation of the oral facial muscles, is a modality that promotes the stability of the stomatognathic system. **Case Report:** The patient was a 48-year-old female referred by her chiropractor for OMT. Patient was born with a restricted lingual frenum, which may have led to her low tongue-rest position and mouth-breathing habit. In a craniofacial evaluation, she exhibited an open-mouth at rest; was clenching and grinding; and had an overbite, chronic sinus infections, vertigo for 8 months, earaches, and intermittent tinnitus. **Treatment/Intervention:** Treatment consisted of jaw stabilization exercises, habit elimination and behavior modification, and repatterning the oral facial muscles and changing their function for optimal rest position, chewing, and swallowing. **Results:** At a 1-week follow-up visit, after treatment for jaw stabilization, the patient reported that her pain was gone. Structural support incorporating chiropractic adjustments, along with eliminating habits and muscle repatterning, led to long-term stability. **Conclusion:** An interdisciplinary team approach for health care is critical for benefit of the patient and treating the cause of temporomandibular joint disorders and obstructive sleep apnea (OSA)-related disorders. (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.)

Integrating functional medicine methodologies in the chiropractic clinical setting to improve outcomes for a patient with diabetes, obesity, high blood pressure, chronic sinusitis, and adult onset asthma: a case study

Henry Mueller, Palmer College of Chiropractic, Laurie Mueller

Objective: The aim of this study was to demonstrate how a long-term traditional chiropractic/medical patient achieved enhanced outcomes for the chronic disease conditions of diabetes, obesity, high blood pressure, chronic sinusitis, and adult-onset asthma

when functional medicine/systems biology protocols were implemented as part of a chiropractic management plan. **Methods:** A retrospective review was performed of a patient case over 15 years with analysis of conditions, responses, laboratory findings, treatment protocols, and outcomes. **Results:** Implementing functional medicine resulted in the following: A1c levels within the "controlled range," removing the need for injected insulin; weight loss; blood pressure within normal limits for the first time in 13 years; resolved adult-onset asthma; and resolved chronic sinusitis. **Discussion:** Case report significance could have been enhanced with further diagnostic objective data for dysbiosis, cardiovascular disease, and inflammation. Follow-up should include measurement of the triglycerides in relationship to the patient's lowered Alc levels/monitoring of DISH. **Conclusion:** Functional medicine may be an effective management model for chronic disease issues that are not being adequately addressed through traditional medical/chiropractic care. Functional medicine is a growing movement that is congruent with the vitalistic health paradigm and has potential to affect the face of clinical chiropractic while enhancing patient 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.)

The chiropractic management of infantile retrocollic cervical dystonia

Linda Mullin, Susan Esposito, John Gould, Life University

Objective: In recent years, there has been increased interest in the use of complementary and alternative therapies in the pediatric population. The purpose of this report is to document the chiropractic management and outcome of an infant with the dystonic posture of spasmodic retrocollis. **Clinical Features:** A 9-week-old male presented to a chiropractic office with spasmodic retrocollis following an unremarkable birth. The exam revealed extreme right rotation of the cervical spine and hyperextension posturing of the torso. Vertebral subluxation was found in the upper cervical spine. **Intervention and Outcome:** The patient received a series of 6 chiropractic adjustments to the upper cervical spine. Resolution of the retrocollic posture was achieved. **Conclusion:** A case report of a 9-week-old male with spasmodic retrocollis was presented. The patient's postural distortions were resolved under chiropractic care for reduction of vertebral subluxation. There is limited research on the chiropractic management of dystonias in the pediatric population, with no current cases or proposed mechanisms for spasmodic retrocollis. This case is an example of positive effects of chiropractic care on an infant with retrocollis. (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.)

Total ankle replacement in a 51-year-old with end-stage osteoarthritis: a case report

Karen Numeroff, Inger Roug, Life University

Objective: The aim of this study was to present a case of total ankle replacement in a patient with end-stage osteoarthritis and to briefly discuss prognosis, possible complications, postoperative restrictions, and demonstrate imaging findings. **Clinical Features:** The patient was a 51-year-old female with chronic left ankle pain following a severe car accident 33 years prior. The patient's daily living activities were severely limited, ambulation was with a cane, and there was considerable pain. **Intervention and Outcome:** The patient underwent total ankle replacement. At 10-week follow-up, the patient had regained significant range of motion, was ambulating well, and was pain free with only mild residual swelling. **Discussion:** End-stage osteoarthritis is debilitating and painful, affecting the patient's daily living activities. Surgical arthrodesis is the common method used to alleviate pain and provide ankle stability. Total ankle replacement has emerged as a viable option with minor postoperative restrictions. **Conclusion:** This case study demonstrates a successful total ankle replacement in a 51-year-old patient with end-stage osteoarthritis. The intent of this article is to provide chiropractors with insight on presentation, prognosis, and management of patients with total ankle replacement. (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.)

Ideal placement of the counterforce brace

Mohsen Radpasand, National University of Health Sciences-Florida, Hamed Radpasand

Objective: The objective was to find the ideal placement of the counterforce brace for use on patients with lateral humeral epicondylitis. **Methods:** Seven healthy participants were enrolled after case review and randomized into 1 of 2 groups (4 in group A and 3 in group B). Group A had placed the hard knob padded Counterforce Brace at the lateral epicondyle area, whereas group B had placed the hard knob padded Counterforce Brace in a customary place, which was one in line with the lateral epicondyle over the proximal one-third of the forearm, approximately on the belly of the muscle. The dominant hand received the randomly selected brace placement, and the nondominant hand received the other brace placement by default. Activities and exercises were performed by participants, with the brace and muscle activities analyzed via surface electromyography (SEMG). Study protocol and all the forms were approved by the college Institutional Review Board committee. **Results:** It was more advantageous to place the hard knob padded Counterforce Brace at the lateral epicondyle area than in a the customary place. **Conclusion:** This study suggests beneficial effect of this placement; however, there is a need for a research with a greater sample size. (This is

an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)

Frozen shoulder, its pathogenesis, natural course, and treatment modalities

Dewan Raja, Bahar Sultana, Palmer College of Chiropractic-Florida

Introduction: Frozen shoulder is a common presentation of chronic shoulder pain and disability in the general population and is frequently difficult to manage. A frozen shoulder is a shoulder joint with substantial loss of its range of motion in all directions. Although it is a self-limiting condition, its rather long, restrictive, and painful course forces the affected person to seek medical attention. **Methods:** Most frozen shoulder cases are managed conservatively without surgical intervention. Treatments include nonsteroidal anti-inflammatory drugs, exercises, physiotherapy, and steroid injections. Manipulation under anesthesia and arthroscopy is advocated when conservative treatments fail. **Discussion:** This case of frozen shoulder in a 52-year-old man is presented to illustrate clinical presentation, diagnosis, radiographic assessment, and conservative management. **Conclusion:** The patient regained most of the range of motion in his shoulder, and his pain has subsided significantly with 7 months of conservative treatment. (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.)

Do chiropractors choose certain spinal manipulative therapies depending on various clinical scenarios?

Randell Ricohermoso, Chris LaRocque, Allem Rentulla, Fawad Malik, Matt Ruff, Brian Gleberzon, Canadian Memorial Chiropractic College

Introduction: The purpose of this study was to conduct a survey of Ontario chiropractors in order to ascertain which high-velocity, low-amplitude, spinal manipulative therapy (SMT) they use based on a list of provided clinical conditions of the spine commonly seen in practice. **Methods:** This study consisted of an online survey distributed electronically using Survey Monkey. It consisted of a series of clinical conditions of the spine and a list of the manual procedures taught at the Canadian Memorial Chiropractic College. **Respondents and Results:** Three hundred and sixty-two completed surveys were returned. In general, the most commonly used spinal adjustment for each spinal region was the supine rotatory cervical, the anterior thoracic, the lumbar roll, and the upper (PSIS) sacro-iliac procedure. **Discussion:** Since Diversified technique, the technique system most associated with SMT, does not provide a treatment algorithm to guide a practitioner to preferentially choose one spinal adjustment over another, it may not be surprising that chiropractors rely on relatively few manual procedures to use for manual therapy. **Conclusion:** Respondents to this survey commonly defaulted to a select few spinal manipulations, regardless of the specific spinal condition encountered. (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 video use by students in an x-ray positioning class improve performance? a pilot study and survey of student attitudes

Robert M. Rowell, Kathy Murphy, Linda Carlson, Jody Bell, Palmer College of Chiropractic

Introduction: The goals of this study were to assess whether videos would improve student outcomes and to survey students' attitudes toward videos. **Methods:** We produced videos of the setups for a lumbar x-ray series. Students were given a link to the videos. Descriptive statistics including counts and percentages were produced. Scores on the thoracic and lumbar quiz were compared using Fisher's exact test for students who reported using the videos. **Results:** Surveys were completed by 63 students with 5 reporting watching the videos. There was no significant difference in scores after watching the videos ($p = .967$). Most students (41 [64%]) felt that videos would be somewhat useful, very useful, or extremely useful. The majority of students (50 [78.1%]) agreed or strongly agreed that technology enhances learning. **Discussion:** The majority of students reported that they felt videos would be useful and that they felt that technology enhances their learning; however, only 5 students used our videos. Use of videos did not improve performance. **Conclusion:** There was no significant difference in scores between the unit with no videos and the unit with videos, indicating that use of these videos did not improve the performance of the 5 students who used them. (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.)

Combining chiropractic care with extinguishing of primitive reflexes: a case series of 8 children

Drew Rubin, Samantha Hornick, Eric Landi, Shamya Cooper, Thais Bermudez, Life University

Introduction: The pediatric special needs population is increasing at an alarming rate. More children each year are being diagnosed with disorders ranging from autism, attention deficit hyperactivity disorder, and sensory processing disorder than ever before. The additional step of extinguishing primitive reflexes may be of great benefit to children with neurologic issues and can easily be added to a pediatric chiropractic protocol. **Methods:** Results of 8 children with a variety of neurologic issues were examined in either a University-based chiropractic clinic or a private practitioner's office. The University Institutional Review Board approved this study. **Results:** Positive benefits were seen in this case series of 8 special needs children under the care of 5 different chiropractic providers utilizing chiropractic and primitive reflex work. **Discussion:** The combination of

pediatric chiropractic care and extinguishing primitive reflexes may be of great benefit to the increasing population of children with neurologic issues. (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.)

Applying Lean Six Sigma principles to a chiropractic office: a pilot study

Drew Rubin, Pamela Woodward, Life University

Objective: Lean Six Sigma principles, traditionally applied to business and industry, have a place in a busy chiropractic practice. This pilot study examines how measuring non–value-added time improved 2 major factors: door to table (DTT, or time from patient entry to adjustment) and new patient exam time (NPET, or total time during the new patient process). **Methods:** Stopwatches were used to track the length of time patients spent waiting to be adjusted and also to track individual components of the new patient examination (including wait time between components). Quality improvements based on Lean Six Sigma concepts were implemented. The procedure was repeated 5 weeks later to determine if there was any measurable change. **Results:** At the end of the analysis process, DTT had decreased by 6.68 minutes from an average of 11.91 minutes to 4.47 minutes. Similarly, non–value-added time during new patient exams (NPET) was reduced by 24.86 minutes. **Conclusion:** Lean Six Sigma principles can have significant effects on non–value-added office time and quality improvement. (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.)

Kinetic evaluation of gait in an injured football player before and after chiropractic care

Brent Russell, Ronald Hosek, Kathryn Hoiriis, Ashli Linkhorn, Life University

Introduction: There have been few investigations using gait analysis with chiropractic care. This report describes treatment of an athletic hip injury and initial development of a program using gait analysis as an outcome measure. **Methods:** Questionnaires and an examination were done pre-care. Gait recordings used an instrumented treadmill before and after 4 treatment sessions and at 1-week follow-up. HVLA, drop table, or hand-held instrument adjustments were preformed for the spine, pelvis, and lower extremities; stretching or transverse massage was used with some tight or weak muscles. Gait parameters were analyzed using coefficients of variation and a symmetry index; overall stance forces were analyzed using mean coefficient of variation and mean standard deviation. The university's Institutional Review Board approved the study. **Results:** There were some subjective improvements in questionnaire scores; but baseline gait appeared mostly normal, other than asymmetry of foot rotation, which showed decreases and increases during care and may be compared during future treatment. **Conclusions:** Symptoms related to the athlete's hip injury improved somewhat. However, she had little gait impairment at baseline and showed little change. This study contributes to development of investigation into using gait analysis with chiropractic care. (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.)

Do chiropractic office Web sites convey health-care leadership?

David Schimp, Victor Benavides, Stephen Dyess, Amy Wright, Barry Wiese, Texas Chiropractic College

Introduction: The Institute for Alternative Futures (IAF) assists organizations in discovering trends and provides recommendations for the chiropractic profession. The study evaluates Web sites for evidence of health-care leadership. **Methods:** Clinic faculty collaborated to design a survey that would analyze various aspects of a chiropractic Web site. The survey contained 53 questions. A total of 20 Web sites were reviewed from various cities across the country. **Results:** The categories of general Web site characteristics and advertising and promotion scored favorably. Other categories such as professional image, professional and community leadership, and health-care expertise were not clearly identified. **Discussion:** The IAF has identified recommendations to improve the profession's recognition in the health-care industry Expanding a Web site to include a provider's training, expertise, community and professional involvement, quality measures, transparency, costs and outcomes will help identify the provider as a leader in health care. **Conclusion:** A resource for a chiropractor to utilize in creating a Web site is to follow the recommendations from reputable organizations. Utilization of the IAF or similar organizations will assist the provider to design a Web site that meets today's expectations of the profession and a health-care leader. (This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)

Effectiveness of electroacupuncture on ganglion cysts: a case study

Brian Snyder, Dennis Enix, Logan University

Introduction: A ganglion cyst is most often found on the dorsum of the wrist. Recurrence and reabsorption rates are almost equally as likely with both surgical and conservative treatment. In this study, electroacupuncture was utilized on a large, painful, dorsal wrist ganglion. **Methods:** Diagnostic ultrasound examination of the wrist showed multiloculated hypoechoic signals indicating fluid in an area overlying the scapholunate joint, which is consistent with a ganglion cyst. Electroacupuncture needles were inserted in upper outer quadrants around the cyst with positive and 2 negative poles arranged opposite each other. **Results:** Pain decreased on a visual analog scale (VAS) from 7 to 0,

and wrist extension increased from 20° to 45°. Patient recovery was maintained at a 5-month follow-up. **Discussion:** Ganglion cysts are the most common soft tissue swelling of the hands. Accounting for 50% to 75% of all masses and usually occur in women between 20 and 40 years of age. Electroacupuncture as a treatment for cysts is tested in this study. **Conclusion:** Treatment of a ganglion cyst in the wrist with electroacupuncture showed improvements in range of motion and pain as well as a change in presentation under ultrasound analysis. (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.)

Sexual harassment of female chiropractors by patients in a clinical setting: an exploratory survey

Rachel Statz, Matt Pym, Brian Gleberzon, Canadian Memorial Chiropractic College

Background: The purpose of this study was to survey a group of female chiropractors and inquire as to whether or not they had been sexually harassed by their patients. **Methods:** An online questionnaire was e-mailed via Survey Monkey to 47 female faculty members at the Canadian Memorial Chiropractic College. Respondents were asked if they had been sexual harassed and, if so, the nature of the incident(s), their response to it, how serious they perceived the problem to be, and whether or not they felt prepared to deal with it. **Results:** Forty percent ($n = 19$) of the questionnaires were completed and returned. Eight respondents reported being sexually harassed by a patient, mostly commonly within the first 5 years of practice; it was rarely anticipated. The nature of the harassment varied, and respondents often ignored the incident. Most respondents perceive this to be a serious problem. **Discussion:** Although this is the first survey of its kind, this is a significant problem facing other health-care professionals. **Conclusion:** Among this group of respondents, sexual harassment by patients was a common occurrence. More training, during either a student's chiropractic education or offered as a continuing education program, may be 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.)

Demographic and outcomes retrospective analysis at a university chiropractic clinic

Gerald Stevens, Michael Campeanu, Andrew Sorrento, Jiwoon Ryu, New York Chiropractic College

Objectives: Identify the university patient population demographic characteristics, determine the types of primary and secondary conditions that report to the university chiropractic clinic, and then assess patient outcomes and determine if chiropractic was beneficial in this population. **Methods:** A retrospective study on the State University at Buffalo, The State University of New York, chiropractic files from 2008 to 2009 was performed. The source of demographic information was acquired from existing clinic intake forms. **Results:** Most university student chiropractic patients were 21 to 30 years of age and single, with an almost equal distribution of men to women, with women being slightly greater; most chief complaints were in the lumbar region and/or chronic in nature, mild in severity, and self-referred. There was an excellent overall visual analog scales (VAS) compliance. VAS outcome assessment revealed a 76% overall improvement in cervical region complaints and 70% overall improvement in lumbar region complaints. **Conclusion:** These findings suggest that the university student population show improvements in symptoms following chiropractic care, and incorporating chiropractic care into university campus health centers may be beneficial to 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.)

Demonstrating the use of PaJMA in chiropractic care to improve patient safety and enhance communication

Saira Aaima Sukhera, University of Ontario Institute of Technology, Jennifer Percival, University of Ontario Institute of Technology, Silvano Mior, Canadian Memorial Chiropractic College, Susan Rutherford, Canadian Memorial Chiropractic College

Introduction: Process modeling is an effective tool to manage change within an organization. Patient journey modeling (PaJMA) provides a patient-centric approach to model the change in a health-related setting. This study focuses on the patient journey and the use of PaJMA to improve patient outcomes and increase communication between stakeholders. This paper presents an information flow representation of process modeling to depict the processes related to the patient journey at a North American chiropractic college during the adoption of a new health-information management system. **Method:** Using PaJMA, we outlined the patient's journey with specific metrics accounting for roles involved, information creation/updated, technology used, protocols/guidelines followed, patient needs, and duration of time. **Results:** The assessment of the current state of the system and its related processes are used to identify bottlenecks, constraints, and opportunities for improvement. **Conclusion:** PaJMA as a method to provide a depiction of health-related processes proves to be an invaluable tool, contributing to effective change management and improving overall patient safety while enhancing communication. (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.)

Standing posture and upper cervical misalignment: a practice-based retrospective review of 300 cases

Michael Thomas, Thomas Chiropractic, Russell Friedman, AlternaHealth Solutions, Robert Rectenwald, Life University, Vanessa Thompson, Georgia Tech Research Institute

Introduction: This study is designed to compare the measurable postural and structural relationships before and after upper cervical adjustments. Few studies related to these relationships have been reported in the literature. Grostic and Gregory defined an orthogonal approach to cervical analysis. Gregory and Seeman developed a device to measure standing postural misalignment. **Methods:** This retrospective study had institutional review board (IRB) approval and is based on data collected from randomly selected files in a private chiropractic practice utilizing Quantum Spinal Mechanics (QSM3) adjusting technique. Structural assessment included radiographic analysis of the cervical spine and standing postural analysis utilizing a modified Anatometer. **Results:** Factors from these procedures yielded a collection of 63 discrete data points. There was a statistically significant improvement of alignment from pre- to posttreatment for each of the measurement variables at the $p < .05$ level. Therefore, on average, the treatment resulted in improved alignment for the patients in this study. **Conclusion:** This study serves as a pilot, with the intent to develop an initial database of measured pre- and posttreatment variables with an analysis to determine if alignment improves after upper cervical chiropractic treatment using the QSM3 protocol. The data appear to support this finding. (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 student perceptions following 2 different formats for neuromusculoskeletal (NMS) skills assessment

Michael Tunning, Michael VanNatta, Robert Rowell, Thomas Brozovich, Palmer College of Chiropractic

Introduction: Student assessment format should be driven by its purpose. We saw the need to change the format of the skills assessment examination. The original exam was a face-to-face oral examination. The new format was an anonymous student performance observation (ASPO) in which the instructor observes the student from behind a "one-way" glass mirror. The goal was to make the exam more fair, a better preparation for future exams, a better simulation of private practice, and a more true test of knowledge. We surveyed the students' attitudes and opinions about the new method. **Methods:** Students were first tested with the face-to-face format and later with the ASPO format. Students completed an 8-question survey following the ASPO exam. **Results:** One hundred five students took the exam and completed the survey. Students preferred the anonymous testing format, reporting that it was more fair, a better simulation of actual clinical practice, and a more effective way to prepare for future exams. They were evenly split as to which exam they felt required more preparation time. Age, sex, and grade point average (GPA) were not correlated with which test format students preferred. **Conclusion:** Students preferred an ASPO testing method. (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.)

Enhancing learning for students with the addition of podcasts

Michael VanNatta, Thomas Brozovich, Michael Tunning, Palmer College of Chiropractic

Introduction: Students today are more technologically astute than ever before. With students commonly involved in digital media, the authors identified a method of enhancing student learning through the use of podcasting. **Discussion:** A group of neuromusculoskeletal (NMS) instructors collaborated on finding a way to use technology to increase contact with students and enhance learning. A series of podcasts were created, with the weekly learning objectives used as a guide for the weekly topics. Each podcast lasted 15 to 20 minutes and provided an overview of the main talking points during the weekly lectures. Previous studies in other allied health fields show a positive response from students using podcasts as a means of study. **Conclusion:** Podcasts were developed by NMS instructors to supplement classroom lecture. More research is needed in the use of podcasts and technology in the classroom. (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.)

Putting research into practice: a comprehensive 12-week exercise protocol for fibromyalgia

Jamil Vohra, Joseph Urrea, Robert Burdsall, Dimitri Dimitropoulos, Michael Ramcharan, Texas Chiropractic College

Introduction: Fibromyalgia is a chronic condition that most often affects young to middle-aged women. According to the American College of Rheumatology, it is diagnosed by the presence of widespread musculoskeletal pain for at least 3 months and excessive tenderness in at least 11 out of 18 defined tender points. Currently there are no definitive diagnostic laboratory tests or imaging for fibromyalgia. Its cause is still unknown. The purpose of this appraisal was to evaluate the effectiveness of aerobic training-based exercise programs compared with other types of physical activity on the symptomatology of fibromyalgia. **Methods:** Searches on PubMed/MEDLINE databases using key words "pool exercise," "fibromyalgia," "aerobic fitness," and "home-based exercise" were performed to identify articles comparing different exercise regimens. **Results and Conclusion:** A treatment protocol was developed based on the articles identified. (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 of Rocktape on women's depth jump performance

John Ward, Joseph Urrea, Jamil Vohra, William Amonette, Jesse Coats, Texas College of Chiropractic

Purpose: The purpose of this study was to investigate the biomechanical impact that taping the hips bilaterally in external rotation with Rocktape had on the depth jump performance of college-aged women. **Methods:** Twenty-four healthy women completed 3 baseline depth jumps at 30 cm and 45 cm. Jump kinematic data were recorded using a Vicon motion analysis system (Company name, City, State). Following this activity, participants were randomized to 1 of 2 interventions: (1) Intervention, which had their thighs bilaterally taped in external rotation with Rocktape, or (2) Control, which used no tape. Taping the thighs into external rotation was performed in an attempt to prevent valgus knee stress and internal rotation of the hip upon landing. All participants then underwent similar postintervention depth jump kinematic measurements. Within-groups kinematic data were analyzed with a paired sample *t* test. This study was Institutional Review Board (IRB) approved. **Results:** No statistically significant difference was evident for mean vertical ASIS height during the propulsion phase of the depth jump or the distance between the tibial tuberosities at the depth jump base of participants in either group. **Conclusion:** Preliminarily, this research suggests that taping the hips in external rotation with Rocktape has minimal effect on depth jump performance of women. (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 impact of the Laser Gym device on limits of stability, functional mobility, standing balance, and gait of older women

John Ward, Kimary Farrar, Amir Pourmoghaddam, Stefan Kreuzer, Texas College of Chiropractic

Background: The Laser Gym device is designed to have participants engage in hip-related exercises to improve strength and balance. **Purpose:** This study was designed to determine the effect of training with the Laser Gym device on limits of stability, functional mobility, standing balance, and gait of older women. **Methods:** Fifty healthy women over the age of 60 engaged in a baseline Functional Reach Test (FRT), Timed Up and Go (TUG) test, measurement of single and double leg standing balance, and a 90-second walking kinematic analysis. Following this activity, participants were divided into the 2 following groups: (1) Laser Gym training group for 3 weeks with nine 15-minute total training sessions, or (2) no training group. All participants then underwent similar postintervention measurements. Within-group data were analyzed with a paired sample *t* test. This study was Institutional Review Board (IRB) approved. **Results:** After using the Laser Gym device for 3 weeks, participants were able to reach 1.5 inches farther during the FRT than they could at baseline, but other analyzed attributes were unaffected. **Conclusion:** Preliminarily, this research suggests the action of the pelvic/core exercises performed using the Laser Gym device may marginally improve limits of stability of older women. (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.)

Ultrasound imaging of full-thickness rotator cuff tears: a report of 2 cases

Aaron Welk, Norman Kettner, Logan College of Chiropractic

Introduction: High resolution diagnostic ultrasound (US) has increasingly been incorporated into the imaging armamentarium for evaluation of suspected rotator cuff tears. Tendon location, size, and thickness of the tear are displayed with high sensitivity and specificity. In addition to rotator cuff arthropathy, associated findings such as bursitis, fatty atrophy of muscle, and osteoarthritis are readily detected. **Methods:** Two patients with shoulder pain were referred for US evaluation. **Results:** Both patients were found to have full thickness tears of the rotator cuff, one acute and one chronic. The classic US imaging features of full-thickness rotator cuff tears are discussed. **Discussion:** Rotator cuff tears are a common injury. US is a useful modality for evaluation of the rotator cuff. Imaging features of rotator cuff tears can be used to determine clinical management, including conservative and operative interventions. **Conclusion:** Two cases of full-thickness rotator cuff tears diagnosed by US were presented, one acute and one chronic. US is a useful modality to examine the rotator cuff. Interval imaging may be used to determine treatment response and appropriate 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.)

Chiropractic students' attitudes toward research

Adrian Wenban, Daniel Ranz, Pablo Pérez de la Ossa, Barcelona College of Chiropractic

Introduction: The aim of this study was to survey chiropractic students regarding their attitudes toward chiropractic research. **Methods:** A questionnaire, designed on the basis of previous surveys used for a similar purpose, was constructed, pilot tested, and modified. The resulting 31-item paper-based questionnaire was administered to all current students. Data were introduced in an electronic spreadsheet and processed with an R-language program. **Results:** Eighty-three completed questionnaires (72.80% of college student population) were collected. Seventy-nine students (95%) agreed or strongly agreed that scientific research is necessary in the chiropractic profession. Year-4 students are more confident in their ability and skills to conduct quality research than year-1 students ($p < .02$) and that students' intention to

participate in research is independent of their current year in the program of study ($p = .9$). **Discussion:** This study, because it is a cross-sectional survey, should be followed by prospective studies that monitor students' attitudes as they progress through the program of study. **Conclusion:** This cohort of students has a strong appreciation of the importance of research. Students in the latter years expressed a stronger belief in their ability to carry out quality 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.)

Depressed mood in an elderly patient with chronic low back pain: a prospective case study

Adrian Wenban, Barcelona College of Chiropractic, Michelle Nielsen, Private Practice

Introduction: The aim of this prospective case report is to describe the care of an elderly patient, who presented with depressive symptoms and chronic low back pain, undergoing a course of chiropractic care. **Methods:** A 68-year-old woman presented with chronic low back pain and depression. Part of the examination at baseline, 6 and 12 weeks included administration of 2 self-reported questionnaires (Short Form 8 questionnaire and Beck Depression Inventory II) and 2two scales (Pain Visual Analogue Scale and the Global Well Being Scale). **Results:** The patient was found to have functional spinal problems and a program of care was initiated. From baseline to 12 weeks, the following results were documented: the patient's depression score went from 33 to 17; Mean Physical Composite Score went from 22.3 to 32.5; Mean Mental Composite Score went from 28.2 to 42.3; and Pain Visual Analog Scales (VAS) score went from 7 to 4. **Discussion:** Clinical trials of interventions delivered by chiropractors for patients with depression-related chronic musculoskeletal disorders seems warranted. **Conclusion:** This prospective case report describes the care of an elderly patient who presented with depression and chronic low back pain, both of which improved while the patient received chiropractic care. (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.)

Examiner reliability in analysis of orthogonal radiographs—phase 2

H. Charles Woodfield III, Upper Cervical Research Foundation, B. Burt Gerstman, San Jose State University, John Hart, Sherman College of Chiropractic

Introduction: Before–after intervention orthogonal radiographic analysis procedures used by the National Upper Cervical Chiropractic Association (NUCCA) and others lack evidence of suitable interexaminer reliability. Significant reliability must be demonstrated to justify risk in patient exposure obtaining after-adjustment films. Achieving a 90% examiner agreement in side of Atlas laterality and rotation, with an intraclass correlation (ICC) of 0.9 is this phase 2 study goal. **Methods:** A 3-phase study design reduces inherent variability in procedural analysis, intending to end investigation early for conservation of research resources. Phase 1 trains examiners for fine tuning reliability in orthogonal radiographic analysis, while conducting trial runs, troubleshooting study procedure. Phase 2 collects data from examiners while maintaining data integrity using a data manager. **Results:** Percentage agreement for side of Atlas laterality is 98%, 76% for rotation. ICC for laterality is 0.606 (95% CI, 0.465, 0.717), for rotation 0.716 (95% CI, 0.599, 0.802). **Conclusion:** ICCs represent substantial but imperfect agreement between examiners, not achieving study goal. Phase 3 analysis of predetermined significant sample size of before-adjustment radiographs continues. (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 variability of the FootMaxx system in the assessment of gait parameters

Shar Wynd, Shea Stark, Tecla Fuller, Jairo Rojas, Texas Chiropractic College

Background: Dynamic orthotic systems such as FootMaxx have been used by health-care practitioners to determine patient eligibility for orthotic treatments. These systems are inexpensive and may be useful in providing valuable information to clinicians about therapeutic outcomes. However, to date, the variability of such a system has not yet been examined. **Methods:** A total of 12 subjects were recruited. Their age, height, and weight were determined. Subjects were scanned using the FootMaxx system a total of 3 times per session. One scan was a composite scan of 3 consecutive steps for the right and left legs. Subjects were scanned in the morning and in the afternoon. **Results:** Overall, there were no significant differences between heel strike, mid-stance, or toe-off duration within subjects when their morning scans were compared with their evening scans; however, between individual subjects, there was variability as indicated by the noted significant differences of individual heel strike, mid-stance, and toe-off duration. Subjects demonstrated minimal changes (less than 1%) in their gait parameters between the morning and afternoon sessions. **Conclusion:** The Footmaxx system appears to provide reasonably consistent data and may represent a convenient clinical tool for quantitatively assessing treatment 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 diagnosis of posttraumatic myositis ossificans using ultrasonography and radiography

Alicia Yochum, Martha Kaeser, Kenneth Reckelhoff, Norman Kettner, Logan University

Introduction: The aim of this study was to describe a patient with posttraumatic myositis ossificans (PTMO)

of the anterior thigh following blunt trauma. The incidence, clinical presentation, management, and imaging findings are discussed. **Case Report:** A 17-year-old man presented to our clinic with a chief complaint of left knee pain and reduced range of motion after impacting his left anterior thigh while hurdling 6 weeks earlier. At that time, he presented to the emergency department where radiography of the left knee was negative, and he was diagnosed with a muscle sprain. Radiography and ultrasonography of the left knee in our radiology department revealed ossification consistent with PTMO within his vastus intermedius. **Results:** The patient underwent a course of conservative care. **Discussion:** Over 90% of sports-related injuries are diagnosed as muscle strains or contusions with PTMO forming in approximately 9%–20%. Pathologic features can be divided into 3 categories: pseudo-sarcoma, differentiation, and maturation. Accurate diagnosis is important and can be obtained utilizing radiography and ultrasonography. **Conclusion:** Ultrasonography has the capability to detect early phases of PTMO approximately 2 weeks prior to radiographic evidence and to monitor progression throughout its course. (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.)

Research mentoring: suggestions and encouragement from a reflection exercise

Kenneth Young, Murdoch University

Introduction: The path chiropractic must embrace evidence-based practice and integration into mainstream health-care delivery. Chiropractic has fallen short in the realm of research, although the situation is improving. Opportunities for research training and mentorship are increasing. The purpose of this paper is to identify best practice in the supervision of graduate degree (Masters/PhD-level) candidates. **Methods:** Literature review and reflection on current practices. **Results:** Three main categories were identified within the realm of good research mentorship: choose your candidate wisely; be diligent; be nurturing. **Discussion:** Choosing a motivated candidate with research interests coinciding with the expertise of the mentor will create the best chance for a symbiotic relationship and improve chances of the candidate completing the degree. The Moses/Ryan Role Perception Scale may help set explicit ground rules. A hands-on and forthright approach is beneficial. Co-supervision may aid the process. Criticism should be constructive, and flexibility to life changes will enhance the supervisory experience. **Conclusion:** Research mentorship at a high performance level will help chiropractic integrate better into the mainstream health-care delivery process, enhance prospects for research funding, and potentially improve the status of the profession in various other ways. (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.)

Gimme that old time religion: the effect of the religious propensities of chiropractic's early leaders on the development of x-ray imaging within the profession

Kenneth Young, Murdoch University

Introduction: Chiropractors overutilize plain film x-rays. Various reasons have been explored in the literature; however, little consideration has been given to the religious propensities of the most prominent early chiropractors, DD and BJ Palmer, and how they may have influenced the use of this diagnostic modality through the years. **Methods:** Analysis was made of DD and BJ's writings as compared with the writings of modern chiropractic systems that use x-ray for subluxation analysis. **Results:** Religious properties, defined here as metaphysical concepts, claims of supremacy to others that are similar, rules and rituals, sacred artifacts, sacred stories, and special language are found in both the writings of the early leaders of chiropractic and in modern techniques. **Discussion:** DD and BJ's religiosity toward chiropractic has had significant influence on modern practitioners. Contrary to the evidence available in peer-reviewed literature, a segment of the profession believes that x-rays are useful for finding or quantifying minute spinal misalignments, which is also believed to be the visible portion of a disease-causing lesion known as chiropractic subluxation. **Conclusion:** Modern chiropractic technique systems that use x-ray for subluxation analysis demonstrate the same belief-oriented approach as the founders, rather than a scientific, evidence-based approach. (This is an abstract from a conference presentation only and does not represent a full work that has been peer-reviewed and accepted for publication.)

Attachment in chiropractic practice: a pilot study

Mary Young, Adrian Hunnisett, Christina Cunliffe, McTimoney College of Chiropractic

Introduction: The aim of this study was to investigate attachment in the chiropractor-patient relationship and the ways in which it manifests in verbal interaction and to characterize the attachment style. In addition, it investigates whether patient satisfaction, confidence, and disclosure are affected by variations in this interaction. **Methods:** Following ethical approval, a qualitative pilot study was undertaken on chiropractors and their patients. Data were collected on attachment style, disclosure, satisfaction, and confidence, and the chiropractor/patient interaction was analyzed. A novel interaction analysis tool was developed for the study. Appropriate statistical analysis identified correlations in the data. **Results:** This study suggests no correlation between attachment security of chiropractor and patient, but that chiropractor security is correlated with patient avoidance scores ($p = .07$). Also, a patient's avoidance score affects his/her interaction style ($p < .05$) and that a chiropractor's interaction style is a function of his/her own avoidance score rather than

that of the patient ($p < .001$). **Conclusion:** This study contributes the first data on attachment in the chiropractic context. Further research is needed to test the initial findings of the novel interaction tool, which represents the first combination of attachment theory and interaction analysis. (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.)

Conservative care for pediatric acquired torticollis: 2 cases of muscular origin

Morgan Young, Palmer College of Chiropractic West Campus, Jessie Young, Los Gatos Chiropractic and Wellness Center

Introduction: Pediatric acquired torticollis is a common presenting condition that is often benign and idiopathic but can be a sign of serious pathology and requires full investigation. Having ruled out serious disease, often the symptoms are not treated and it is left to run a natural course with improvement over a couple of weeks. This case report details the conservative management of 2 cases of musculoskeletal acquired torticollis in children under 3 years of age. **Methods:** Both patients awoke with painful, stiff, twisted necks the day after play in a bouncy house. They were treated with conservative chiropractic care including light myofascial release, activator instrument adjusting, and home stretching. **Results:** Patients improved in pain and range of motion immediately post treatment and returned to normal ranges within 1 to 2 visits. **Discussion:** These cases illustrate that after proper neurologic and physical exam to rule out serious pathology, chiropractic care can be an appropriate intervention for musculoskeletal acquired torticollis. (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.)