

---

## Poster Presentations

---

### The Practice of Pediatric Chiropractic

**Joel Alcantara**, DC, International Chiropractic Pediatric Association and Private Practice

#### OBJECTIVE

To further characterize the practice of pediatric chiropractic, we undertook this survey study of chiropractic members of the International Chiropractic Pediatric Association (ICPA), the largest freestanding postgraduate training organization in the field of pediatric chiropractic.

#### METHODS

A survey study characterizing the practice of pediatric chiropractic was e-mailed to 1500 chiropractors. Six hundred forty-six chiropractors completed and returned the survey; 98 were duplicates, which brought the total to 548 respondents for a response rate of 71%.

#### RESULTS

Of the respondents, 332 are females and 216 are males. The five most common techniques used in practice were: Diversified, Activator, Thompson, Craniosacral, Gonstead, Sacro-occipital, and Chiropractic Biophysics.

Our responders saw an average of 133 patient visits per week, with 28 visits from those less than 18 years of age. The average cost of an initial visit was \$127 with a follow-up at \$42. The source of practice income was equal from insurance and cash practices, with a large percentage of pediatric visits paid out-of-pocket. The most common types of care were spinal adjustments followed by wellness care, the use of herbs, exercise, and rehabilitation care, and prayer healing. The five most common reasons for pediatric visits were for wellness, ear problems, digestive problems, musculoskeletal, and attention-deficit disorder (ADD)/attention-deficit/hyperactivity disorder (ADHD). Some 55% of the responders were referred by a medical provider, while only 28% received pediatric referrals.

#### CONCLUSION

To the best of our knowledge, this study provides the largest database from which to characterize the practice of pediatric chiropractic in North America. A significant number of visits to a chiropractor are from children, and even if it is inconsistent with medical guidelines, it is consistent (at face value) with wellness and prevention. Further research is needed to fully examine the issues involved.

~

# A Correlation of Static Versus Motion Models An Updated Approach for Instruction

**Karen A. Bobak**, DC, and **Dennis M.J. Homack**, DC, MS, New York Chiropractic College

## INTRODUCTION

Within the profession, there remain several different conceptual perspectives on how to best describe the fundamental dysfunctional findings of spinal vertebral segments and how to define a method of correction. In contrasting some of the most commonly utilized technique systems, it is found that while, at times, there may not be a direct correlation between systems, there is at least an analogous train of thought. The goal in compiling this information was to follow these similar trains of thought and be able to correlate the appropriate adjustive procedures.

## METHODS

From previous works and with the discussions of faculty members whose professional perspectives were reflective of varied approaches, a rudimentary correlation chart was developed. After sufficient consensus was attained on the correlations and how best to illustrate them, a final draft was prepared.

## RESULTS

In reviewing the materials that were previously available, it was thought that the addition of pictorial representations

would improve the usefulness. The result of this endeavor was the development of a functional tool to correlate existing listing systems with appropriate pictorial representations.

## DISCUSSION

It was our desire to disseminate and integrate knowledge of multiple technique systems. The development of this tool was necessitated by the expanding nature of currently accepted knowledge within chiropractic and the need to prepare students to face clinical challenges.

## CONCLUSION

With the development of this tool, we found as many commonalities as differences among the listing systems. These differences, however, do not negate the effectiveness of this tool in education. It remains to be seen whether this chart will have a significant impact on student understanding, as it has yet to be formally evaluated as a teaching instrument. We therefore recommend further study.

# Survey of Open Pod Clinical Teaching in a Multi-Doctor Setting, Modeling Collaborative Practice

**Ronnie J. Boesch**, DC, **Misty Stick-Mueller**, DC, **Anna Livdans-Forret**, DC, **David Hannah**, DC, and **James Countryman**, DC, Palmer College of Chiropractic

## INTRODUCTION

Chiropractic intern clinical training is very complex, given the number of responsibilities for both instructor and intern.

The open-office setting provides interns with the opportunity to see doctors talking to each other about patients, referrals for concurrent care, and referrals for additional imaging. This allows for modeling for interns for interprofession communications.

## METHODS

A survey was performed to gather information on the opinions of interns in an open-office setting at a chiropractic college.

## RESULTS

The results showed that the interns did concur that this style of learning was effective. A total of 48 interns anonymously answered the written survey (29 men, 18 women, and

1 unspecified). Forty-five responders felt the learning environment was as good or better for learning compared with other modules, one felt it was less conducive to learning, and two did not specify.

## DISCUSSION

This was a limited study that needs larger numbers from multiple open- and closed-office teaching clinics. Future research in this area could help colleges' development planning to provide an optimal learning environment.



# A Primary Ambulatory Care Quality Assessment Program Developed for a Chiropractic College Teaching Clinic

**Morris Braum, DC**, Life University

## INTRODUCTION

Quality improvement articles and programs are common in health care but not in the chiropractic literature. This paper describes the development of a program in a chiropractic teaching clinic.

## METHODS

The program divided the clinic system into 10 parameters, subdivided into individual indicators. Two committees of faculty, staff, and administrators were formed to develop and assess the indicators. Specific plans were developed to improve deficient indicators. The Quality Assurance Officer facilitated the committees, improvement activities, and reporting of results to clinic administration.

## RESULTS

In December 2005, the first assessment cycle for all indicators was completed. A weighted composite of all the scores was calculated at 69.1. The values have ranged from 56.4 to 73.5 since that time. Although these values fulfill a useful

function of having a numerical score to track over time, in actuality they represent the ongoing efforts of many individuals in different areas of the clinic system.

## DISCUSSION

In the first year, failure of the indicators was complicated by ineffective data gathering, and improvements resulted in more accurate evaluations and more effective follow-up improvement activities. The program's end-of-year self-assessment resulted in more formal training in quality management concepts for members of the committees. Also, the initial governing body for the program, which was chosen because of its independence from the clinic, was found to be ineffective for the same reason and reassigned to senior clinic administration.

## CONCLUSION

The consistent analysis of numerous interrelated processes and events by the evaluation teams has encouraged system thinking and has been successful in bringing an awareness of the principles of continuous quality improvement to the administration, the faculty, and the staff of the clinic.



## Ethics and Compliance

### A Model for Internal Auditing of Patient Health Records in a Chiropractic College Clinic

**Anthony A. Cacioppo**, DC, MS, **Jeanne E. McWilliams**, DC, MS Ed, **James V. Owens**, DC, and **Troy L. Tatum**, DC, MS, Palmer College of Chiropractic

#### INTRODUCTION

The Office of Inspector General has stated that the process of self-assessments by auditing and monitoring programs and functions are preventative measures to identify small issues before they become compliance issues. In a chiropractic college clinical environment, the monitoring of patient records is very important yet very difficult to maintain consistency when many students pass through the clinical service during a short period of time. The training of new practitioners to comply with the responsibility of ethical and legal requirements is difficult and demands great attention to detail. The purpose of this paper is to share the process of one institution's development of an auditing and self-assessment program.

#### METHODS

The method used was the random selection of a patient record for a detailed review by clinical administrators and faculty clinicians independently prior to a detailed comparison and discussion of each area of the record by the group.

Medicare patient records were selected to represent a defined format of required documentation. A form was utilized to keep the reviewers consistent and on task.

#### DISCUSSION

The review form covered the following areas of the patient record: history, examination, special studies, diagnosis and management plan, daily progress notes, billing, and overall documentation.

#### CONCLUSION

The auditing process revealed that a review of patient records is important and that a training process is necessary to maintain consistency among a large group of clinicians. A faculty training program was implemented, resulting in an affirmation by the faculty clinicians for the need to follow a consistent guideline in reviewing patient records.



## The Association Between Cerebrovascular Accident and Chiropractic Manipulative Therapy

### A Prospective Study

**Michael J. Carucci**, DC, **Luanne Centrella**, DC, and **Ryan Cramer-Forbes**, DC, Private Practice

#### OBJECTIVE

The purpose of this prospective study was to investigate the incidence of cerebrovascular accident caused by cervical manipulation.

#### METHODS

Patients were selected from the University of Bridgeport College of Chiropractic (UBCC) Clinic over a 2-week period. Initial characteristics were recorded and data associated with each cervical manipulation administered to the patient were recorded.

## RESULTS

Forty-one patients were enrolled by UBCC interns over a 2-week period. The average age of patients was 38 years old, with 66% being female and 34% being male. Patients with pain complaints, which included either upper extremity pain and/or neck pain, accounted for 61% of the total pain complaints. Of the 41 patients enrolled, 30 received cervical manipulation, and of those 30, five received some form of vertebrobasilar screening test (ie, Gerorge's test). Seventy percent of those who did not receive cervical manipulation had either low back, midback, upper back, wrist, or forearm pain. There were a total of 76 cervical manipulations performed over the course of this study. The average numbers of manipulations was 2.53 per patient with a mode

of 2 and a maximum of 7 manipulations over the 2-week period. The vast majority of these manipulations were manual in nature. There were no reported adverse effects noted from the cervical manipulations performed during this study.

## CONCLUSION

The current results show the feasibility of implementing this protocol in a chiropractic college's clinical program to record data associated with cervical manipulation. The current sample is too small to give an accurate estimate of risk; therefore, similar studies need to be performed with a larger sample.

# Conventional Microscopy Versus Computer Imagery in the Educational Laboratory

**Christine Cunningham**, MS, MT(ASCP), **Elizabeth D. Larzelere**, BS, and **Ilija Arar**, DC, New York Chiropractic College

## INTRODUCTION

As human tissue pathology slides become increasingly difficult to obtain, other methods of teaching microscopy in the educational laboratory must be investigated. The goal of this project was to adequately present to our students the morphologic changes that occur in the pathogenesis of disease using computer imagery. We also needed to assess how the computer imagery and Web site used compared with standards of traditional microscopy from a student's perspective.

## METHODS

This undertaking involved the creation of a new computer laboratory, consisting of 32 student terminals and a teacher-dedicated computer linked to a projector and screen. Robbins and Cotran's *Pathologic Basis of Disease*, 7th edition, was chosen as the required text for the course. This gave students access to the Robbins Pathology Web site, including complete content of text, Interactive Case Study Companion, and Virtual Microscope.

Implementation of computer-based learning was assessed using a 28-question summative survey that was produced and administered to three successive trimesters of pathology

students ( $n = 193$ ). The computer survey Web site Zoomerang was utilized, in order for students to evaluate using the same educational medium with which they were working. Answers were given on a scale of 1-5 and statistically analyzed using weighted averages.

## RESULTS

Survey data show an overall positive satisfaction of students with computer imagery compared with conventional microscopy. The most favorable aspect to computer imagery was the 24/7 availability (weighted average 4.16). This was closely followed by the clarification offered by computer imagery by accompanying text and captions (weighted average 4.08).

## CONCLUSION

Although pros and cons exist in the comparison of conventional microscopy and computer imagery, existing conditions warrant the investigation into the presentation of educational material in ways other than traditional microscope use. This study demonstrated statistically that students felt overall approval of computer imagery in the educational laboratory.

# A Retrospective Analysis of the Development, Implementation, and Assessment of an Evidence-Based Practice Course for Chiropractors

**Anthony V. D'Antoni**, DC, MS, New York College of Podiatric Medicine and Seton Hall University, and **Genevieve Pinto Zipp**, PT, EdD, Seton Hall University

## INTRODUCTION

Since the early 1990s, evidence-based practice (EBP) has gained momentum as an important clinical decision-making tool. Most health care professions—including the chiropractic profession—have begun to incorporate EBP principles into their existing curricula. While several chiropractic schools have received grant funding to develop EBP curricula, currently no data regarding its effectiveness have been published in peer-reviewed journals. This paper describes the development, implementation, and assessment of a novel EBP continuing education (CE) course for chiropractors.

## METHODS

A literature review was conducted to identify characteristics of evidence-based practices by chiropractors. Results were used to construct a course description and educational objectives that would promote EBP. A course proposal was submitted to the postgraduate department of a North American chiropractic college for review. The course was accepted as a 6-hour CE seminar. In order to assess acquisition of knowledge and skills, course participants were asked to

complete the 10-question *New York Survey on EBP*. In an attempt to assess course effectiveness, mean scores of participants before and after the course were compared using a paired-samples *t* test.

## RESULTS

The mean score of participants on the precourse survey was 6.11 out of 10, and the mean score of participants on the postcourse survey was 8.11 out of 10. The difference in mean scores between the pre- and postcourse surveys was significant ( $p = .003$ , 95% confidence interval [CI] 0.91-3.08).

## CONCLUSION

The positive change in mean scores between the pre- and postcourse surveys offers evidence that participants learned the principles of EBP. Further studies should investigate the validity and reliability of the *New York Survey on EBP* in a larger subject pool.



# Can a Chiropractic College Clinic Effectively Use Current Technology Available for Record Keeping?

**Scott F. Donaldson**, DC, and **Don Lewis**, DC, Life Chiropractic College West

## INTRODUCTION

Two years ago, the idea of using digital records for patient files was introduced to our clinic administration. There is much to consider in attempting such a change in a chiropractic college clinic. The college clinic forms are typically more involved than those of the average office. Whether performed in a typical or college clinic setting, all services must be well documented in the record and for accounting purposes. Additionally, a college clinic must

transfer this information into quantitative and qualitative clinical graduation requirements.

Most of the previously written software does at least a fair job of documentation. Two years ago, none appeared to address the additional needs of the chiropractic college clinic. Although there are advantages to using a digital system, there are also challenges.

## OBJECTIVE

The purpose of this study was to evaluate existing record-keeping software and to determine its usefulness in the chiropractic college clinic setting, either by integrating an existing program or by attempting to create a new product.

## METHODS

We needed to discover or create a product that would meet the unique needs of a chiropractic college clinic. The system should summarize important information, include various levels of security, and be affordable, fast, and easy to learn and customize. Our initial system trial proved unsuccessful

as we encountered challenges involving unfamiliar forms, an unreliable wireless network, operational difficulties with hand-held PDAs, and insufficient security. Clinic administrators worked with EMR4 doctors to create a Web-based SQL server product that met all of the needs of the college clinic.

## CONCLUSION

Although the technology exists, prior to the creation of this system there was not any system that allowed patient records to be kept, while automatically creating accounting and graduation requirement records. This system also allows us to streamline processes, integrate other records (paper or digital), and easily harvest information for research.



# Vibration-Induced Neural Plasticity in a Subject With Dysafferentation Syndrome A Case Study

**Dennis Enix, DC, and Kristan Giggey, DC,** Logan College of Chiropractic

## INTRODUCTION

Neuroplasticity as the functional basis of motor conditioning is central to rehabilitation strategies. Studies involving motor plasticity have shown this training-dependent model to cause cortical reorganization. Peripheral sensory stimulation has been shown to induce long-term plastic changes in the motor cortex.

## OBJECTIVE

The purpose of this study was to evaluate whether the somatosensory afferentation induced by vibration therapy would result in neuroplastic changes in a participant with dysafferentation syndrome of the lower extremity.

## METHOD

This study approved by the Logan College Institutional Review Board included measurements involving proprioception testing of the lower extremity, reaction time, and

movement velocity; sEMG analysis of the gastrocnemius and tibialis anterior muscles; and F-wave and M-wave analysis of the peroneal nerve. The study was conducted in a laboratory at the College Research Division, and the participants were two healthy age-matched consenting females between the ages of 22 and 26, one with no history of lower extremity injuries and one with a history of lower extremity injuries.

## RESULTS

Neuromuscular stimulation increased reaction time by 44%, movement velocity increased by 114%, and proprioceptive error decreased by 75%. F-waves showed an increase of 51%; M-waves increased by 32% with a significant decrease in muscle activation seen on sEMG.

## CONCLUSION

The use of specific vibrational frequencies is an effective means of stimulating the dorsal column tracts and may enhance motor cortical plasticity and excitability.



# Head Repositioning Accuracy in Healthy Subjects Effect of Muscular Fatigue

**Andréanne-Claire Gamache, Isabelle Sideleau, Jean Raymond, DC, MSc(c), and Martin Descarreaux, DC, PhD, Université du Québec à Trois-Rivières**

## BACKGROUND

Recent evidence suggests that joint disorders and fatigue can lead to deficits in proprioception. Muscular fatigue modifies the peripheral proprioceptive system and the central processing of proprioception. During muscle fatigue, nociceptors are activated by metabolic products of muscular contraction. These metabolites have a direct impact on the discharge pattern of muscle spindles and can alter proprioception.

## OBJECTIVE

The purpose of this research was to study the effect of fatigue on cervicocephalic kinesthetic sensibility in healthy subjects and to evaluate the relevance and drawbacks of using such protocol with clinical populations.

## METHODS

Thirteen healthy subjects participated in this study. Subjects reproduced different cervical positions in rotation (15°-30°, left-right). In the learning period preceding each condition, visual feedback was provided using a laser beam. Following these learning trials, subjects performed 10 trials without the laser beam feedback. The whole procedure was

completed in nonfatigue and fatigue conditions (monitored by EMG), and movement parameters were compared between the two conditions.

## RESULTS

The statistical analyses did not yield any significant main effect of fatigue. All movement velocity and acceleration variables were similar in the fatigue and nonfatigue conditions. An Amplitude  $\times$  Fatigue interaction was noted for the deceleration time. The deceleration time was longer for the 30° targets without fatigue, whereas it was similar for the 15° and 30° targets with fatigue.

## DISCUSSION

The results demonstrated no significant effect of fatigue on most of the chosen dependent variables. Our protocol may not have been sufficient to create any significant change in cervical motor control. In fact, the vestibular and visual afferents may have compensated the bias induced by muscular fatigue of the sternocleidomastoideus muscle.

Head repositioning task can probably be studied using known motor control laws and, therefore, it would be interesting to compare chronic neck pain subjects to healthy subjects in a similar task.



## Organizing the Technique Curriculum A Case Report

**Christopher Good, DC, MA(Ed), Matthew Funk, DC, Stephen Perle, DC, MS, Gary Greenstein, DC, and Paul Sherman, DC, University of Bridgeport Chiropractic College**

## INTRODUCTION

Teaching technique is rewarding, but all faculty must know and support the technique curriculum. At the University of Bridgeport Chiropractic College, the technique courses

had changed idiosyncratically over the years with new hires and course lead changes. In conjunction with a curriculum revision, the technique faculty organized themselves, creating both a process and the documents necessary to improve instruction and curriculum integration, and the results of these changes are reported in this paper.



## METHODS

A Technique Subcommittee was formed whose first action was to unify all courses by utilizing a single required text (*Chiropractic Technique* by Peterson and Bergmann). Specific lecture topics and lab skills were identified and were reported on standardized forms. A unique spreadsheet was designed that catalogued this information. Additional discussions took place regarding terminology, in-class adjusting rules and informed consent forms, injury-reporting rules and forms, standardized grading on technique practical exams, and improved continuity and integration of technique course content within the student clinic. Suggestions based on a "Technique To Do List" were forwarded to the administration.

## RESULTS

Eight core topics were identified and given a home. The wish list was acted upon with a number of results, including room remodeling and creating a "technique bundle" to be bought in the bookstore by new students. Contact hours were changed with a focus on increasing course integration

and expanding out-of-class learning opportunities. Agreements were reached on in-class adjusting rules and informed consent forms and injury-reporting rules and forms.

## DISCUSSION

The collaborative process has helped organize and invigorate the technique program. The new documents should enhance future monitoring and revisions. The administrators were receptive and the College was able to show visible results that kept the Technique Subcommittee momentum going and improved student morale.

## CONCLUSION

The technique forms created in this process have helped increased understanding and integration and have created a basis for future quality improvement endeavors. The dialogue that was created between faculty and the administration has improved the academic culture, which has also benefited the program.



# Correlation of GPA and Diagnostic Imaging Scores on the NBCE Exam

**Laura Greene-Orndorff**, RT, DC, and **John Hart**, DC, Sherman College of Straight Chiropractic

## INTRODUCTION

This study sought to determine whether there is a correlation between cumulative grade point average (GPA) and National Board of Chiropractic Examiners (NBCE) scores in diagnostic imaging (DIM).

## METHODS

The GPAs and national board scores were analyzed for 115 students who took parts 2 and 3 in the Spring quarter 2006 at Sherman College. The data were entered into a spreadsheet and analyzed in the Statistical Package for the Social Sciences (SPSS, Version 14.0, Chicago, IL).

## RESULTS

The data were not normally distributed according to the Kolmogorov-Smirnov and Shapiro-Wilk tests ( $p < .05$ ). Therefore nonparametric statistics were used (Wilcoxon for differences and Spearman for correlation). There was a significant correlation ( $r = .628$ ,  $p = .000$ ) between GPA and DIM for all students ( $n = 115$ ). When the group was divided in approximately half (55 having a GPA of 2.8 and below and 60 having a GPA of 2.9 and above), there was a significant increase ( $p = .000$ ) of DIM scores for students in the higher GPA group ( $p = .000$ ). Only one student in the group having a 3.0 GPA and higher ( $n = 52$ ) failed the DIM, whereas no student failed in the group having a GPA of 3.2 and higher ( $n = 34$ ).

## DISCUSSION

The data indicate that as GPA increases, the likelihood that the student will pass DIM on national boards also increases.

and DIM scores in this group of students, with those with higher cumulative GPAs being more likely to pass the DIM section of national boards. All students in this study with a GPA of 3.2 and higher passed the DIM section.

## CONCLUSION

There is a significant correlation between cumulative GPA



# Evidence-Based Practice and Curriculum Development at UBCC

**Gary Greenstein, DC, Matthew Funk, DC, Paul Sherman, DC, Christopher Good, DC, M Ed, and Stephen Perle, DC, MS,** University of Bridgeport College of Chiropractic

## INTRODUCTION

It is the responsibility of the educational institutions to lead a profession. Sackett first brought to the attention of educators the importance in having both research and clinical experience as part of the educational process and the advance of the health care professions. The University of Bridgeport College of Chiropractic (UBCC) is going through major curriculum revision to incorporate evidence-based practice principles to improve the educational process at the College and to benefit patient and overall health care.

## METHODS

For the past several years, curriculum domains and objectives have been written that not only follow the Council for Chiropractic Education (CCE) guidelines but are also tailored toward UBCC faculty wishes and the college's mission statement. Since August 2005, the faculty has been participating in subcommittee meetings. Subcommittees consist of technique, basic science, physical examination, diagnosis, and treatment/management.

## RESULTS

The subcommittees have refined the 1st-year objectives, have conducted seminars on specific topics to the faculty, and have united the faculty to produce a more directed and enthusiastic educational program. An Excel computer program has been developed that identifies all objectives, clarifies what objectives are presently being met, and recognizes competencies that need to be incorporated into the new curriculum.

## DISCUSSION

An integrated studies class will be team taught and will incorporate classes that have been changed from the old program to the new curriculum. It will also identify "needed to know information" and will introduce this information to the 1st-year student by the use of case studies, tutorials, seminars, and computer-aided programs.



# Improvement in the Quality of Life of a Patient With Multiple Neuromusculoskeletal Disorders Undergoing Chiropractic Care

**Joseph V. Haezebrouck**, DC, PT, and **Robert B. Mattson**, BS, Life University College of Chiropractic

## OBJECTIVE

The purpose of this paper is to describe improvements in the quality of life of a patient with multiple knee replacements and chronic neck, low back, and shoulder pain undergoing chiropractic care.

## CLINICAL FEATURES

The patient was a 60-year-old male with chronic neck, low back, knee, and shoulder pain. After multiple knee replacement surgeries, the patient was placed on long-term work disability because of the nature of his work. He seemed to be in a depressive state as a result of dealing with chronic pain and altered lifestyle when first assessed in our chiropractic clinic. The patient noted he was unable to enjoy recreational physical activities because of chronic bodily pain.

## METHODS

Contact-specific, high-velocity, low-force adjustments (ie, Thompson drop table technique) were applied to the areas of vertebral subluxation. The patient was fitted for Foot Levelers orthotics for comfort and biomechanical support of the lower extremity.

## RESULTS

The patient reports great relief from chiropractic adjustments and has a custom-made pair of orthotics for each pair of shoes he owns. These interventions allow the patient to live an active lifestyle and participate in golf, weightlifting, and bicycling pain free. Outcome assessments used to measure progress were the SF-36, Revised Oswestry Disability Index (RODI), Neck Disability Index (NDI), and Quadruple Visual Analogue Scale (QVAS). Marked improvements in these assessments were achieved throughout care. This case may constitute chiropractic care and functional rehabilitation as one way to increase the quality of life of patients with multiple neuromusculoskeletal disorders.

## CONCLUSION

The quality of life of a patient with multiple neuromusculoskeletal disorders and a history of seven total knee replacement surgeries following chiropractic and functional care is presented. Quality of life in this case report was measured by increased physical activity, a marked decrease in the patient's symptoms, a reduction in vertebral subluxations, and the use of disability index forms.



# Determining Spinal Level Using the Inferior Angle of the Scapula as a Reference Landmark Retrospective Analysis of 50 X-Rays

**Michael T. Haneline**, DC, MPH, **Robert Cooperstein**, MA, DC, **Morgan D. Young**, BS, and **Justin Ross**, BS, RN, Palmer College of Chiropractic West

## BACKGROUND

The inferior angle of the scapula (IAS) is said to be at the level of T7, T8, or T9, depending on the source. This discrepancy may result from some authors referring

to the level of the spinous process, while others refer to the vertebral body. Nonetheless, no studies have attempted to determine which vertebral segment truly corresponds to the IAS. Locating the precise spinal level by palpation is important to practitioners who attempt to apply manual therapy to a specific spinal segment.

## OBJECTIVE

The purpose of this study is to determine which spinal segment corresponds to the level of the IAS by means of measurements taken on AP full-spine radiographs taken in an upright neutral posture.

## METHODS

Fifty radiographs were sequentially selected from the x-ray archives of a chiropractic college. Two examiners (chiropractic students who have completed training in x-ray interpretation) analyzed each x-ray independently. Discrepancies were resolved by one or both of the study's licensed chiropractors. Examiners used a straight edge to ascertain which spinal level corresponded with the right and left IASs. For analysis, each spinal level was subdivided into three regions: upper vertebral body, lower vertebral

body, and intersegmental. Ethics review board approval was obtained.

## RESULTS

The mean spinal level corresponding to the left IAS was 9.5 (SD 1.98; range from 5 [lower T7] to 13 [upper T10]), in other words, midway between the T8-9 interspace and the upper T9 body. The mean spinal level corresponding to the right IAS was 10.3 (SD 1.87; range from 5 [lower T7] to 14 [lower T10]), representing the upper T9 body.

## DISCUSSION

There is a considerable amount of variability of where the IASs are positioned, most commonly at the level of the upper body of T9 on the left and the lower body of T9 on the right.



# Survey Evaluation of Clinic Abroad Program Goals and Objectives

**David W. Hannah, DC, Karol A. Donaubaue, DC, and Lori M. Curry-Whitcomb, RN, MS,** Palmer College of Chiropractic

## OBJECTIVE

The purpose of this paper is to evaluate and determine, from an alumni perspective, if the goals and objectives of a Clinic Abroad Program (CAP) at a chiropractic college are met.

## METHODS

A 36-question survey was mailed to 1641 previous CAP participants on trips over a period from October 1997 to October 2004 (14 separate trips). Four hundred thirty-seven people responded (26.63%). The responses were broken down into five main categories according to the goals and objectives of the CAP: 1) provide quality clinical education in unique learning environment; 2) broaden educational experience required in the classroom; 3) increase cultural awareness; 4) further develop humanitarian and service orientation; and 5) promote the chiropractic profession and chiropractic college campuses to the world, student interns, faculty clinicians, and alumni field doctors.

## RESULTS

Data from 437 respondents were compiled and averaged to determine whether the CAP goals and objectives were met on the various trips and to what extent. Results of the survey showed that all of the goals and objectives set by the CAP department were met. The respondents had a preference for promoting chiropractic internationally while at the same time developing cultural awareness. Interestingly, the lowest goal was in developing humanitarian service orientation in their private practices. Additional data pertinent to the development of further international trips were collected in the survey.

## CONCLUSION

Various organizations may use these results to develop their own program, to improve the various aspects of future trip designs (to increase clinical, educational, or cultural experiences), and to expand their humanitarian aspects.



# Abnormal Static Sagittal Cervical Curvatures Following Motor Vehicle Collisions

## A Retrospective Case Control of 41 Subjects Exposed to a Motor Vehicle Collision

**Deed E. Harrison**, DC, Private Practice, **Donald D. Harrison**, PhD, DC, MSE, Université du Québec à Trois Rivières, **Evan Katz**, DC, Private Practice, **Joseph R. Ferrantelli**, DC, Private Practice, **Tadeusz J. Janik**, PhD, CompMath, and **Burt Holland**, PhD, Temple University

### OBJECTIVE

Previous investigations have found a correlation between abnormal curvatures and a variety of cervical pains and disability. However, no study has shown that loss of the cervical curve is a direct result of exposure to motor vehicle collisions (MVC). Our purpose was to investigate the possible alterations in the geometric alignment of the sagittal cervical curve as a result of MVCs and to investigate possible increases in pain and disability.

### METHODS

A retrospective consecutive case series of subjects with both a preinjury lateral cervical x-ray and a postinjury lateral cervical x-ray after exposure to a MVC was studied. Computer analysis of digitized vertebral body corners on lateral cervical radiographs was performed.

Three spine clinic records were reviewed, over a 2- to 3-year period, looking for patients where both an initial lateral cervical x-ray and an examination were performed prior to the patient being exposed to a MVC; afterwards an additional exam and radiographic analysis were required. A total of 41 subjects met the inclusion criteria. Examination records of pain location and intensity on numerical rating scores (NRS) were analyzed. The lateral cervical radiographs were digitized and modeled with a piece of a circle. Radiographic

variables included total curve (Cobb C1-C7, Cobb C2-C7, ARA C2-C7), segmental curvature, horizontal translation of C2 relative to C7, segmental translations (retrolisthesis and anterolisthesis), and circular radii.

### RESULTS

There were 15 males and 26 females with an age range of 8 to 65 years. The majority of subjects were drivers (24) involved in rear-end impacts (27). The preinjury NRS was 2.6, while the postinjury was 5.0 ( $p < .001$ ). An altered cervical curvature was identified following exposure to MVC, characterized by an increase in radius of curvature and a  $10^\circ$  reduction from C2 to C7 ( $p < .001$ ). The midcervical spine (C3-C5) showed the greatest curve reduction. Several subjects developed segmental translations that approached the instability value.

### CONCLUSION

Abnormalities of the cervical lordosis occur from exposure to motor vehicle collisions. The average loss of curvature was  $10^\circ$  from C2 to C7, with straightening of the midcervical segments, and segmental translations often occurred. Snap-through type or dynamic buckling during the MVC may be an explanation for our findings.



## Structure Does Not Necessarily Dictate Function

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

### INTRODUCTION

There seems to be a notion in certain chiropractic circles

that all structural problems of the spine (SPOTS) have an automatic adverse effect on a person's health. The literature was reviewed to determine the validity of this notion.

## METHODS

A literature search was performed on common SPOTS conditions typically seen by the chiropractor (eg, nonsevere scoliosis, Cobb's angle of 20° or less) to determine if SPOTS always causes health problems (ie, symptoms and/or neurological dysfunction).

## RESULTS

Patients often experience good health in spite of having spinal osteoarthritis, degeneration, disc problems, misalignment, and scoliosis. As one author has stated, "the presence of an imaging study abnormality does not automatically imply causality."

## DISCUSSION

The notion that all patients with SPOTS have or will have health problems is flawed because: 1) the literature does not

support such a notion, 2) the body can adapt to such structural faults, and 3) intervening in a condition that may not require intervention is to risk the occurrence of iatrogenesis. If by *function* we are referring to symptoms and/or nerve dysfunction, then it seems the axiom *structure dictates function* does not apply to all cases. For the chiropractors focusing on symptoms or nerve dysfunction, it is not a foregone conclusion that SPOTS is related to these functional health outcomes in a given patient.

## CONCLUSION

A patient with SPOTS may not necessarily be suffering ill effects from the SPOTS. This means that structure does not necessarily dictate function. Reliable and valid methods are needed to determine which patients with SPOTS are being adversely affected by their SPOTS, and which ones are not.



# Thermal Patterns and Health Perception

**John Hart**, DC, and **W.R. Boone**, PhD, DC, Sherman College of Straight Chiropractic

## INTRODUCTION

Thermal pattern analysis is a method that purportedly assesses autonomic health. This study sought to determine whether there is an association between persistent thermal patterns and decreased health perception.

## METHODS

The study was approved by the Sherman College IRB. Fifty-eight chiropractic students received two paraspinal thermal scans, 10 minutes apart, followed by completion of the SF-12 health survey. The scans were imported into a thermal pattern calculator (TPC), which yielded a percent similarity for the left and right paraspinal readings (left and right channels). The data were analyzed by arranging the TPC percents in a list from highest to lowest, along with corresponding SF-12 scores. The SF-12 scores corresponding to the highest TPC percents were compared to SF-12 scores corresponding to the lowest TPC percents for calculation of effect size (ES), starting with SF-12 scores corresponding to the 20 highest TPC percents compared to SF-12 scores corresponding to the 20 lowest TPC percents, then 25, and so on.

## RESULTS

Incremental analyses showed a significant correlation of ES scores between TPC percents and SF-12 scores in the following: 1) left-channel TPC percents and mental composite scores ( $r = 0.943$ ,  $p = .000$ ) and 2) right-channel TPC percents and the physical ( $r = 0.767$ ,  $p = .005$ ) and mental ( $r = 0.936$ ,  $p = .000$ ) composite scores.

## DISCUSSION

As the difference between high and low TPC percents increased, differences between corresponding SF-12 scores also increased and vice versa as evidenced by the significant correlation ES scores.

## CONCLUSION

In this population, persistent thermal patterns were associated with low health perception and vice versa.



# Effects of the Sacro-occipital Technique on the Quality of Life in a Lung Cancer Patient Undergoing Chemotherapy and Radiation Treatment

**Marilyn Holbeck, DC, Alison Tomson, MS, Charles L. Blum, DC, and Robert Monk, DC, Sacro Occipital Technique Organization-USA**

## INTRODUCTION

Gastrointestinal (GI) secondary effects from chemotherapy are a common occurrence for patients receiving oncological care. This study notes clinical improvements in GI disturbances secondary to chemotherapy and radiation treatment through the application of the sacro-occipital technique (SOT), incorporating novel chiropractic diagnostic, analysis, and treatment methods.

## CASE REPORT

The patient was a 57-year-old female patient, diagnosed January 2004 with lung cancer, had tumor removal February 2004, began chemotherapy following surgery, and began radiation therapy July 2004. Her GI disturbances started February 2004 and her oncologist had prepared her for that likelihood. The patient was a chiropractic patient since 2000, treated for recurrent low back pain and never reported any GI disturbances prior to February 2004.

## TREATMENT INTERVENTION

Chiropractic care focused to the thoracic vertebrae, guided by reflexes relating to GI viscerosomatic innervations. The manipulative procedures were preceded by occipital fiber reflex techniques and were followed by reflex somatovisceral contacts related to the stomach, lungs, and diaphragm. The nutritional supplements utilized were eicosapentaenoic acid, pepsin, pancreatic enzymes, bile, and liver concentrates.

## RESULTS

The patient noted that with the SOT chiropractic care her digestive disturbances were significantly lessened and occasionally completely alleviated while concurrently receiving chemotherapy and radiation therapy.

## DISCUSSION

SOT incorporates analysis and treatment of viscerosomatic and somatovisceral reflexes and referred pain patterns called chiropractic manipulative reflex technique (CMRT). In this case, CMRT was administered to a patient during treatment for lung cancer to help alleviate GI side effects secondary to chemotherapy and radiation therapy. CMRT can be used to help treat visceral mimicry syndromes or dysafferentation at the spinal joint complex, associated with vertebral visceral syndromes.

## CONCLUSION

SOT and CMRT along with nutritional supplementation might offer relief for patients who experience adverse digestive side effects during cancer treatment. The gentle low-force nature of this care warrants greater research because of the low risk and potential benefits.

~

# Effectiveness of Custom Orthotics at Reducing Injuries in a College Football Team

**Brian Jensen**, DC, Foot Levelers Inc., **William Austin**, DC, Foot Levelers Inc., **J. Nathan Wilder**, MS, ATC, Waynesburg College, **Brent A. Ungar**, DC, Private Practice, **John Zhang**, MD, PhD, Logan College of Chiropractic, **Dennis L. Nosco**, PhD, Nosco Consulting, and **Mark Mandell**, DC, MBA, Foot Levelers Inc

## INTRODUCTION

A study was conducted looking at the effect of custom-made orthotics on the injury rate for a college football team using the previous year's injury rate as the control. Secondary indicators such as satisfaction with orthotics and injury self-reports for this and previous seasons were also measured.

## METHODS

Inclusion criteria were: 1) a football player active on the team at the time of the start of the study, and 2) a signed informed consent document. Exclusion criteria included failing to complete the season on the football team and/or failing to wear the orthotics for at least 2 weeks. Study participants filled out a prestudy questionnaire. Their feet were then scanned by a local chiropractor using the Associate scanner and the scans were used to fit the players with Ultra Tough and Extreme XT custom-made orthotics from Foot Levelers Inc., the sponsor of this study. Data from the college injury database were gathered for the 2004 and 2005 seasons and data related to injuries of the lower body-half were extracted. The data were coded and analyzed by a third-party consultant. Statistical programs used included Microsoft Excel version 11.0 and SPSS, version 10.0.

## RESULTS

Lower body-half injuries decreased from 148 in 2004 to 126 in 2005. Significant percentage drops (method of multiple proportions) were seen in knee injuries (29 to 20) and in lumbar spine injuries (14 to 7). Small drops in 2005 injuries from 2004 were seen in foot, ankle, lower leg, toes, and patella injuries and small increases in 2005 were seen in hip and thigh injuries. All player groups except wide receivers reported above a neutral satisfaction level with their orthotics, although standard deviations and ranges were large for most groups.

## CONCLUSION

Custom-made, flexible orthotics appear to have a positive effect on the lower body-half injury profile of college football players. Future studies are needed to elucidate the nature and absolute magnitude of the positive effect on injury rate and to determine which player positions and which individual players will benefit most from the use of these orthotics.



# Student Patient Education Awareness and Knowledge (S.P.E.A.K) A Clinic Marketing Program That Augments a Chiropractic Student's Educational Process and Impacts the Chiropractic Profession

**Julie Johnson**, DC, Palmer College of Chiropractic

## INTRODUCTION

S.P.E.A.K. is the acronym for a clinic marketing program

at a chiropractic institution called Student Patient Education Awareness and Knowledge. S.P.E.A.K. is designed to address three distinct areas: student education, community education, and new patient recruitment. S.P.E.A.K. offers profession-



alism training and ethical behavioral guidance, in addition to general training in the use of spinal screening materials that will translate into practical use once in clinical practice.

## METHODS

The first S.P.E.A.K. training program was launched in January of 2006. At the end of the program, all students who successfully complete the program become known as S.P.E.A.K. Specialists. The training program is facilitated by the Clinic Marketing Faculty.

## RESULTS

A total number of 205 students enrolled in the S.P.E.A.K. Program before the implementation of the training program. To date, 61 students have completed the training program and received specific status as "S.P.E.A.K. Specialists."

## DISCUSSION

This program has been a new venture with consideration to addressing the need of the chiropractic student to have supervised access to members of the community for communication and new patient recruitment purposes. To the author's knowledge, this is a unique program to this particular chiropractic institution and should be considered for review and implementation by other institutions. Allocation of resources into this program not only benefits the students on an immediate basis, but affects the profession overall. The more training they possess, the greater opportunity they will have to raise the consciousness level about chiropractic as a whole within the general public.

## CONCLUSION

Strategic implementation of a program such as S.P.E.A.K. is relevant to any chiropractic institution. Teaching students to be professionals establishes a profession.



# Beyond Compliance Chiropractic, Wellness, and the Council on Chiropractic Education

**Lisa Zaynab Killinger, DC**, Palmer College of Chiropractic

## BACKGROUND AND PURPOSE

In February 2007, chiropractic education will formally include the new Council on Chiropractic Education wellness competencies (CCEWC). The competencies propose that the chiropractic clinical encounter include: assessment of disease risk, prevention and health promotion recommendations, and patient care. This article describes programmatic changes moving one college beyond compliance with the CCEWC, toward a positive focus on wellness as a core value of chiropractic education.

## METHODS

This project builds from the results of a 2004 and 2005 assessment of faculty on wellness, health promotion, and prevention. The project leader incorporated faculty input on the topics most important and practical to implement into the chiropractic educational and clinical settings. Using this descriptive data, the CCEWC, the *Healthy People 2010* document, and the *Clinician's Guide to Clinical Preventive Services*, a team of faculty developed action plans for an

institutional shift toward a wellness focus and action steps to achieve that goal. Two faculty in-services were conducted on "Wellness, the CCE, and *Healthy People 2010*."

## RESULTS

The program, currently being implemented includes these action steps: 1) background educational development of stakeholders, 2) development of community-based and national wellness resource lists, and 3) use of these resources in patient, student, and faculty education. The five focus areas identified by faculty were: physical activity, tobacco-use cessation, nutrition, overweight/obesity, and injury prevention. A list of chiro-friendly resource organizations has been developed. Details of these action items and resources are summarized in this presentation.

## DISCUSSION

The CCEWC may lead the chiropractic profession beyond

mere compliance toward a leadership role in health promotion and prevention. In sharing the strategies for implementing the CCEWC, our institutions and ultimately our

patients stand to benefit greatly from the emerging focus on health and wellness in chiropractic education.



## Communicating Chiropractic to Special Populations Using Student Projects for Pediatric Patient Education

**Brigette Langston Kinard, DC**, Life University

### INTRODUCTION

The use of complementary and alternative medicine therapies has been increasing considerably in the pediatric population. Therefore, it is important that chiropractors and students learn to interact with this special population. A self-directed participatory teaching method was employed that targeted the pediatric population and was instituted into a chiropractic curriculum. The purpose of this study was to determine whether the self-directed participatory teaching method helped increase student confidence levels when educating the pediatric patient about their spine and nervous system.

### METHODS

A four-question presurvey was given to 22 senior-level chiropractic students to assess the students' self-reported confidence levels in their ability to educate children about chiropractic. An assignment was given requiring the students to create a project that would help educate the pediatric patients about their spine and nervous system. After completion of the projects, a postsurvey was given to reassess the students' confidence levels.

### RESULTS

The pre- and postsurveys were completed by 22 (11 males, 11 females) students. The presurvey showed that over half of the students ( $n = 12$ ) felt only somewhat confident or not confident at all when educating children about chiropractic. The postsurvey data showed more than three-fourths of the students ( $n = 17$ ) increased their score to confident or very confident, while less than one-third of the students ( $n = 5$ ) remained somewhat confident or not confident at all in their ability to educate children about chiropractic.

### CONCLUSION

The study results suggest that this type of teaching method can be successful. More importantly, it was evident that most students felt more confident and more prepared when attempting to educate children about chiropractic.



# Effect of Lateral Cranial Translation on the Appearance of the Atlanto-occipital Joint

**Patricia Kuhta**, DC, and **Edward F. Owens, Jr.**, MS, DC, Palmer Center for Chiropractic Research

## INTRODUCTION

Lateral head translation can occur inadvertently during patient positioning for upper cervical radiographs. The goal of this study was to determine whether an imposed lateral head translation produced any change in the measurement of atlas laterality measured from the radiographic film analysis.

## METHODS

The project was approved by the college's IRB and took place in the outpatient clinic. Subjects were between the ages of 18 and 58 and were already scheduled for an upper cervical radiographic series. A six-view cervical x-ray series was taken, consisting of a neutral APOM, right translation APOM, left translation APOM, nasium, base posterior, and lateral cervical. For the translated APOMs, the patient translated his or her head to the right or left as far as comfortably possible. Three faculty doctors marked anatomical structures on the occiput and atlas and made three measurements related to the atlanto-occipital overlap.

## RESULTS

Forty-nine patients were recruited for the study. Three x-ray analysis factors were tabulated: A/O joint difference, lateral mass difference, and atlas tips difference. Interexaminer reliability of the x-ray factors was substantial to almost perfect (ICC = .65-.91). A one-way analysis of variance (ANOVA) showed a statistically significant relationship between head position and the A/O joint difference measure. Active head translation to the left produced an average change of 1.42 mm from neutral, and rightward translation resulted in an average 1.31 mm change in the A/O joint width difference ( $p < .001$ ).

## DISCUSSION CONCLUSION

Based on the results of this study, we can say that improper lateral head translation during radiographic setup can change the atlas laterality listing. Proper patient positioning and proper instruction of patients during positioning for the APOM and nasium films should be strongly emphasized in chiropractic cervical radiographic positioning courses.



# Ethics and Technology A Survey of Chiropractic College Clinic Constituencies

**Cynthia J. Lund**, CT, and **Michael Pryor**, DC, MBA, Life University

## INTRODUCTION

Ethics and technology are arguably the oldest and newest of topics discussed in business and academia. These topics may seem unrelated but can be logical companions to answer research questions. The influence of a virtual world on everyday activities may create an environment where behavior is not easily judged. Chiropractic college clinic

constituents face ethical dilemmas in a multiplicity of cultures. Awareness of differences and similarities among clinic groups can help encourage self-reflection about ethics and moral relativism and can be helpful when designing effective content of training and development programs. This paper presents a snapshot of the perceptions of four clinic groups regarding individual ethical behaviors, awareness of technology and its applications, and role modeling.

## METHODS

A literature search was performed and a survey instrument designed and submitted to the University's Institutional Review Board (IRB). Approval was granted by the IRB. The survey was administered to clinic faculty and administrators, clinic staff, entering DC students, and graduating DC students.

## RESULTS

Results of the 19-item survey exist in table and graph format listing mean, median, mode, and standard deviation. For this paper, four categories of data are presented. Although results do not show strong variance among groups, each category has interesting comparisons of self-reported proficiency

and relevance of technology and its ethical breaches, personal integrity, and role modeling. Examining limitations of the study raises questions about the accuracy of responses and response rates, when the survey is one that addresses sensitive issues.

## CONCLUSION

In this chiropractic college clinic setting, there is much to explore about the ethical environment and the roles, responsibilities, and self-perception of its constituents. Professional development programs, already begun, and the ongoing crafting of a University honor code can provide needed clarity of individual definitions and meaning of ethics and integrity.



# Interrater and Intrarater Reliability of Static Paraspinal Surface Electromyography

**Matthew McCoy**, DC, Life University, **Ian George**, BA, **Nicole Jastremski**, MSc, MA, **Lauren Butaric**, MA, and **Robert Blanks**, PhD, Florida Atlantic University

## OBJECTIVE

The objective of this study was to evaluate the interrater and intrarater reliability of static paraspinal surface electromyography.

## METHODS

The static paraspinal surface electromyography functions of an Insight Subluxation Station were evaluated for clinical reliability. Following approval of the project and the consent process by the Institutional Review Board of Life University, 91 university students were recruited by announcements and personal contacts. Two practicing chiropractors trained in the use of paraspinal surface electromyography conducted the scanning. The two examiners, blinded from data collection, scanned subjects according to the protocols established by Kent and Gentempo. The protocol involves static paraspinal sEMG scanning using hand-held electrodes in the seated position at 15 paired sites (4 cervical, 7 thoracic, 3 lumbar, and 1 sacral). Each subject was scanned twice by each examiner at one sitting.

## RESULTS

Principal component analysis (SPSS) was conducted on left/right averaged data and points. Statistical comparisons were made across the two observers, two repeated measures for each observer, and 15 sEMG points from C1 to S1. The averaged left/right values were subjected to multiple regression-principal component analyses and revealed intraclass correlation coefficients for intraexaminer and interexaminer to be 0.9527 and 0.9535, respectively. The Cronbach alpha for intraexaminer and interexaminer was found to be 0.9526 and 0.9558, respectively. The latter indicates a high degree of internal consistency reliability across the 15 data points per patient and two separate measures. A 95% confidence interval for intrarater revealed lower and upper limits of 0.9377 and 0.9656, respectively, and for interrater showed 0.9388 and 0.9662, respectively.

## CONCLUSION

There have been some studies done to address the reliability of sEMG techniques; however, larger studies were needed. This study revealed excellent interexaminer and intraexaminer reliability of static paraspinal surface electromyography in a large number of subjects.



# Utilizing Cooperative Learning to Develop Integrated Case Management Skills

Jason G. Napuli, DC, MBA, New York Chiropractic College

## INTRODUCTION

Traditionally, the clinical education for upper trimester students consisted of didactic lecture regarding case management of common clinical presentations in practice. These case studies were considered grand round style presentations which were delivered by clinical faculty members. In order to transition from a clinician-centered to a student-centered environment, cooperative learning was incorporated with the goal to allow the students to become more active in their learning process.

## METHODS

Students in 8th trimester met one time a week for 15 weeks and were randomly assigned into groups with a clinical topic. They were required to develop a case management plan and presentation for colleagues. Students were required to submit a synopsis of their presentation and the information was placed onto a CD-ROM for the whole class to utilize as future reference. A student perception survey was distributed.

## RESULTS

Students reported having gained an increased knowledge

of conditions seen in practice, case management, research and independent preparation of material, using evidence-based methods, the ability to seek out journal articles and current research trends in health care, and knowledge of treatment methods used by other health care practitioners.

## DISCUSSION

Student perception of the addition of cooperative learning into case presentations and clinical management suggests an increase in the ability to utilize knowledge and independently gather information. Students also were able to enhance their presentation skills with feedback provided for improvement.

## CONCLUSION

Cooperative learning can be an effective method for teaching clinical case management skills. This is only a preliminary study; more research should be done to further investigate this topic.



# Evaluation of Standing Posture as Rotations and Translations in 3D Interexaminer and Intraexaminer Reliability of the PosturePrint

**Martin C. Normand**, PhD, DC, **Donald D. Harrison** PhD, DC, MSE, **Martin Descarreaux**, DC, PhD, Université du Québec à Trois Rivières, **Deed E. Harrison** DC, Private Practice, **Denise L. Perron**, DC, Posika Ltd, **Joseph R. Ferrantelli**, DC, Private Practice, and **Tadeusz J. Janik**, PhD, MSE, CompMath R&C

## INTRODUCTION

Few digitizers can measure the complexity of upright human postural displacements (6 *df*) of the head, rib cage,

and pelvis. The purpose of this study is to evaluate reliability of a posture digitizer in determining rotations and translations of the head, rib cage, and pelvis in upright stance.

## METHODS

Forty volunteer subjects were examined with a posture digitizer twice by three investigators with a 1-day delay. Three digital photographs (left lateral, AP, right lateral) of each subject were obtained. Investigators placed 13 markers on anatomical points of the subjects and, using the computer mouse, chose an additional 16 anatomical points on the photographic images. Data were sent through the PosturePrint Internet computer system for determination of head, rib cage, and pelvic postures as rotations in degrees and translations in millimeters.

## RESULTS

Mean absolute differences within observers and between observers were 3.2° or less and 3.5° or less for all rotations and 7.1 mm or less and 8.4 mm or less for all translations, respectively.

## DISCUSSION

The PosturePrint postural digitization system has been found to have high reliability. The combined 44 interexaminer and intraexaminer correlation coefficients were in the good (14/44) and excellent (30/44) ranges for clinical research. SEMs and mean absolute differences within and between observers' measurements were small.

## CONCLUSION

The results of this study indicate that the clinical use of the PosturePrint in determining abnormal posture is highly repeatable.



# Management of Mechanical Back Pain in a Patient With Carcinoma of the Bladder

**Paul J. Osterbauer, DC, MPH,** Northwestern Health Sciences University

The purpose of this case report is to illustrate the potential role of chiropractic care to assist patients with multimorbidity.

## CLINICAL FEATURES

A 71-year-old homemaker presented with chronic lower back and leg pain (severity 5/10) and ambulated using a motorized scooter. Her global quality of life was 65/100 using the Euroqual questionnaire. A lower back fusion, 10 years earlier, and epidural steroid injections provided temporary relief. The pain was worsened by movement and her walking distance was limited to one block. She relied on rest and two to three Tylenol #3 per day to manage her pain. The patient's health problems included: active bladder carcinoma, diabetes, hypertension, fecal/urinary incontinence, left knee replacement (twice), cervical radiculopathy, hypothyroidism, emotional abuse, and hearing/vision loss. Relevant physical findings included: positive Babinski sign in the lower extremities; loss of her patellar and Achilles deep tendon reflexes bilaterally; normal motor strength bilaterally; normal light touch sensation for her lower extremity dermatomes; and palpatory tenderness +3/3 in the L5/S1/sacroiliac regions, from T6 to T2 and the suboccipital regions. Her muscle

tension was 5/5 in these regions. The presumptive diagnosis was spinal stenosis with associated mechanical dysfunction of her spine. Concern of metastasis led to coordination with her internist for appropriate follow-up. Imaging studies were requested from her internist and results are pending.

## INTERVENTION AND OUTCOME

A 2-week trial of therapy ensued with instrument-assisted adjusting. To facilitate comfortable transfer and treatment, care was delivered with the patient seated. At 2 weeks, her lower back pain was a severity of 2/10 and midback pain was 0/10. She eliminated the Tylenol during this period as well.

## DISCUSSION

Comanagement of patients with complex conditions remains largely unexplored in chiropractic practice. The findings may serve to design formal qualitative/quantitative studies to support the role chiropractic can play for patients with multiple diseases.

# Public Health Education A Traditional Approach

Irene N. Paulavicius, Palmer College of Chiropractic

## INTRODUCTION

There has been considerable variability in public health education within the chiropractic colleges. With the establishment of the Council on Chiropractic Education (CCE) standards for wellness (February 2007) competencies, hopefully a more standardized approach will be adopted. The knowledge portion of the CCE competencies for wellness coincides with a new teaching approach to public health adopted by Palmer College of Chiropractic.

With the implementation of *Healthy People 2000*, the paradigm shift from communicable to noncommunicable diseases and lifestyle choices as the major antecedent for morbidity and mortality became apparent. The challenge faced by Palmer was the means by which to address these issues in a curriculum highly regulated by external pressures and time limitations.

## METHODS

To engage students as active participants in the learning process, a traditional approach to education was implemented. A textbook was selected and reading assignments were specified. Instead of attending class three times per week, students were required to attend one discussion session. Grade points assigned on the basis of attendance and participation equal those assigned to exams.

## DISCUSSION

The intent was to reduce stress, involve the student in the learning process, and allow for the exchange of ideas among peers. Student familiarity with HP2010 Leading Health Indicators was determined before and after the course and an assessment of student satisfaction with the course was conducted.



# The Flipped Meniscus Variation of a Bucket-Handle Tear A Case Report

Jean-Nicolas Poirier, DC, Parker College of Chiropractic

## INTRODUCTION

Meniscal injuries frequently result from twisting strains applied to the knee when it is either flexed or fully extended. The anterior flipped meniscus, a variation of the bucket-handle tear, is observed when a posterior meniscal fragment is displaced anteriorly while remaining attached to the central portion of the meniscus. The fragment is flipped (inverted) and becomes trapped over the anterior horn of the involved meniscus. A case report of anterior flipped meniscus is presented. The clinical presentation, examination, imaging findings, and treatment considerations are discussed.

## CLINICAL FEATURES

A report of a young male who suffered an injury to his left knee is presented. The clinical suspicion of meniscal and ligamentous tears warranted a magnetic resonance examination. A full-thickness tear of the anterior cruciate ligament (ACL) and an anterior flipped meniscus were identified.

## INTERVENTION AND OUTCOME

After consultation with an orthopedic surgeon, the patient underwent an arthroscopic surgery where partial meniscectomy and ACL reconstruction were performed. The patient regained normal function within 5 to 6 months.

## DISCUSSION

The condition described represents a variation (subcategory) of a bucket-handle tear.

Although the presence of a meniscal injury can often be identified clinically, the determination of the precise location, type, and extent of the tear is not usually possible on the basis of clinical evaluation alone and magnetic resonance imaging

is the imaging modality of choice to characterize these injuries. Multiple magnetic resonance imaging signs have been described and evaluated to increase the sensitivity and specificity of this examination in regards to bucket-handle tears. The treatment options vary between a conservative approach, meniscal repair, partial meniscal resection, partial or complete meniscal reconstruction, or meniscal transplantation.



## Obesity-Related Spinal Epidural Lipomatosis A Case Report

**Jean-Nicolas Poirier**, DC, **Aislin M. Gerow**, RN, and **Stephanie M. Janiak**, BSBA,  
Parker College of Chiropractic

### INTRODUCTION

Epidural lipomatosis represents an unusual cause of spinal canal stenosis. The presented case addresses the importance of adequate clinical evaluation, imaging findings, and therapeutic considerations in this infrequent condition.

### CLINICAL FEATURES

The case of a 54-year-old moderately obese male with sudden lumbosacral radicular symptoms is presented. The clinical suspicion of a herniated disc refractory to chiropractic manipulation warranted a magnetic resonance imaging (MRI) examination of the lumbar spine. The imaging evaluation demonstrated an excessive quantity of lumbosacral epidural adipose tissue leading to a “Y”-shaped deformity of the thecal sac. He was diagnosed with obesity-related spinal epidural lipomatosis.

### INTERVENTION AND OUTCOME

The patient was successfully treated with conservative care. He remained pain free without surgical intervention at follow-up 3 years later.

### DISCUSSION

Spinal epidural lipomatosis is most commonly observed in patients receiving long-term exogenous steroid therapy. It can also be seen in patients with endogenous steroid overproduction, obesity, or as an idiopathic form. Although this condition is often asymptomatic and found incidentally on a magnetic resonance imaging examination of the spine performed for other reasons, many patients can be affected with symptoms of spinal stenosis. The treatment should be directed toward the cause of adipose proliferation. For obese patients, calorie-controlled diet, exercise, and weight reduction have shown benefits in some patients to reduce the quantity of epidural fat and relieve the thecal sac compression. The presented patient was successfully treated with chiropractic manipulations and other conservative methods.





# Avascular Necrosis and Clinical Documentation A Case Study

**Renee M. Prenitzer, DC**, Sherman College of Straight Chiropractic

## INTRODUCTION

Causes of avascular necrosis include corticosteroid use and trauma. This study demonstrates how detailed clinical documentation can prove beneficial in clinical decision making and treatment protocols.

## CLINICAL FEATURES

A 72-year-old female patient developed avascular necrosis of the acetabulofemoral joint. Detailed documentation performed throughout her care resulted in early intervention and comanaged care. The initial history indicated no major health concern except a history of allergies treated with corticosteroids and a history of a fall which resulted in occasional left acetabulofemoral pain.

## INTERVENTION AND OUTCOME

The patient had a left positive Patrick's test. Light force adjustments to cervical, thoracic, and lumbopelvic spinal

regions were approved for one to two times per week for a 3-month period before review and update were performed.

Subjective findings were documented at each visit. The second visit documented one incident of slight left acetabulofemoral pain and then no further incidents until limping was noted 3 weeks before the scheduled review and update. Subsequent documentation indicated the patient received a cortisone injection into her left gluteal/hip region with mixed results.

The major health concern was modified to left acetabulofemoral pain on the case update. Additional x-ray views focused on both acetabulofemoral joints revealed possible avascular necrosis, which, along with the change in complaint, led to a hip MRI referral, the results of which indicated avascular necrosis. A referral to an orthopedist was made and a total left acetabulofemoral joint replacement was performed 14 months later.

## DISCUSSION AND CONCLUSION

This case illustrates the importance of detailed documentation and timely update and review of case history, during patient care, in order to provide proper management and comanagement.

# Conversion to Digital Imaging

**Kerri Duggins Rames, DC**, Life Chiropractic College West

## INTRODUCTION

The conversion to digital imaging can be a daunting process to chiropractic educational institutions that are used to tried and true plain-film radiography methods. This paper describes one chiropractic institution's experience with making this conversion.

## PURPOSE

The purpose of this paper is to tell the story of how Life Chiropractic College West made the conversion from plain-film radiography to digital imaging. It is written to answer basic questions of how digital imaging works in a busy health care center with many faculty and interns.

Included is information of how this imaging is used in the classroom for instruction and technique labs for diagnostic use.

## CONCLUSION

The benefits of conversion to digital imaging greatly outweigh the difficulties of implementing this high-tech solution. The enhanced image quality and the ability to manipulate images, the speed of use for the new systems, and the greatly reduced number of retakes are the primary advantages to digital imaging.

# Triage in a Chiropractic Pediatric Setting

**Drew Rubin, DC**, Life University

## BACKGROUND

Taber's *Cyclopedic Medical Dictionary* states that "triage categories include P-1 (immediate referral), P-2 (cautionary), P-3 (limited concern)." The use of triage in a chiropractic practice is to determine whether or not a case that has presented to an office is in need of a referral or is of less concern.

## OBJECTIVE

The purpose of this paper is to illustrate the importance of triage skills in a primary care, chiropractic pediatric practice. This is examined both in the new patient setting as well as during visit-to-visit protocol.

## METHOD

An analysis of the number of triage visits during a 1-year time period was performed on 48 new children or pregnant women and 1634 existing pediatric and pregnancy visits.

## RESULTS

The average level of triage for a new patient, whether pediatric or pregnant, was P-3, with over 85% of new patients falling into that category. Fifteen percent were at a P-2 level; there were none at the P-1 level. Between 12% and 15% of the total of existing pediatric or pregnancy visits were at a P-1 or P-2 level of triage. Eleven percent of the total of pediatric triage visits was of the P-1 level.

## DISCUSSION

New patients rarely come to a pediatric office in a P-1 level crisis, whereas existing patients have a much higher likelihood of presenting during a P-1 challenge. P-2 triage levels are somewhat common, while P-3 triage levels are the most frequent.

## CONCLUSION

Triage methods are a way to help place a patient in a category that can ensure an optimum, safe, and effective level of care.



# Student Mental Health in a Chiropractic University Setting

**Lisa Rubin, PhD**, Life University

## BACKGROUND

Since Life University established a Student Success Center (SSC) in July of 2003, an increasing number of students have utilized its counseling services. These sessions seem to fall into certain predominant and recurring categories.

## OBJECTIVE

This report is an attempt to frame the types of emotional challenges seen at a university counseling center with a

unique population of chiropractic students and to determine whether these challenges differ from those of the normative college population.

## METHOD

The numbers of students were tallied to determine the population that has utilized psychological counseling over the last 3 years at Life University. The sample of students was from the College of Chiropractic and the College of Arts and Sciences who are pursuing a DC degree.

## RESULTS

Mood issues were the number one issue pursued over a 2-year period. Relationships were the second highest category of attended psychological sessions. The third highest rating was for substance use concerns.

## DISCUSSION

Life University's Counseling Center's top three issues pursued for counseling are consistent with the research of

mental health issues on college campuses. The number of sessions per quarter has grown from 44 to 126 over a 21/2-year period, indicating the demand for such services on a chiropractic campus. The number of individuals seeking counseling has also grown per quarter, from 8 to 47.

## CONCLUSION

Counseling services at our university are an integral part of the institution, as is evidenced by our data and by observing statistics from other college settings.



# Gait Analysis of Patients With Low Back Pain, Before and After Spinal Manipulation A Preliminary Report

**Brent da Silva Russell, DC**, Life University College of Chiropractic and Georgia State University

## INTRODUCTION

It is not unusual for patients to complain of gait alterations as part of their decision to see a chiropractor. Many chiropractic textbooks discuss visual analysis of gait as a standard examination procedure, often implying that abnormalities will improve with chiropractic treatment. Because spinal manipulation (SM) is helpful with low back pain (LBP), and patients with LBP often have abnormal gait, we could reasonably expect SM to have an effect on gait. The purpose of this paper is to review the research in this area and to present a case study.

## DISCUSSION

There have been only a few studies of the effect of manipulation on gait, in the late 1980s and early 1990s. Restricted to sacroiliac joint manipulation and analysis only of symmetry, the limited methods may have contributed to mixed results

and have provided little evidence to support expectations. Later studies have found patients with LBP to have shorter step length, stride-to-stride variability, altered pelvic-thorax coordination, and increased erector spinae muscle activity. In the included case study, the gait of a 49-year-old male with "foot drop" was assessed with a force platform before and after two sessions of flexion distraction and side-posture manipulation.

## CONCLUSION

Because walking is such a fundamental activity, the use of gait analysis could be very important applied research on the effects of manipulation. Manipulation might be better understood as a therapeutic method if a clearer relationship could be demonstrated with patterns of gait and movement. Future research in this area should examine patients with more severe pain levels and assess other parameters of gait, and other areas of the spine and/or extraspinal areas should be included in treatment of such patients.



# Effect of High-Heeled Shoes on Lumbar Lordosis

**Brent da Silva Russell, DC**, Life University College of Chiropractic and Georgia State University

## INTRODUCTION

High-heeled shoes are popularly believed to aggravate low back pain by causing an increase of the lordotic curve of the lumbar spine. The purpose of this paper is to compare sources aimed at the general public, peer-reviewed literature, and a biomechanical case study. Because low back pain and high heels are both quite common, this has implications for evidence-based care and best practice issues of chiropractic.

## METHODS

I conducted an Internet search for popular sources and searches for peer-reviewed publications, using the keywords *high heels* and *high-heeled* combined with the words *lumbar lordosis*, and *pelvic tilt*. For the case study, photographs of one subject were analyzed with Dartfish biomechanical analysis software.

## RESULTS

My Internet search turned up between 30 and 40 sources aimed at the public, from chiropractors, medical doctors, physical therapists, and athletic trainers, claiming heels to

increase lordosis. The Internet may underrepresent a common verbal caution; other investigators believe increased lordosis to be a nearly universal perception. Published literature mostly does not support common wisdom; most studies have found lumbar lordosis to be lessened or unchanged with high heels, with some exceptions for younger women. In the case study, a 21-year-old woman exhibited decreased lordosis with 6.3-cm heels.

## DISCUSSION

Other research has found inaccuracy in visual perception of lordosis, as influenced by external body contours. Given the inconsistency of study methods, conflicting results, and few numbers of subjects in previous investigations, there are potential areas for further research.

## CONCLUSION

Although it appears that high-heeled shoes do not increase the lumbar lordosis for most women, there are some remaining questions. It would be helpful for clinicians to have a clear answer for this issue. This is an area that deserves further investigation.



# The Use of Shock Wave Therapy as a Preventative Measure for Nonunion of the Scaphoid A Case Report and Review of Literature

**Sandy S. Sajko, MSc, DC**, **Mohsen Kazemi, RN, DC**, Canadian Memorial Chiropractic College, and **Herbert Von Schroeder, MD, MSc**, University of Toronto Medical School

## INTRODUCTION

Missing a scaphoid fracture or inadequate treatment is known to contribute to a high nonunion (pseudarthrosis) of the fracture. This case report documents a proximal pole scaphoid fracture that was treated by surgical reduction and

fixation, followed by extracorporeal shock wave therapy to achieve rapid healing of the fracture.

## CASE REPORT

A 23-year-old national level hockey player sustained a right wrist injury while falling into the boards. There was a marked reduction in all ranges of motion and end range radial deviation seemed to aggravate the symptoms most. Point tenderness was noted over the snuffbox region, but there was none reported over the rest of the carpal bones or the distal radius. Radiographs taken 11 days after the incident revealed a proximal pole fracture of the scaphoid and the patient was subsequently scheduled for surgery the same day. An open reduction and fixation of the scaphoid with a radial bone graft was performed. Once the cast was removed, the patient followed a strict progressive rehabilitation that included isometric and concentric exercises, carpal mobilizations, various physical modalities for pain and tissue repair, soft tissue therapy, and extracorporeal shock wave therapy (ESWT). The ESWT was administered once a week for a 3-week period. The scaphoid was treated with a treatment pressure of 2.5 bar, an impulse frequency of 4-12 Hz, and the number of impulses was 500/session. Significant improvements were found in grip strength (33% increase) and pain

(43% decrease), and all ranges of motion improved by an overall average of approximately 31%. Radiographs were repeated at 1, 2, 3, and 6 months postinjury, and at 3 months, the fracture lucency was no longer visible on radiographs.

## DISCUSSION

A review of literature of the principles, methods, bone healing mechanisms, and clinical applications of ESWT is given.

## CONCLUSION

This case report is the first to suggest that the use of extracorporeal shock wave therapy may have beneficial therapeutic effects in preventing avascular necrosis and/or nonunion of scaphoid fractures.



## Developing a Survey for Needs Assessment A Case Study

**Jon Schwartzbauer, DC, Laura Chadwick-Weeks, DC, and John Hart, DC,** Sherman College of Straight Chiropractic

## INTRODUCTION

The survey method has been shown to be useful in exploring a needs assessment in chiropractic education. An in-house survey was developed to assess student needs relative to leadership and practice management at Sherman College.

## METHODS

A 22-question survey was developed by the first two authors. Students in 12 quarters (out of 13) at Sherman College were surveyed regarding their perceived leadership and practice management needs. Reliability of the survey was assessed using the intraclass correlation coefficient (ICC) by comparing similar questions to each other. An ICC score of 0.600 was deemed as acceptable.

## RESULTS

A total of 210 students were surveyed. Questions 14, 15, and 18 did not show acceptable reliability ( $<0.600$  ICC), whereas all other questions did ( $>0.600$  ICC). There was an overall interest in leadership and practice management needs from the viewpoint of students. For example, 93.3% of the respondents "strongly agreed" or "agreed" that the college should have a practice management resource library (books, brochures, DVD, etc) for its students.

## DISCUSSION

The questions showing unacceptable reliability can either be reworded and used in a separate survey or omitted, while those showing acceptable reliability can remain in the survey for future survey administrations. Questions with acceptable reliability provided responses consistent with respondents having a high level of interest in the topic.

## CONCLUSION

This needs assessment survey is reliable for most questions and provided information regarding the level of interest

for the question asked (regarding leadership and practice management needs of the student). Follow-up surveys will either omit the unreliable questions or include the questions in reworded formats with follow-up reliability analyses.



# A Comparison Study Between the Use of a Combined Educational Delivery Method and Traditional Lecture

**Michael W. Shreeve**, DC, **Medhat Alattar**, MB, MS, DC, and **Christopher Meseke**, MS, PhD, Palmer College of Chiropractic Florida

## BACKGROUND

With few chiropractic studies published on hybrid curricula, there is a need to assess such delivery methods that integrate the traditional lecture-based delivery with the affective domain as well as the cognitive domain of learning and to incorporate the concepts of appreciative inquiry.

## OBJECTIVES

The objectives of this study are: 1) to utilize an adult-based learning (ABL) approach that fosters critical thinking to enhance the knowledge of the auditory, visual, and kinesthetic learners; and 2) to compare an ABL model combining traditional lecture, experiential learning theory (ELT), and appreciative inquiry (AI) to a traditional lecture-based learning (LBL) delivery method.

## METHODS

This study was conducted over two consecutive quarters with class sizes of 46 and 71 students. Three distinct topics were taught: two topics with a combined educational delivery approach with peer and instructor feedback using appreciative inquiry concepts and one with a didactic approach. Data were collected using anonymous, voluntary WebCT surveys

with Likert-type scale to assess the individual reflection of the learning experience and the student self-assessment of confidence levels and attitudes. The results of summative student assessments in all three topics were also analyzed.

## RESULTS

Analysis of the written summative examinations demonstrated higher scores in the topic areas which employed an ABL model with combined educational approaches. Student self-assessment of confidence and attitude ranked high.

## DISCUSSION

The use of an ABL approach that combines lecture with learning activity and inquiry concepts may allow students to achieve better transference of knowledge through actual experience and reflection of that experience.

## CONCLUSION

The chiropractic curriculum is well suited to a hybrid educational approach that incorporates didactic and psychomotor skills addressing the affective domain as well as the cognitive domain of learning.



# Effect of Logan Basic Technique on Blood Pressure and Pulse Rate in a Student Population

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

## INTRODUCTION

This study was designed to investigate blood pressure and heart rate changes before and after a Logan basic chiropractic adjustment. The null hypothesis was that Logan basic technique adjustments would not induce positive changes in blood pressure and pulse rate.

## METHODS

This was a randomized controlled study with 100 subjects assigned to either the experimental ( $n = 50$ ) or control groups ( $n = 50$ ). The experimental group's ( $n = 50$ ) blood pressure and pulse was recorded before and after the Logan basic adjustment. The Logan basic adjustment consisted of the apex and notch contacts.

## RESULTS

One hundred students were recruited from a chiropractic

college student body to participate in this study. The average age of the experimental group was  $27 \pm 5$  years old, and the average age of the control group was  $28 \pm 8$  years old. The systolic blood pressure was significantly reduced ( $p = .002$ ) with a recording before the adjustment of  $111 \pm 8$  mm Hg and a recording of  $108 \pm 8$  mm Hg after the adjustment. The diastolic blood pressure was reduced ( $p = .083$ ) but did not reach a significant level, with a recording before the adjustment of  $69 \pm 7$  mm Hg and a recording of  $68 \pm 8$  mm Hg after the adjustment. The pulse rate was very significantly reduced ( $p = .0002$ ), with a recording before the adjustment of  $71 \pm 10$  and a recording of  $67 \pm 10$  after the adjustment.

## CONCLUSION

The present randomized controlled study of the Logan basic technique showed a significant decrease in blood pressure and pulse rate. This study demonstrated a potential benefit of the Logan basic technique adjustment on decreasing blood pressure and pulse rate.

# Effect of the Toffness System of Chiropractic Adjusting in Adults With Scoliosis A Pilot Study

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

## OBJECTIVE

This project is designed to investigate the effects of the Toffness System of Chiropractic Adjusting on adults with scoliosis.

## METHODS

This project is a pilot study of 15 adults who meet inclusion criteria.

The Oswestry Disability Index (ODI) is one of the most commonly used and accepted outcomes measures for low back pain. The minimal clinically important difference (or change) of the ODI has been determined to be 10. Its standard error of measurement is 4. The gold standard of measurement of the lateral curvature in scoliosis is

the Cobb angle. Interobserver error in measurement ranges from 2.8° to ±7°. A difference of 5° is considered significant.

## RESULTS

The Toftness System of Chiropractic Adjusting effected no statistically significant changes in Cobb angle, ODI score, or visual analog scale (VAS) score after a series of 36 treatments. Although not part of the original study, it was

noted that a measurement of spinal balance, deviation of the odontoid from the sacral vertical line, was found to decrease significantly ( $p = .02$ ) in all seven subjects, with an average reduction of 8.29 mm.

## CONCLUSION

The Toftness System of Chiropractic Adjusting resulted in no statistically significant changes in Cobb angle, ODI score, or VAS score after a series of 36 treatments.



# The Meric System—Myth or Mechanism?

**Gene S. Tobias**, PhD, DC, **David Sikorski**, DC, and **Anupama Kizhakkeveetil**, BAMS, Los Angeles College of Chiropractic, Southern California University of Health Sciences

## INTRODUCTION

The Meric System was initially developed by D.D. Palmer and James C. Wishart at the Palmer School of Chiropractic. Body zones innervated by specific pairs of spinal nerves were identified and the muscles (myomeres) and organs (viscemereres) served by these spinal segments were mapped. The Meric System concept was that spinal subluxation would manifest as disease in the associated viscera and muscles. Survey data from 1998 indicate that nearly 20% of practicing chiropractors in the United States use the Meric technique, and the technique is still taught in core curricula of some chiropractic colleges.

## METHODS

We searched the scientific literature to identify clinical trials investigating the effects of spinal manipulation on visceral organs in humans. We required that such studies meet two criteria:

1. Spinal manipulation applied to subjects in the study should be at specific spinal levels that correspond to the autonomic innervation of a particular visceral organ; and
2. Outcome measures should correlate with the expected functional changes for the same visceral organ.

## RESULTS

We identified 13 clinical trials: 6 studies on blood pressure or the heart, 4 on asthma or respiration, and 3 on dysmenorrhea. Four of these studies met both criteria. Three of the studies reported significant effects of spinal manipulation.

## DISCUSSION

The Meric System has been broadly touted over most of the history of the chiropractic profession. While a number of clinical trials have investigated the effects of spinal manipulation on visceral organs, only a few trials have been designed to test the effects of manipulation at spinal levels that specifically correspond to the innervation of organs whose functions are being evaluated.

## CONCLUSION

The Meric System is a reasonable hypothesis to explain some effects of subluxation on visceral organs. Additional controlled clinical trials should be designed and conducted to test this hypothesis.





# Patient Expectations for Chiropractic Care Developing Consensus Within the Profession: Initial Findings

**William Updyke**, DC, Palmer College of Chiropractic West, and **Gary Schultz**,  
Western States Chiropractic College

## INTRODUCTION

While some work has looked into doctors of chiropractic approaches to patient care, there remains a lack of agreement on the basic elements of patient care. This paper compiled opinions from within the chiropractic profession to come to consensus about the basic components of what patients should expect when they are seen by a doctor of chiropractic.

## METHODS

An open comment data-gathering process was used to gain consensus among a large group of chiropractors on what patients should expect when they enter a chiropractor's office. A chiropractic state association initiated the process. Two seed documents were created: one for new patients and the other for returning patient visits. Several rounds of reviews were undertaken and the documents revised after each round.

## RESULTS

Three consensus draft documents were created. They were titled: What patients should expect during a regular visit to

a doctor of chiropractic; What new patients with a health concern should expect when they visit a doctor of chiropractic; and What to expect when you visit a doctor of chiropractic if you do not have a specific health problem but you are interested in improving your health.

## DISCUSSION

Members of the chiropractic profession can agree on an approach to patient care. In this example, a state chiropractic association took steps to create an inclusive consensus document that will be helpful to individuals seeking information about chiropractic.

## CONCLUSION

A chiropractic professional association can initiate a consensus discussion within the profession that can help to define what patients can expect when they enter a doctor of chiropractic's office. Further research will be needed to evaluate the validity of the results.



# Lumbar Spine Radiographic Changes After an Initial Treatment With an Impulse Adjusting Instrument in a Female Patient With Low Back Pain

**Janeen L. Wallace**, DC, Private Practice

## OBJECTIVE

The purpose of this paper is to demonstrate and quantify structural changes of the lumbar spine observed on the anteroposterior (AP) radiographs of a low back pain patient before and after an initial treatment with an Impulse adjusting instrument.

## CLINICAL FEATURES

A 26-year-old female presented with chronic low back pain and bilateral hip pain. Significant findings upon physical examination included positive bilateral Kemp's and Yeoman's tests and a mild decrease in lumbar range of motion with dull pain. Lumbar radiographs demonstrate a mild thoracolumbar scoliosis, convex to the left with

an apex at L3 and facet anomalies at L4/5 and L5/S1 levels.

## INTERVENTION AND OUTCOME

The patient received interferential therapy at the lower thoracic and lumbar region bilaterally and low-force specific technique using the Impulse adjusting instrument. The patient returned in 2 days, at which time the lumbar AP radiograph was retaken prior to her second treatment because of a large metal artifact obstructing the midlumbar level. Comparatively, the AP lumbar curve had straightened. Measurements were performed on the digitized film and analyzed. Average

vertebral body rotation from T10 to L5 was reduced 75%. Average reduction in scoliosis from T10 to L5 was 9 mm posttreatment with most significant changes from T10 to L2 averaging a 13.6-mm reduction in scoliosis.

## CONCLUSION

This case contributes a rare comparison of radiographs before and after one chiropractic treatment which demonstrate a measurable correction of an AP thoracolumbar curve. Although these observations were made fortuitously due to an erroneous finding on the initial film, it is interesting to quantify the structural changes made after a single treatment.



# Laser Acupoint Treatment on Blood Pressure and Body Weight

**John Zhang**, MD, PhD, **Nelson Marquina**, DC, PhD, **George Oxinos**, **Amy Sau**, and **Derek Ng**, Logan College of Chiropractic

## INTRODUCTION

This research was designed to study the effects of laser acupuncture on blood pressure and body weight by stimulating acupuncture points and meridians on college students and faculty members. Forty-four subjects from a chiropractic college were recruited in the study.

## METHODS

All subjects signed a written informed consent prior to their participation in the study. This study was a randomized controlled study with subjects divided into control and experimental groups. The control group received a sham low-level laser treatment (LLLT) treatment with no power output to the laser during their "treatment." The experimental group was treated with an activated laser. The acupuncture points utilized in this study were ST 36 and LI 11 for body weight and LI 4 and LI 11 for blood pressure. The treatment groups received 16 Joules of laser energy output for a total treatment time of 8 minutes (4 minutes for each of the two points).

## RESULTS

After using the laser treatment for 90 days, both the systolic and diastolic blood pressure decreased significantly ( $p < .01$ ). The mean systolic blood pressure was  $125.6 \pm 14.4$  before the treatment and was reduced to  $119.1 \pm 18.8$  mm Hg ( $p < .01$ ). The mean diastolic blood pressure was  $83.3 \pm 7.8$  before treatment and was also reduced to  $73.6 \pm 9.203$  mm Hg ( $p < .01$ ). Subject's body weight was reduced in the body weight acupoint group, but the weight reduction did not reach significant level.

## CONCLUSION

It was concluded that low-level laser treatment of acupoint resulted in lower blood pressure by stimulating the ST 36/LI 11 and LI 4/LI 11. No significant body weight reduction was observed in both groups.



# Instrument-Applied and Manual Manipulation-Induced EMG Responses in Asymptomatic Subjects

**John Zhang**, MD, PhD, **Amy Sau**, **Derek Ng**, **Dennis Enix**, DC, **Kristan Giggey**, DC, and **Rodger Tepe**, PhD, Logan College of Chiropractic

## INTRODUCTION

This research was designed to study the effects of instrument-applied (ProAdjuster) and manual lumbar manipulation technique-induced paravertebral cervical surface electromyogram (sEMG) responses.

## METHODS

All subjects were tested three times using the Biopac sEMG system before and after instrument and manual chiropractic manipulations using the ProAdjuster and Diversified technique. On each day, subjects received either instrument or manual manipulation to the lumbar spine (L1-L5) as determined by the ProAdjuster system of analysis. EMGs were recorded before and after each adjustment in both groups.

## RESULTS

Forty subjects were randomly assigned into the instrument

and manual manipulation groups using a random table. Every subject signed an informed consent before beginning the study.

The first pattern was increasing in the EMG amplitude with an increase in adjusting force from 10, to 15, to 20 lb. In each stimulation period with the same force, the height of the EMG spikes was at the same level and less variable. This was seen in 33% of the recordings. The second pattern was showing low EMG amplitude at the start of adjustment and then the EMG amplitude went up and down with greater variation (10% of the recordings). The third pattern was showing a consistent decrease in EMG amplitude as the adjustment strength went up from 10, 15, and 20 lb (15% of the recordings). The fourth pattern was showing limited or no responses when the adjustment was provided (42% of the recordings).

## CONCLUSION

It was concluded that the instrument adjustment with varying frequency and forces produced sEMG spikes from a remote adjustment site. The spikes had four different patterns.