
Poster Presentations

Learning Through Internet Educational Games

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A new challenge facing chiropractic educators is the need to incorporate active learning strategies into their courses. Active learning techniques have been suggested to improve the learner's creative thinking and problem-solving skills. Reports suggest that multisensory teaching approaches help most students to effectively learn the subject presented. Among the techniques developed to fulfill this objective is the inclusion of games that usually satisfy the needs of tactile learners.

METHODS

A subscription to the Web site "Quia" (www.quia.com) provided templates that were used to develop educational games in several formats to emphasize the course material. Sixteen educational games were developed for reviewing concepts in the physiology and pathology of the immune, gastrointestinal, urinary, and reproductive systems; biomechanics of the lumbar spine; the abdominal examination; and clinical laboratory findings. The games were used in several classes over a period of 1½ years. The games included formats such as Matching, Flash Cards, Columns, Concentration, Rags to Riches, and Challenge Board. The games encouraged chiropractic students to compete against each other and to actively participate in the learning process. Data on the frequency of students' utilization of each game activity were collected. A simple questionnaire was developed and used to collect students' impressions and comments at the end of each quarter. The result of the summative examination

of a class before the implementation of the games was compared to the results of the summative examination of another class that had access to the games as a learning tool.

RESULTS

An evaluation of the students' responses documented that students enjoyed the active formats, like Challenge Board, more than the games that were concentrated on memorization (Matching, Flash Cards, Columns, Concentration). The students reported that overall the games enhanced their ability to understand and retain information. Results of the survey indicated that the students perceived these games as fun and that they added creative excitement to their learning experience. Comparing the summative examination results suggested that access to the games resulted in slight improvement in the overall performance.

DISCUSSION

Utilizing Internet educational games creates an active learning environment that may increase the learner's interest in the material presented during lectures. This may be considered an attractive tool to help and encourage some students to study definitions and concepts that are related to the course material.



Rubric Development to Measure Council for Chiropractic Education Competencies in Neuromusculoskeletal Examination

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The Council for Chiropractic Education (CCE) has set standards for skill and knowledge (e.g., CCE competencies) in neuromusculoskeletal examination which include the ability to choose appropriate testing procedures based on patient complaint, the ability to recognize and interpret significant findings, and the ability to choose appropriate confirmatory tests. Customarily, practical examination testing for orthopedic courses has been graded in a holistic fashion (all or nothing) in which the student must perform the test correctly, state the correct positive sign, and state the correct indication. This grading scheme does not provide a formative assessment to discriminate strengths and weaknesses. Analytical rubric scoring methods have been devised as formative assessments in education for this purpose. At Life University, College of Chiropractic, a work group was formed to develop individual class rubrics to assess strengths and weaknesses in these performance standards. The purpose of this paper is to describe the design and testing of a rubric scoring method for the practical testing for neuromusculoskeletal examination.

METHODS

Each of the 31 students was graded on performance by the usual holistic method. In addition, a formative assessment was utilized in an attempt to discriminate the student's ability to choose appropriate testing procedures, state the correct positive sign, state the correct indication, and choose appropriate confirmatory procedures using a rubric scoring method. In the rubric, knowledge levels were set such that the ability to demonstrate the preceding skills 70–79% of the time was basic, 80–89% was advanced, and 90–100% was mastery. CCE skill competency in use of equipment in neuromusculoskeletal examination was added. Basic competence was correct equipment use, advanced was safe use, and mastery

was hygienic use. Additionally CCE skill competency in patient interaction was included. Basic competence was the ability to give patient instructions during the exam, advanced was the ability to explain equipment use adequately, and mastery involved obtaining patient consent, demonstration of empathy, and recognition of the importance of confidentiality. The two scores and a combination of these scores for the 31 students in the class were compared to the overall score using a Pearson product-moment coefficient correlation and a multiple regression analysis in Excel.

RESULTS

The mean holistic score (grade) was 78%. The knowledge component mean was 79%, the skill component mean was 90%, and the mean for the combination skill and knowledge components was 82% for this convenience sample. The knowledge component of the rubric demonstrated a 0.73 correlation when compared with the grade, and the skill component demonstrated a 0.66 when compared with the grade. When combined knowledge and skill were compared with the student's overall score, the correlation was 0.80. The regression analysis compared skills and knowledge components against the overall score, giving $R = 0.81$ (standard error 7.13).

DISCUSSION

Student performance, as scored by these two methods, exhibits high correlation. The rubric scoring method is demonstrated to be an effective way to provide formative assessment of knowledge and skills in the neuromusculoskeletal examination.



Thoracic Manipulation Acutely Resets Heart Rate Variability in Asymptomatic Subjects

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The thrust applied during spinal manipulation can stimulate local mechanoreceptors and activate afferent impulses to initiate a somatovisceral reflex. In addition, freeing a spinal fixation by manipulation is believed to normalize transmission of nervous impulses through the affected segment. The authors postulate that these effects will at least transiently alter autonomic sympathovagal balance, as shown through heart rate variability (HRV). The purpose of this study was to assess whether there is an acute change in HRV in response to thoracic manipulation.

METHODS

HRV was measured in 28 asymptomatic individuals before and after application of a high-velocity, low-amplitude thrust to the appropriate transverse process, as determined by premanipulative palpation, with a diversified pisiform contact. Following a baseline session, each subject was studied in two sessions approximately 1 week apart. In random order, the upper thorax (T1–T4) was manipulated in one session, and the lower thorax (T8–T12) was manipulated in the other. The biomechanical characteristics of each thrust were measured using a custom-designed triaxial force transducer. HRV was determined from the electrocardiogram (ECG). The subject's breathing was measured with a piezoelectric elastic belt. With the subject in a prone position, the ECG and breathing were recorded for 10 minutes preceding ("pre"), and for 10 minutes following ("post") the manipulation. The low-frequency (LF, 0.04–0.15 Hz) and high-frequency (HF, 0.15–0.4 Hz) components of the HRV power spectrum were normalized against the total power minus the ultra-low-frequency component (<0.04 Hz).

RESULTS

In normalized units, a comparison of postmanipulation and premanipulation indicated that there was no change in

LF (41.9 ± 16.7 [SD] vs. 43.9 ± 22.4 , $p = .54$, upper thoracic; 41.6 ± 19.0 vs. 43.2 ± 19.4 , $p = .56$, lower thoracic) or HF (48.6 ± 16.6 vs. 47.5 ± 22.1 , $p = .69$, upper thoracic; 50.4 ± 21.1 vs. 47.2 ± 19.3 , $p = .22$, lower thoracic). In addition, there was no change in the LF/HF ratio (1.09 ± 0.74 vs. 1.57 ± 1.64 , $p = .09$, upper thoracic; 1.35 ± 1.81 vs. 1.41 ± 1.56 , $p = .67$, lower thoracic). However, a "normalizing" response to upper thoracic manipulation was observed in the LF and HF power, as well as in the LF/HF ratio, with postmanipulation values tending more toward their central value. This was evidenced by the interquartile range for the postmanipulation values being less than for the premanipulation values for LF (20.6 vs. 34.3), HF (24.2 vs. 37.1), and the LF/HF ratio (0.96 vs. 1.60). In addition, the magnitude of the response to upper thoracic manipulation was linearly dependent upon the initial premanipulation value ($R^2 = 0.45$, $p = .0001$ for LF; $R^2 = 0.44$, $p = .0001$ for HF; $R^2 = 0.79$, $p < .0001$ for LF/HF).

DISCUSSION

These results suggest that autonomic sympathovagal balance can be at least transiently reset by manipulation of the upper, but not lower, thoracic spine. Rather than a simple increase or reduction in HRV, the nature of the response to upper thoracic manipulation is of interest. The "normalization" that was observed is suggestive of the long-standing claim that chiropractic manipulation initiates a homeostatic response causing low premanipulation values to be increased, and high values to be reduced toward a central value suggestive of a physiologic set-point. Of equal significance is the finding that the strength of the response was linearly dependent upon the magnitude of the initial state, with a progressively greater response being associated with initial values that are further from the central value for this study population.



Academic Search Committees A Cooperative Approach

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The process for recruiting faculty and faculty administrators can vary from one search to the next, depending on the individuals making up the team and the dynamics operating within the team. Several intangibles also work into a recruiting effort such as bias, priorities, and vested interests. A fascinating strategy has been developed that integrates group work into the process and by doing so may reduce or even eliminate the intangibles. This strategy uses group work to balance opinions and to reduce inherent prejudices between and within the members of the group. In order to control variables in the search process, a cooperative approach was used in searching for a Dean for the College of Chiropractic at Life University, and the development of the process was recorded for use by future search committees.

METHODS

The Provost selected the chair and they met to compose the letter to selected faculty. The search committee consisted of two co-chairs and eight faculty and staff chosen from the various areas within the Doctor of Chiropractic Program (DCP). Applications were solicited through advertisements in professional journals and reviewed by the committee members. The committee members were assigned to one of two groups and each group was divided into two teams (as partners). A data table was developed to list three strengths and three weaknesses of each applicant. Selection of candidates for interview was made using the overall assessment of strengths and weaknesses (without ranking). Decisions were made by majority vote of the eight members, and in the event of a tie, vote by the senior cochair was cast. Applications, distributed in sets (four to six per set), were sent to team

members. Opinions based on a rubric were shared with partners. Each group met to present their partners' findings rather than their own. For the second review, all four members of the group presented strengths and weaknesses, and there was discussion. A group spokesperson would then speak for the whole group about their assessment. The committee then voted whether or not to retain the applicant in the search process. Retained candidates were invited for interviews, and each committee member was present at interviews. In order to provide equal and fair opportunity, the same person asked their question(s) for each candidate. The candidate interview was carried out using the same cooperative strategy, applied to three interactive performance components: a formal closed interview was conducted by the whole search committee; a presentation to an audience consisting of university faculty and staff on a subject chosen by the committee followed by a brief question and answer session; and an informal lunch interview with the committee and the Provost. Following this process, the committee met to review and appraise each of the candidates' strengths and weaknesses with regard to their performance.

DISCUSSION

The committee completed their decision process by submitting three candidates along with their strengths and weaknesses (unranked) to the chief academic officer. The final report was sent to the Provost for communication to the Board of Trustees with an acceptable recommendation. The use of a cooperative learning strategy used in the academic search process is unique, successful, and previously unreported.



Angina Visceral Mimicry Syndrome A Proposed Collaborative Integrative Treatment Model

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Visceral mimicry syndrome, first referenced in the mid-1990s, refers to the presence of somatic dysfunction creating pain patterns that appear to resemble (mimic) visceral-related dysfunction. The purpose of this paper is to propose a

parsimonious model treatment pathway for mimicry syndromes, related to angina-like pain patterns, that could potentially improve interdisciplinary collaboration between allopathic and chiropractic practitioners.

BACKGROUND

Literature describing visceral mimicry dysfunctions has primarily been limited to referred pain patterns that are commonly related to viscera, such as left shoulder pain arising from somatic versus cardiac etiology, right shoulder pain arising from somatic versus gallbladder etiology, and low back pain arising from somatic versus uterine/menstrual cycle etiology. Typical angina manifests as chest pain or discomfort and is believed to occur when heart muscle receives an inadequate supply of blood. Angina may present subjectively as a pressure-like or a squeezing pain in the chest. This pain may also occur in the shoulders, arms, neck, jaw, or back and occasionally resemble symptoms related to indigestion.

COLLABORATIVE MODEL

The issue of visceral mimicry syndrome represents opportunities for collaborative treatment options with chiropractors and allopathic physicians. Considering the reported prevalence of angina of somatic etiology, in the case of a patient presenting with myofascial indications of angina, in the presence of a negative history for cardiac red flags, normal vital signs, and other normal screening tests, it would be reasonable to have the chiropractor evaluate possible musculoskeletal involvement. A trial of chiropractic treatment could serve as a diagnostic test to help differentially diagnose this type of mimicry syndrome. Even while the patient is receiving the battery of cardiac tests, one method of assessment could be a brief chiropractic assessment and trial of therapy of 1 week. The patient would follow up with the cardiologist to assess any changes in pain or dysfunction. Very close collaboration between a cardiologist and a chiropractor, even possibly offering chiropractic treatment within

the cardiologist's office, would ensure the avoidance of unnecessary repeat testing as well as avoidance in delay of appropriate referral in both directions.

DISCUSSION

In chiropractic there are various methods that have attempted to incorporate viscerosomatic and somatovisceral interrelationships. Sacro-occipital technique is one such "technique system" which includes both reflex and direct somatic treatment components. The sacro-occipital technique system includes a model that addresses the relationships between myofascial dysfunction and mimicry visceral dysfunction syndromes called chiropractic manipulative reflex technique. Chiropractic manipulative reflex technique aims to diagnose visceral referred pain patterns and to suggest possible spinal manipulative and reflex treatments to aid a patient suffering from visceral mimicry or somatovisceral syndromes.

This paper has highlighted the potential gap in delivering more effective patient care for mimicry syndromes, specifically those that produce angina-like symptoms, and offer to a model of collaborative care based on both practical, conceptual, and patient-centered concepts. Bridging communication and collaboration between conventional and alternative practitioners will only serve to improve patient outcomes and perhaps reduce the need for repeat extensive diagnostic testing. Other opportunities to demonstrate further effects of chiropractic care on the organic component of cardiac disease might potentially grow from these interdisciplinary collaborations. In the presence of a fractious delivery system, that does not foster integration between conventional and alternative care providers, it is very likely that the majority of these types of mimicry syndromes, which could potentially respond to somatically directed care, will continue to be go unrecognized and untreated.



Assessing the Need for Dental–Chiropractic Temporomandibular Joint Comanagement

The Development of a Prediction Instrument

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The evolution of interdisciplinary care of the temporomandibular joint (TMJ) began in the late 20th century. It may be that for some proportion of patients who eventually develop a full-blown TMJ disorder (TMD), there is an adaptive stage during which the related musculature in the cervical spine and other posturally related muscles may be able to accommodate so as to mitigate TMJ restriction

or crepitus. The challenge for dentists planning to treat a patient with TMD is to determine whether or not a patient would prophylactically benefit from chiropractic cotreatment in order to prevent the onset of, or minimize the effect of, musculoskeletal symptoms secondary to dental TMD intervention. The purpose of this paper is to help begin the process of developing an assessment tool for dentists to assist them

in determining when a patient might not be able to adapt easily to related postural changes that may occur secondary to dental modifications of occlusion or TMJ balancing.

METHODS

In-depth interviews were conducted with groups of dentists specializing in the treatment of TMD, and the consistent request from the vast majority was the need for a tool to guide them in determining which patients would best benefit from chiropractic cotreatment. Based on the preliminary interviews and a review of existing valid and reliable measures, a preliminary assessment tool that measures five domains was developed. The domains are musculoskeletal manifestations, the patient's perception of pain, somaticization of psychological stress, physiological reserves to deal with stress, and the patient's self-reported quality of life. The preliminary assessment tool is composed of three instruments. The SF-12 is included, which is a general measure of health status. The general symptom survey for musculoskeletal dysfunction determines whether the patient has had a history or is currently suffering from headaches or neck, shoulder, hand, lower back, knee, or foot pain. Finally, the functional evaluation form tests proprioceptive abilities, static and dynamic postural balance tests, and cervical ranges of motion.

DISCUSSION

The interviewed dental professionals observed that posture can be a determinant of occlusion functionality outcomes

in some of their patients. They have identified a need for an assessment instrument that would help them to identify patients who may be at risk so that referral could be made before the initiation of occlusion modification. The goal of the assessment form, which includes functional analysis tests, is to help determine which "appropriate situations" or conditions are best for referral for chiropractic care. Although the selected assessment instruments were not originally developed or validated for their predictive capabilities, they are posited to measure health domains that may have some transferability to measuring predictive factors associated with the development of musculoskeletal reactions secondary to dental TMJ treatment. As new data become available, this instrument will be modified to reflect improved understanding of predictive elements. Concomitant with the development of a predictive assessment tool is the process goal of expanding interdisciplinary dialogue, which may help lead to standardization of TMJ dysfunction terminology and a "common language."

CONCLUSION

A starting point is needed and a reasonable attempt has been made to begin the daunting process of developing an instrument that would help inform dentists as to which patients may be likely to become symptomatic to peripheral musculoskeletal regions secondary to occlusion modification.



Patient Preference for Wellness Care: Is It on the Menu?

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Wellness care is a relatively popular topic in the emerging health care arena. Consumers are seeking better ways to prevent the onset of chronic diseases and even the common effects of aging by increasing their use of alternative approaches to getting and staying well, including preventing illness. Currently, patient preferences for wellness care are relatively low within the profession, ranging near the 10% level depending on the study. The World Federation of Chiropractic's "Consultation on Identity" found that only 6% of patients seek wellness care.

One question posed is, will patients seek out chiropractors more if they increase their level of orthodox preventive

health screenings and recommendations? Will a patient seek out a chiropractor for wellness any more than they would an allopathic health care provider? Clearly, in light of the inconclusive research evidence base on chiropractic alternative techniques, a balanced approach to wellness, inclusive of both normative public health promotion objectives as well as a reasonable approach to offering chiropractic alternative methods, should remain within the realm of discussion.

The study's specific goal was to find out what proportion of chiropractic patients seek wellness care when the practitioner incorporates an alternative model of accomplishing wellness

beyond moving joints. An attempt to determine whether a specific cohort of sacro-occipital technique (SOT) practitioners who utilize a broad palate of methods would have a similar or dissimilar proportion of patients operating under health beliefs that proactively sought care prior to focused complaint manifestation.

METHODS

A convenience sample of chiropractors, interested in participating in research, was asked to add a question regarding patient health preferences to their standard patient intake forms. This convenience sample was comprised of SOT practitioners from three geographic locations—United States, Australia, and Europe—who agreed to participate in this pilot study.

RESULTS

The most interesting finding is the variable of Health Behavior where 42.1% of patients presented to these chiropractor's offices without a specific focused complaint. These patients either presented for wellness care or prevention of illness or perceived they were at risk for injury.

DISCUSSION

Definitions of wellness argue for a more comprehensive paradigm for patient illness such as that described by the biopsychosocial model, which incorporates psychological and social components to health in addition to the biologic domain. When the patient has not been unduly coerced or pressured to accept prophylactic chiropractic care, but elects freely to utilize this type of care secondary to direct experience, then who is to say that this should not be allowed? How will patients even have this choice if one takes a hard line on an evidence-demand approach to this and all other alternative treatments available today, including medical treatments that have no efficacy data?

This pilot study evaluated patient health preferences as part of the normal patient self-reported history. An increased proportion of patients, relative to other studies, were identified as presenting for a category of wellness care. Although great care must be exercised in making generalizations from this set of data, clearly, increases in patients' preferences for wellness care could be related quite simply to whether the chiropractor is perceived by the patient to offer a mode of wellness care other than counseling for obesity or smoking cessation. Hopefully, greater study into the field of health behavior preferences and chiropractic will continue and greater insight will be garnered that will help chiropractors serve their patients' needs.



Interactive Educational Methods in the Development of Clinical Reasoning Skills

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Transitioning the student doctor from a didactic educational style to a situation where more integrative thought and problem-solving skills are required has been a goal throughout chiropractic education. Helping the student correlate lecture and laboratory materials within the curriculum, in a clinically relevant format, can facilitate the development of clinical reasoning and a greater understanding of individual patient presentations. Exposing the students to varied patient presentations, as well as the use of multiple resources and technologies, can foster the needed clinical reasoning and decision-making skills, as well as improve recall and knowledge management. In order to broaden the students' perspectives relative to instructional technology, a student-centered, inquiry-oriented activity called a Webquest was utilized. Webquests are designed to be time efficient for the student as well as allowing for students to focus on the given information and supporting their levels of synthesis, analysis, and evaluation. The instructor is able to integrate numerous

learning strategies into one assignment and therefore create a dynamic learning opportunity for students.

METHODS

Subjects were 123 students in a fourth-trimester upper extremities course at New York Chiropractic College. The assignment was a clinical upper extremity case study designed as a short-term Webquest activity. The Webquest assignment was placed on the college's intranet, allowing students to have greater access to the material. The topic was an upper extremity pain case presentation and the students were asked to work in groups of four, which they self-selected. Each group was asked to perform five tasks in relation to the topic: create a differential diagnosis list, rule in and rule out each diagnosis on the differential list, arrive at a

final diagnosis, give an example of the same diagnosis, and develop a treatment plan. The students were given a combination of resources which are available online and on reserve in the library.

RESULTS

Of the 123 students completing the assignment, 69 responded to the student perception survey. Student perception of the assignment was favorable, with 49/69 being introduced to new resources via the Web and textbooks on reserve in the library, 61/69 students having a greater understanding of a case presentation, and 38/69 felt they were more prepared for lecture.

DISCUSSION

Upon evaluation, it was found that the Webquest assignment enhanced the development on interactive, problem-solving

skills and assisted the students in correlating classroom materials into a clinical format. Additionally, a significant numbers of students were exposed to new resources, gained new access to educational materials, and facilitated discussion in relation to lecture material. The student-centered assignment also allowed for the students to determine what issues of this case presentation they would like to address and how they would like to do so in the form of small-group discussions and cooperative learning. This in turn encouraged the students to obtain a higher level of complex cognition. The current study has identified that the utilization of integrative educational technologies within a chiropractic curriculum can be an efficient and effective form of presenting case studies. Further, this process has great potential to facilitate the correlation of clinical concepts across and through a chiropractic curriculum.



Sagittal Plane Blockage of the Foot, Ankle, and Hallux and Foot Alignment Prevalence and Association With Low Back Pain

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Sagittal plane blockage (primarily decreased dorsiflexion) at the ankle and first metatarsophalangeal joints and flatfeet have been implicated as playing a role in chronic mechanical low back pain. The purpose of this study was to determine whether a link could be found between chronic mechanical low back pain, sagittal plane blockage of the feet and ankles, or flatfeet.

DESIGN

This study was reviewed and approved by the Institutional Review Board of the Durban Institute of Technology. The study was a blinded nonprobability correlation study involving 100 subjects with low back pain (group 1) and 104 subjects without chronic mechanical low back pain (group 2) between the ages of 18 and 45. Measurements included ankle and hallux dorsiflexion range of motion and difference in navicular height (navicular drop test) between

resting and neutral standing postures. All tests were carried out at the 5% level of significance. Parametric testing was used to analyze the data. Intergroup comparisons were made using the unpaired *t*-test and intragroup comparisons were made using the paired *t*-test. To test the association between mechanical low back pain and static foot measurements, a chi-square test was carried out. To determine the degree of association (correlation), the contingency coefficient was computed.

RESULTS

The unpaired *t*-test (intergroup) indicated a statistically significant decrease of ankle dorsiflexion in individuals with chronic mechanical low back pain (group 1) in comparison with individuals without low back pain (group 2) in both the right foot ($p = .002$) and left foot ($p = .032$). These intergroup findings, however, were not supported

by chi-square and Cramer's V tests (right foot $p = .085$ and left foot $p = .188$). Unpaired t -test (intergroup), chi-square, and Cramer's V tests showed no statistically significant difference between either group regarding hallux dorsiflexion. The unpaired t -test (intergroup) indicated a statistically significant difference regarding navicular drop between the two groups in the right foot ($p = .003$) and left foot ($p = .009$). Individuals with chronic mechanical low back pain (group 1) had a significantly smaller difference in navicular height (or a higher arch) between the resting and neutral standing postures in comparison with individuals without low back pain (group 2). These navicular drop findings were supported by chi-square and Cramer's V tests for the right foot ($p = .005$) but not the left foot ($p = .324$).

DISCUSSION

This study suggests that sagittal plane blockage (decreased dorsiflexion) may be a factor in chronic mechanical low back pain. The study also found a significant association between chronic mechanical low back pain and difference in navicular height between resting and neutral standing postures, suggesting that chronic mechanical low back pain subjects have normally aligned (not flat) feet. Further research is indicated.

This study was originally completed as part of a Master's degree in the Department of Chiropractic, Durban Institute of Technology (DIT), Durban, South Africa. The authors wish to thank DIT for its help and support.



Negative and Positive Side Effects of Chiropractic Care in a Teaching Clinic

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Chiropractic manipulation has many health benefits, with pain reduction as the most commonly cited. However, some individuals experience unexpected negative and/or positive side effects from chiropractic care. In a 1997 study on negative side effects of chiropractic manipulation, 44% of Swedish patients reported at least one minor negative reaction to treatment with local discomfort in the area of treatment as the most common (two thirds of reactions). Other studies demonstrated from 34% to 55% of subjects reporting at least one minor side effect after chiropractic care. Similar studies also demonstrated that 25% of chiropractic patients had at least one unexpected positive side effect from chiropractic care, with "easier to breathe" and "improved digestive function" as the most common statements. The purpose of this pilot study is to determine whether the percentage of subjects who indicate side effects (negative and unexpected positive) after a chiropractic treatment in a U.S. teaching clinic is similar to that in the previous Scandinavian studies. Logistical considerations from this study will be utilized for a similar, larger study in U.S. private practices.

METHODS

Consecutive new and returning chiropractic patients were invited to participate in a telephone survey. Willing subjects signed an Institutional Review Board-approved consent form, and 2 days after the chiropractic care, a research assistant contacted the patient by telephone to inquire about negative

and positive side effects. Questions used for screening were developed from previously published studies.

RESULTS

One hundred thirty-three consecutive patients at a chiropractic teaching clinic were approached to participate and 33 declined, leaving 100 subjects who agreed to participate in the telephone survey. Two subjects were subsequently unavailable. Of the 98 subjects remaining, the majority were female (54%), Caucasian (85%), married (57%), and considered a returning patient (90%). The primary reason for seeking care was back pain (49%), lower extremity pain (21%), neck pain (19%), and upper extremity pain (17%).

Of the 98 subjects, 11 (11%) experienced minor negative side effects after the chiropractic treatment, with nine subjects stating a presence of local discomfort and two stating discomfort radiating to another area. The median level of discomfort was 4 out of 10 (range, 1–8), started less than 6 hours after treatment, and lasted from 10 minutes to 2 days. The majority of subjects stated that the negative side effect did not affect normal daily activities at home or at work. There were no major side effects.

Thirteen of the 98 subjects (13%) demonstrated at least one unexpected positive side effect from the chiropractic treatment, with three demonstrating respiratory benefits, two demonstrating circulation benefits, and 10 demonstrating "other" benefits such as improved energy, attitude, and mental well-being.

DISCUSSION

The results found in this pilot study demonstrate a lower percentage of negative and positive side effects compared to previous studies. Methodological differences may have affected the results such as screening after only one visit rather than up to six visits as in previous studies. Differing

results may also be due to a patient response bias within this population. This pilot study is the first to define the incidence of side effects due to treatment by chiropractic interns compared with previous data on Scandinavian chiropractors. These data are useful for educational purposes and also for defining logistical problems for future studies on this topic.



The Effects of Upper Thoracic Spinal Manipulation on Autonomic Modulation of Cardiovascular Function in Asymptomatic Subjects During a Cold Pressor Test

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Dysfunction of somatic structures in the human spine may have a significant impact on neurological function, particularly the autonomic nervous system. No definitive research has clearly demonstrated a relationship between spinal manipulative therapy (SMT) and the modulation of cardiovascular autonomic function in the presence of acute nociceptive activity of somatic origin. The purpose of this investigation was to experimentally heighten cardiovascular sympathetic activity in asymptomatic subjects through the application of a cold pressor test and to determine how such activity is modulated by SMT applied either during or immediately preceding the cold pressor test.

METHODS

Prior to data collection, approval was obtained from the New York Chiropractic College Institutional Review Board. Subjects ($n = 22$) were seen in the autonomic laboratory on four separate occasions over a 2-week period. On each visit, after obtaining baseline data, a heightened cardiovascular-sympathetic response was evoked using the cold pressor test as the noxious stimulus. During the first visit, subjects performed a cold pressor test. During the second, third, and fourth visits, in a randomized order, subjects received a high-velocity, low-amplitude spinal manipulative thrust to their upper thoracic spine either during or immediately preceding

the cold pressor or repeated the cold pressor test without SMT. Power spectral analysis was performed on beat-to-beat R-R intervals (RRI_{HF}) and continuous systolic blood pressure (SBP_{LF}). Baroreceptor sensitivity was calculated. A Condition \times Time repeated measures analysis of variance was applied, and using paired t -tests, post-hoc analyses were done with three pairwise comparisons among the three conditions.

RESULTS

Post-hoc comparisons detected significant differences for RRI_{HF} , SBP_{LF} , and baroreceptor sensitivity between cold pressor and spinal manipulation prior to cold pressor conditions during the pressor test (26.8 ± 12.9 vs. 38 ± 14.5 ms^2/Hz ; 66.5 ± 16.1 vs. 55.4 ± 18.1 $mmHg^2/Hz$; and 1.14 ± 0.78 vs. 1.02 ± 0.77 $mmHg$, respectively; $p < .01$).

DISCUSSION

The data suggest that SMT applied prior to a somato-autonomic provocation significantly reduced the sympathetic vasomotor response and attenuated cardiac vagal withdrawal.



Prevalence of Herniated Intervertebral Discs of the Cervical Spine in Asymptomatic Subjects Using MRI Scans

A Qualitative Systematic Review

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Forensic experts commonly cite studies that have determined the prevalence of intervertebral disc derangements—and in particular, disc herniations—of the cervical spine in asymptomatic subjects. The purpose of this study was to review articles that report the prevalence of cervical disc herniations in asymptomatic subjects using MRIs and to conduct a qualitative systematic review.

METHODS

A MEDLINE search for English language articles published between 1974 and 2004 was performed using the MeSH terms *intervertebral disk*, *intervertebral disk displacement*, *MRI scans*, and *disk, herniated*, as well as the non-MeSH terms *cervical disc*, *prevalence*, and *asymptomatic*. The related articles/link feature of MEDLINE was used to identify articles similar to those retrieved from the initial search. Correspondence was initiated with the primary author of a seminal paper in this field to identify articles that may have been overlooked. A total of six articles were retrieved. Loose inclusion criteria were applied to the articles because of the few retrieved. Articles not consistent with the purpose of this study were excluded. One study was excluded because it used CT and not MRI; therefore, five articles were retained in this review.

RESULTS

A study of 100 asymptomatic subjects (35 assessed retrospectively and 65 assessed prospectively) found that 20% of subjects aged 45–54 years, 35% of subjects aged 55–64 years, and 57% of subjects older than 64 years had cervical disc herniations/bulges. A second study involving 63 asymptomatic subjects found 10% of subjects less than 40 years of age and 5% of subjects older than 40 years had disc herniations. A third study of 89 asymptomatic subjects found that each of two subjects (one 29 and the other 56 years) had a disc prolapse; the prevalence was 2.2%. A fourth study of 497 asymptomatic subjects found that 70 of 2,480 discs scanned were prolapsed posteriorly (2.8%) and reported that the frequency of these lesions increased after age 40. A fifth study compared 15 asymptomatic and 16 symptomatic subjects after 7 years and found no disc herniations (0%) in the asymptomatic group and four disc herniations (25%) in the symptomatic group. In summary, the prevalence of cervical disc herniations in asymptomatic subjects less than 40 years of age is 3–10% and increases to 20% in subjects up to 54 years of age. The prevalence increases with age—from 5% to 35% in subjects between 40 and 64 years of age.



Back Pain in an Ontario Long-Term Care Facility

A Pilot Study

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Back pain is one of the leading causes of chronic health problems in the population over 65 years of age. Although the prevalence of back pain in the elderly is not accurately known, some studies suggest that older adults have an even higher prevalence of nonspecific musculoskeletal pain (65–80%) with 36–40% reportedly suffering from a back pain condition. The problem of back pain in residents of long-term care facilities is essentially unknown. Recently, the Ontario

Ministry of Health and Long-Term Care de-listed chiropractic services from the Ontario Health Insurance Plan at a critical time in the development of chiropractic care for the chronic geriatric residential care population in Ontario. The impact of this policy decision has yet to be determined. The purpose of this study was to determine the prevalence, characteristics, and predictors of back pain among geriatric residents in a long-term care facility.

METHODS

A retrospective, randomized chart review was conducted on a representative sample of residents' clinical charts from a long-term care facility in Toronto, Canada. Data concerning age, gender, report of pain, pain location, analgesic use, depression, cognitive status, ambulatory status, and comorbidities were abstracted on a standardized form. Variables were chosen based on the literature and their suggested correlation with back pain.

RESULTS

One hundred forty charts were randomly selected and reviewed. Sixty-nine percent of the selected residents were female, and the average age was 83.7 years (range, 51–101). Residents in this long-term care facility had a pain prevalence of 64% (89/140), with a 40% (55/140) prevalence of musculoskeletal pain. Of those with a charted report of pain, 6% (5/89) had head pain, 2% (2/89) neck pain, 21% (19/89) back pain, 33% (29/89) extremity pain, and 38% (34/89) had a nondescript pain complaint. A logistic regression analysis

revealed that osteoporosis was the only predictor for back pain from the variables chosen ($p = .001$). Descriptive statistics were used to summarize the patients' characteristics or variables between study groups.

DISCUSSION

Residents with back pain represent 8% (19/140) of the resident population studied, making back pain as prevalent as other common conditions in the long-term care population such as diabetes and congestive heart failure. Among all the variables tested, osteoporosis appears to be the only statistically significant predictor for those with reported back pain. The back pain resident in this facility can be typically described as female, osteoporotic, with mild to moderate dementia, independent or assisted walkers, and with a low rate of depression. Although there are problems in retrieving accurate information from chart reviews, underreporting of pain in general and back pain specifically is likely in this population. Further research including multiple sites is needed to determine the overall prevalence of this condition and its impact on quality of life issues. The results of this study should inform future research in this area.



A Descriptive Literature Review on Neck Pain and Cervical Artery Dissection

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The purpose of this study was to assess the correlation between neck pain in patients who present to a chiropractic office and the relevant risk factor for cervical artery dissections.

METHODS

A literature search of the Pubmed, MANTIS, CINAHL, and Alt.Health Watch Databases was performed. Indexing terms used were *neck pain*, *cervical artery dissection*, *vertebral artery dissection*, and *chiropractic manipulation*. The results of this database search produced 50 articles. References of the selected studies were also searched for relevant papers. Selection of relevant articles for final review was based on whether the article's primary focus was on symptoms of cervical artery dissection and whether neck pain and chiropractic manipulation were evaluated and discussed extensively.

RESULTS

Fourteen articles were selected. This literature reviewed suggested that within the patient population that presents to the chiropractic office, new, sudden, intense neck pain before or after a chiropractic manipulation may be manifesting an initial symptom of a cervical artery dissection.

DISCUSSION

The results of this review demonstrate that prudence in patient selection, intervention, and processing may prove fruitful in both identifying patients with vascular pain from arterial damage and preventing possible ischemic complications.



Examination of Joint Hypermobility as a Premanipulative Test A Descriptive Literature Review

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The purpose of this study was to examine the literature regarding hypermobility, a range of movement of a joint that exceeds the norm, as a possible risk factor for cervical artery dissection.

METHODS

A literature search of the Pubmed was performed. Indexing terms used included *cervical artery dissection*, *vertebral artery dissection*, *chiropractic manipulation*, *joint hypermobility*, *connective tissue disorders*, *benign joint hypermobility syndrome*, and *neurologic complication*. Subcategories of disease states and references of the selected studies were also searched for relevant papers. This database search produced 1,150 articles. Thirty-seven articles were selected based on whether the article's primary focus was on the pathophysiology of cervical artery dissection as it related to disorders of connective tissue and/or whether chiropractic manipulation was evaluated and discussed extensively. All types of studies were eligible, including case reports.

RESULTS

In this literature review, hypermobility was suggested as a possible risk factor for cervical artery dissection. Furthermore, large numbers of patients with connective tissue disorders experience cervical artery dissections.

DISCUSSION

This descriptive review addresses a possible correlation between a unique patient population (hypermobility syndromes) that present for manipulation and cervical artery dissections. Systematic examination of joint hypermobility with a series of nine maneuvers (Beighton score) may identify patients at risk for cervical artery dissection.



Chiropractic Care and Management of an Adult Hydrocephalic Patient With Ventriculoatrial and Ventriculoperitoneal Shunts A Case Report

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Hydrocephalus is excessive accumulation of cerebral spinal fluid (CSF) in the brain. It may result from genetic inheritance (aqueduct stenosis) or developmental disorders such as those associated with neural tube defects, including spina bifida and encephalocele. Complications from premature birth such as intraventricular hemorrhage, disease such as meningitis, tumors, traumatic head injury, or subarachnoid hemorrhage blocking exit from the ventricles to the cisterns may also cause hydrocephalus. Using a shunt apparatus for hydrocephalus is the neurosurgical procedure most frequently used to divert the flow of CSF from a site within the central nervous system to another area of the body where it can be absorbed. In this case, the shunt types used are ventriculoatrial and ventriculoperitoneal. The purpose of this case report is to discuss the successful chiropractic care and

management of an adult patient with congenital hydrocephalus.

CLINICAL FEATURES

A 23-year-old male presented with low back and bilateral knee pain of 10 months' duration. He informed the student extern and faculty clinician at Palmer College's Community Outreach Clinic that he had shunts in his head and neck due to congenital hydrocephalus. A full health history and complete physical exam, including the knee, was performed. Full spine and chest radiographs were taken. There were no significant abnormalities noted on physical

examination, orthopedic and neurologic examination, or chiropractic spinal analysis. Radiographs showed CSF shunts along the cervical spine going into the chest and peritoneal cavities.

INTERVENTION AND OUTCOME

A working diagnosis of low back pain due to lumbar and pelvic subluxations was made. Cervical and thoracic subluxations were also noted. Over a period of 8 weeks, the patient was treated with low-force adjusting techniques using Thompson drop technique in the thoracic, lumbopelvic, and right tibia areas and Activator method and/or Thompson drop technique in the cervical area. Primary areas that were adjusted were right ilium, T5, C2, and right tibia. The schedule of care was two times per week for 2 weeks, followed by one time per week for 6 weeks, then

re-evaluation of the patient's progress. The patient had missed several appointments but has been responding well to this adjusting approach and schedule of care.

DISCUSSION

Avoidance of occluding and damaging the catheters located within the scalenes and sternocleidomastoid muscles was of the utmost importance. Techniques to be avoided for cervical spine, in this case, would be any rotational type of adjusting, such as supine diversified (formerly known as modified rotary break) or Gonstead cervical chair. No manual pressure should be placed on the catheter because of the possibility of occluding and damaging the catheter or flow valve shunt causing mechanical failure. For the thoracic, lumbar, and pelvic adjustments, any reasonable adjusting technique could be used.



Chiropractic Education in a Federally Funded Geriatric Education Center

Paul Dougherty, D.C., New York Chiropractic College

It is estimated that 11–15% of older adults in the United States utilize chiropractic services, mostly for musculoskeletal complaints. The number of older adults seeking chiropractic care is expected to rise as the baby boomers age. It is therefore imperative that the chiropractors of the future be trained in the special needs of the older adult. It is also imperative that the chiropractor of the future be trained to function in an integrated environment. Gerontologic competencies of practicing chiropractors and chiropractic educators can be enhanced through an integrated training model. In continuing with the tradition of excellence of the Geriatric Education Centers (GEC), chiropractic is now part of this federally funded multidisciplinary training program to meet the needs of the older adults.

RATIONALE

Integration of allopathic medicine and chiropractic across group practices and organized delivery systems in general holds promise for creating a quality-focused and efficient health care system. This system will be better equipped to deliver accessible, comprehensive, and coordinated care. There is a need to train the future chiropractic physicians in the special needs of the older adult. In the Iowa 65+ study, utilization of chiropractic services in older adults with back pain reached 70% in certain regions. Chiropractic also is integrating into the mainstream of health care in

many locations. A university-based long-term care hospital became the site of the first integrative chiropractic clinic in a long-term care facility in January 2002. It was started as a part-time experimental clinic and is now a full-time clinic and is actively involved in teaching chiropractic students and medical interns and residents. The chiropractic project involves the creation of a geriatric elective course and also integration of geriatric education throughout the chiropractic program. Prior to this there were no specific geriatric educational programs aimed at training chiropractors in traditional medical centers or training chiropractors to function in an integrated environment.

METHODS

Chiropractic education in the GEC currently involves practical “hands on” training as well as participation in didactic programs. The practical training includes participation in evaluation and treatment of the frail elderly in a long-term care hospital as well as ambulatory community-dwelling older adults. The students also participate in practical rotations through a multidisciplinary geriatric assessment clinic, involving diverse professions, including medicine, neuropsychology, social work, and nursing. The students also participate in rotations in hospital-based physical therapy, occupational therapy, and speech therapy, as well as an outpatient exercise center. These rotations allow the students to gain

important skills in the evaluation and treatment of older adults. The didactic programs in which the students participate include a geriatrics journal club, geriatric medical grand rounds, and a core curriculum of geriatrics lectures.

FUTURE PROGRAMS

The future programs for the GEC will involve the creation of a standardized geriatric curriculum that will be developed at the sponsoring institution and then will be disseminated to other chiropractic colleges through a GEC-sponsored seminar. The development process will utilize modified Delphi technique to identify and prioritize the major themes for the education of chiropractors in regards to the special

concerns of older adults. The curriculum will then be tested and reassessed at the end of 1 year. The ultimate goal will be the creation of a standardized geriatric curriculum.

CONCLUSION

Chiropractic education has been successfully integrated into a university-affiliated long-term care facility. This integrated clinic and its sponsoring chiropractic educational institution have now successfully achieved funding not only to train current chiropractic students in an integrated setting, but also to create a standardized curriculum for utilization at other chiropractic institutions.



Safety of Spinal Manipulation in Frail Older Adults A Case Series

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Spinal manipulation has been shown to be relatively safe in the general population. The most valid studies suggest that about half of all patients will experience adverse events after spinal manipulation therapy. These events are usually mild and transient. No reliable data exist about the incidence of serious adverse events. Even though spinal manipulative therapy is a commonly used treatment for older adult patients with chronic spinal pain, issues of safety must be taken into consideration given the reduced strength, endurance, and tissue capacity associated with aging and disease. Although cadaveric data suggest that thoracic spinal manipulation/mobilization may be safe, there are no data to date on the in vivo safety of spinal manipulation in the older adult, particularly the frail older adult. The purpose of this study was to assess the safety of spinal manipulation in a frail older adult population in a university-affiliated long-term care facility. The subjects participated in a pilot clinical trial designed to assess the efficacy of manual therapies for chronic obstructive pulmonary disease.

METHODS

Eight patients consented to participate in the research study, which was evaluating the role of manual therapies in chronic obstructive pulmonary disease. The patients received a 4-week course of thoracic spinal manipulative therapy, a total of 12 manipulative sessions per patient. This spinal manipulative therapy consisted of high-velocity, low-amplitude manipulation of the thoracic spine, as well as

rib mobilization and mechanically assisted manipulation. At each treatment visit, the patients were asked to describe any adverse events from the previous treatment session and to grade the severity of the adverse event on an 11-point pain scale (0 = no pain and 10 = worst pain imaginable). Institutional Review Boards of New York Chiropractic College and the university-affiliated hospital approved the project. Each patient signed an informed consent form.

RESULTS

The patients ranged in age from 68 to 89 years old. The patients included seven females and one male. One patient did not report any adverse events during the course of the 4-week intervention. Of the remaining seven patients, the number of adverse events ranged from two to eight per patient. The average visual analog scale score per patient ranged from 2.0 to 5.9. All adverse events were mild transient events, with none lasting longer than 24 hours. It must be emphasized that none of patients reported any serious adverse events, including fracture or significant bruising.

CONCLUSION

This small case series suggests that high-velocity, low-amplitude spinal manipulation, rib mobilization, and mechanically assisted manipulation may be safe procedures in

the frail older adult with chronic obstructive pulmonary disease. There is a need for future studies involving greater numbers of patients to make more definitive statements

about the safety of high-velocity, low-amplitude manipulation in older adults in general and in frail adults specifically.



Coupled Range of Motion Measurement Before and After Chiropractic Care A Case Study

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The purpose of this paper is to discuss the effect of chiropractic care on a patient’s cervical coupled range of motion after receiving chiropractic care, measured by using the Ascension Technologies Flock of Birds magnetic motion tracking unit.

using the Flock of Birds motion tracking unit. During three office visits, all three cardinal motions improved, there was a smoothing of the coupled motion curves, and shoulder symptoms subsided.

CLINICAL FEATURES

A 37-year-old male patient presented with complaints of neck and left leg stiffness. His history included compression fractures at T8 and T9, which were caused by a motor vehicle collision 20 years prior to his visit. Additional symptoms included right shoulder pain on cervical left lateral flexion.

DISCUSSION

The above findings indicate that changes in cervical range of motion have occurred following chiropractic adjustments, with a trend toward improvement, and show that these changes may be more complex than a simple increase in a range presumed to have been restricted. Because this is a single patient case, and was actually a pilot for a larger study, no hard conclusions can be reached. However, this study is a small step toward further understanding of changes in range of motion before and after chiropractic adjustment.

INTERVENTION AND OUTCOME

Management consisted of full-spine chiropractic adjustments. Three-dimensional ranges of motion were analyzed



Thinking Outside the Box Using Team-Based Learning to Educate the Board of Trustees

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Educational institutions face the challenge of ensuring that every member of their Board of Trustees is educated to understand and appreciate the obligations, rights, responsibilities, uniqueness, and division of authority within the organization. This challenge must be met in order for each Board member to satisfy his or her obligation and thereby provide the best

resources necessary for the organization. This challenge is especially difficult when these responsibilities encompass such varied issues as financial oversight, adherence to the vision and mission of the organization, being a court of last resort for the student body, and the hiring and review of the chief operating officer of the organization. The Canadian

Memorial Chiropractic College (CMCC) has recently started to make use of Team-Based Learning (TBL) in its undergraduate program. The initial experiences with TBL have been positive and have led to a number of faculty members implementing TBL sessions in their courses. This led to a decision to utilize TBL in a recent education session for the Board of Trustees. This presentation describes a TBL session used for the dual purpose of introducing the members of the Board to this small-group learning method and assisting them toward a better understanding of their obligations, rights, and responsibilities as Board members.

METHODS

The TBL session involved 19 individuals, comprised of 15 Board members, the CMCC President, the Board assistant, legal counsel to the Board, and a facilitator. The Board members were given topical material for prereading and were also required to review other relevant published material. In offering the session, the authors attempted to follow all the core principles and elements of TBL. Each group of four to five individuals were carefully selected to make them as diverse as possible and to distribute possible member assets and liabilities as evenly as possible, such as experience on the Board, nonchiropractors, and members of the executive. The session started with an individual readiness assessment test (IRAT), after which the members went into their groups

for the group readiness assessment test (GRAT) and the application exercise.

DISCUSSION

Interesting changes in group interaction occurred as the session progressed. The fact that the 28 IRAT/ GRAT questions were completed in batches of five to eight allowed for frequent intragroup as well as intergroup interaction. Judging by the increase in sound levels in the room, member engagement increased. Competition between the groups also increased and a number of members indicated afterwards that they started thinking more deeply about the important concepts behind the questions. Although many of the questions might have appeared simple or trite, they generated serious discussion within as well as between groups. Through the discussion, members began to understand the rationale for certain actions taken by the Board. The fact that some of them had already been in similar situations also helped them understand their unique role in the institution as well as understand the importance and potential consequences of their actions as Board members. The TBL for the Board of Trustees of CMCC appeared to have been an unconditional success, and one member indicated that he had learned more about the intricacies of the organization and had more discussion with his fellow Board members in the TBL than he had had in the previous 2 years of participating on the Board.



Developing a Series of Objectively Structured Clinical Examinations for a Clinical Methods Course

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In the spring of 2000, Palmer College Clinics instituted an informal assessment for the seventh-trimester students. This test was designed to allow the faculty to get an idea of the level of learning and the clinical skills acquired by the students before entering the outpatient clinics. Early in 2005, the standards from the Council on Chiropractic Education (CCE) changed, and it was decided to institute a series of formative objectively structured clinical examinations (OSCEs) with a summative OSCE into the seventh-trimester Clinical Methods class. In addition to the changes in the CCE standards, it was felt by the clinic administration and the examiners that the seventh-trimester clinic assessment was too unstructured and lacked consistency between examiners. The purpose of this study was to provide timely feedback to the students on their clinical performance and to assess the cohesiveness between the academic and the clinical settings.

METHODS

In order to develop the formative OSCE, the practical components (e.g., history taking) had to be determined. The class size, the amount of time needed to perform each aspect of the examination, the timing format for the three stations, the number of testing sites, and the number of examiners needed had to be established. A survey was developed and administered after the completion of the formative OSCEs concerning the students' feelings of preparedness for the OSCEs prior to and subsequent to the formative OSCE. The summative OSCE consists of three stations concerning one case. The history is elicited, an examination is performed, and the student has to complete a management station consisting of diagnosis, management, and follow-up.

RESULTS

The largest expenditure in creating the formative and summative OSCEs was manpower time. Ten individuals developed cases for the formative OSCE exams. All faculty from the student clinic and as many as five faculty from the outpatient clinics acted as examiners for a total of 32 testing hours (including the summative OSCE) during the spring trimester of 2005. In addition, seven staff persons participated in assisting with the OSCE testing (moving the students from station to station, timing each station, setting up the testing sites, and returning the clinic to normal operations after the conclusion of each formative OSCE). The summative examination used 20 examiners, 12 staff members, and a coordinator for the examination. Prior to the formative OSCEs, with the exception of the X-ray OSCE, 81% of the students felt extremely prepared or prepared for the formative OSCE, while only 49% of the students felt extremely prepared or prepared for the X-ray OSCE. Subsequent to the formative OSCEs, excluding the X-ray OSCE, a mean of 75% of the students felt that they had been extremely prepared or prepared for the OSCE. However, only

57% of the students felt that they had been prepared for the X-ray OSCE.

DISCUSSION

This study is limited in that reliability is enhanced by increasing the number of stations; each formative and summative OSCE had only three stations. There are advantages and disadvantages to an OSCE assessment. The advantages are that the OSCE is more reliable and more valid and that a large number of students can be tested. The disadvantages are that the students are tested in compartments, the OSCE is demanding for both examiners and patients, and the time invested in setting up an OSCE is greater than for a traditional examination. Although, in conclusion, there were only three stations in the summative OSCE, the students performed tasks (history, examination, and management) on the same patient case. The Clinical Methods class syllabus was changed to reflect the OSCE scores, both formative and summative, so that they would comprise 80% of the final grade.



Evolution of an Information Literacy Course for Chiropractic Students Lessons Learned in the Trenches

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Because of the importance of being “information literate” in an information-rich society, more academic institutions acknowledge that one-shot bibliographic instruction is not enough to allow the sophisticated searcher to meet today’s information society demands, especially in health sciences. More academic institutions are offering for-credit information literacy courses, most meshed with other course content. Palmer College of Chiropractic is no different. However, after searching the literature, the authors found that there was no model from other chiropractic or medical colleges for an information literacy class designed for health sciences—no directions on what topics were essential to cover, what students could reasonably be expected to know from their undergraduate experience, or what would or would not work in a classroom situation. Therefore, the class that was developed and initially presented has undergone many alterations over the 3 years. The goal of this paper is to show how and why the information literacy class at Palmer College Davenport evolved from its initial presentation to the current model and to provide possible directions for the future.

METHODS

Initially, the course was required during students’ second trimester. Each class contained approximately 250 students per term in two sections. Still required, the class has been transitioned to the first trimester, meeting twice a week for the first half of the trimester instead of once a week for the whole trimester as originally scheduled. The optimal situation would be small classes in wired classrooms where each student would have access to a computer. Due to student scheduling and classroom and instructor availability, it began with approximately 125 students in each of two sections in a lecture hall with Internet hook-up for the instructor. The presentation style, therefore, was lecture or demonstration, with an outside assignment for students to assess their understanding of material presented in class. This format has not changed. The rule-of-thumb of 1 hour of outside work per credit hour was used when designing the course assignments. There was also a midterm and final examination.

RESULTS

During and after the first term in which the class was presented, areas of instruction needing revision were identified through student feedback on attendance forms, the course survey at term's end, and instructor observation. Student surveys indicated that students felt that the expectations were too rigid and some of the material presented was repeating basic information they already knew. Students wanted more emphasis on chiropractic resources. From the instructor standpoint, the course had included more material than could be effectively presented in a 50-minute period and assignments took several hours to score as originally designed. This led to multiple revisions on many lesson plans, objectives, corresponding course content, and assignments. It also included building lab time into some class sessions and

changing the text to a collection of readings and lecture notes. Written assignments have been streamlined even further.

DISCUSSION

Students responded favorably to the more relaxed format and attempts to relate the class to their other courses, as well as stressing advanced searching techniques in the databases. Many commented that the "text" would be a useful reference tool in the future. Teaching a for-credit information literacy class to chiropractic students involved a great deal of developmental work. However, considering the continually changing technology and demographic makeup of the student body, the challenge is to continue to make the course relevant and meaningful to students.



The Feedforward Mechanism as It Is Related to the Prone Leg Check A Review

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Leg-length inequality is divided into two categories: actual anatomic asymmetry as a result of injury, disease, or developmental error; and physiologic or functional, which may be the result of suprapelvic and pelvic muscles causing pelvic torsion in an unloaded condition. Leg-length analysis performed by chiropractors has a long history and is widely used in clinical practice. Based on a review of the literature, it is the authors' intent to define the underlying cause of this suprapelvic hypertonicity and resultant leg-length inequality and to utilize the concept of the "feedforward" mechanism to further substantiate the clinical application of the prone leg check in chiropractic assessment.

SUPRAPELVIC MUSCLE HYPERACTIVITY

Normal movement dynamics in the affected spinal joints may be altered because of microtrauma or macrotrauma affecting the lumbar spine or lumbar postures as stabilization muscles fatigue to the point where the proprioceptors cease to function fully and correctly. Research indicates that excessive and uncontrolled movement is much more of a problem than restricted movement. It is the lack of support, protection, and control provided by the spinal stabilization muscles that allows these tissues to be placed in the condition that causes pain. As the nervous system experiences difficulty activating the stabilization muscles, it will increase the activity of the large global muscles of the back and trunk in an attempt to provide the stabilization. This accounts for the hypertonicity, and even spasm, often seen in the large back muscles during

an acute back pain episode. This "suprapelvic muscular hyperactivity" becomes chronic in that it is constantly being stimulated to compensate for the malfunctioning of small spinal stabilization muscles. Thus, when the patient is laid prone and the downward pull of gravity is eliminated, the pull of suprapelvic muscles on the pelvis is more effective at producing the unlevel pelvis that creates the short leg, as well as the other physical signs of the short leg.

FEEDFORWARD MECHANISM

Upon flexing of the patient's knees, the proprioceptive input from the lower extremity, pelvic, and spinal joints that initiates the feedforward mechanism of spinal stabilization is activated. However, the feedforward mechanism is not effective in producing the stability and support needed in the spinal joints in the presence of dysfunction in both the neurological input and physical contraction of the stabilization muscles. This instability leads to activation of the global back muscles in an attempt to stiffen the spine and provide stability. This suprapelvic muscular hyperactivity prevents the ilia from moving normally when the rectus muscles of each anterior thigh are stretched via bilateral knee flexion. A normal functioning feedforward mechanism, along with adequate strength in the muscles activated by this system, would have limited excessive or uncontrolled vertebral movement with no activation of the global spinal muscles would have occurred. The spine would not have been "stiffened" by the activity of the global muscles in their attempt to limit

the excess or incorrect movement and each ilium would have moved freely. Correction of the articular dysfunction will be reflected by improvement in the leg checks by improving the neurological function of the feedforward mechanism and its effect of increasing spinal stability.

DISCUSSION

Even though Lawrence states, "there is no proof within the literature that (a functional short leg) exists," the authors

agree that most likely, the functional short leg is the product of suprapelvic muscular imbalance brought on by the body's attempt to stabilize an unstable spinal or pelvic segment. It is the intent of the authors to spawn discussion and further clinical research of the feedforward mechanism and its relationship to leg-length inequality, articular dysfunction, and chiropractic practice.



Acute Neck Pain and Practice-Based Research Initial Results

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There are very few studies to date dealing with cervical spinal manipulative therapy (SMT) for the treatment of acute neck pain. One of the primary reasons is that the duration of acute neck pain is short, forestalling attempts to carry out randomized clinical trials. Accordingly, a practice-based research model is an excellent approach to investigating this topic, because practicing chiropractors are able to recruit acute neck pain patients very early in the course of the condition and then begin treatment without delay related to a research protocol. The primary objective of this observational study is to assess the ability of the Palmer College of Chiropractic West practice-based research network to reliably gather data concerning acute neck pain patients. Secondly, the study may generate interpretable pilot data.

METHODS

This study was reviewed and approved by the Institutional Review Board of the Palmer Center for Chiropractic Research. Ten local chiropractors in private practice were recruited to provide data on their management of patients with acute neck pain. They were to prospectively collect and report data on several specific outcome measures pertaining to their treatment of qualified patients. Chiropractors were recruited using several methods including a newsletter article, presentations at local chiropractic society meetings, referral from colleagues already in the study, and by personal contact from the investigators.

RESULTS

The recruiting methods resulted in 38 chiropractors signing their names to an interest list. These doctors were mailed

additional information about the study and a participation agreement that outlined the participating doctors' involvement with the school. Unfortunately, most of the doctors did not return their signed participation agreements. Consequently, they were each contacted by telephone to determine their level of commitment and to encourage their enrollment. Ultimately, 22 agreements were returned and these were the doctors included in the study. The 22 participating doctors were provided printed certificates of participation and invited to an evening training session to provide them with an orientation on the study protocol and the questionnaires that would be used. Twelve doctors attended the session and the remainder were trained by telephone. Two of the participating chiropractors withdrew from the program prior to data collection, leaving 20 who were sent study questionnaires to use on their new acute neck pain patients. Without further prompting, six participants provided data on 22 patients. However, 14 did not provide any data and were contacted by e-mail and then by telephone to ask why not. These doctors gave various reasons for not collecting data, but most simply forgot to implement the program into their practice routine. All 14 have recommitted, and the authors anticipate reaching the initial objective of 10 active participants.

DISCUSSION

This study presents the recruitment process and early data collection performance of chiropractic doctors involved in a practice-based research study. The frequent contact with the doctors, training in procedures, and the tools that were provided have been useful in reaching the objectives. Recruiting chiropractors into the study has been challenging, and good implementation and follow-through have been difficult, which is one of the reasons that the participating

doctors have been regularly contacted with instruction and encouragement.

CONCLUSION

The development of a practice-based research network has been somewhat problematic, which has resulted in the

implementation of several remedial strategies. Moreover, this study does at least confirm the notion that a large commitment of time and energy is necessary to carry out a successful practice-based research project.



The Effect of Sensor Placement on Dynamic Paraspinal Surface Electromyography Activity in the Assessment of Cervical Passive End-Range Capability

Michael T. Haneline, D.C., M.P.H., **D. Dale Nansel**, Ph.D., **Aaron Wiegand**, B.S., and **Jeff Hurewitz**, B.S., Palmer College of Chiropractic West

Goniometric cervical passive end-range (CPEP) was previously shown to be a reliable method to detect motion asymmetries at the extremes of lateral flexion and rotation. However, assessment of additional parameters potentially associated with restrictions of CPEP capacity has not been carried out. Surface electromyography (sEMG) can provide information about the patterns of activation or tension developed in muscles and dynamic sEMG can assess patterns of change that occur over time. The objective of this study is to investigate optimal sEMG sensor placement for use during CPEP evaluation of cervical lateral flexion.

METHODS

This study was reviewed and approved by the Institutional Review Board of the Palmer Center for Chiropractic Research. Bilateral dynamic sEMG readings were performed on the cervical paraspinal regions, first in the midcervical region with bipolar sensors affixed at the levels of C6 and T1, then in the cervicothoracic region, with sensors at the T1 and T3 levels. Placement was bilateral over the posterolateral aspect of the cervical and upper thoracic spine straddling the spinous processes, with a 2-cm distance between sensors. A reference electrode was placed over the electrically inactive tissue at the T8 spinous process to minimize the potential for a disturbance signal. The skin was cleaned with alcohol and shaved when necessary at the sites of electrode contact prior to placement. Silver-silver chloride self-adhesive surface electrodes were utilized which contain an embedded electroconductive gel to ensure optimal contact. The interelectrode distance for placement of bipolar electrodes in this study was set at 2 cm, since the study was targeting relatively small muscles and since it has been reported that interelectrode distance should not exceed one-quarter of the

muscle length to obtain an optimal signal. Cervical range of motion was evaluated using the Cervical Range-of-Motion (CROM) Measurement System to enhance precise replication of lateral flexion movements from pass to pass. Seated subjects were passively placed in end-range lateral cervical flexion by an examiner who was blinded to any concomitant data collection. The goniometric evaluator used his/her fingers and palms to clasp the sides of the subject's head while in a neutral position. In order to avoid anterior flexion and/or rotational head displacements that might influence lateral-flexion measures, the examiners positioned their feet forward or backward so that their elbows rested comfortably and symmetrically at their sides. The examiners paused at maximum end range for a moment until signaled by the recorder that the left or right end-range measure had been read and recorded. Five left and five right alternating measures of lateral-flexion were obtained from each subject.

RESULTS

Preliminary data point to an advantage for use of the lower electrode placement. The typical sEMG pattern that was observed in this study revealed that there was increased electrical activity on the ipsilateral side of movement that switched corresponding with each pass to the right or left. Upper electrode placement did not depict this shift as accurately as did the lower placement.

DISCUSSION

Preliminary evidence suggests that the lower placement at T1 and T3 of sEMG electrodes is preferred to the midcervical

placement. However, this premise must be established by means of a larger study. The authors were interested in studying EMG activity in the deeper multifidus and rotatores

muscles, although background noise associated with cross-talk from the semispinalis capitis, splenius capitis, and/or trapezius muscles was most likely present.



The Effect of Sacro-occipital Technique Category II Blocking on Spinal Ranges of Motion A Prospective Case Series

Jerry I. Hochman, D.C., Life University

Although some research has shown a relationship between spinal manipulation and changes in spinal ranges of motion, in almost all cases these manipulations were performed in the same regions as those measured. There is little evidence that manipulation in one area can affect spinal range of motion in any other region. In a search of the literature, no evidence was found relating pelvic manipulation to changes in spinal range of motion. The purpose of this paper is to describe changes in lumbar and cervical range-of-motion measurements after supine pelvic blocking as used in sacro-occipital technique (SOT). Supine blocking, referred to as category II blocking, is commonly used to enhance sacroiliac stabilization and reduce pelvic distortions.

METHODS

This study was reviewed and approved by the Institutional Review Board at Life University. Five subjects were recruited and selected for SOT of sacroiliac distortion and instability. Cervical and lumbar ranges of motion were measured both before and after category II blocking by a blinded assessor using a Zebris (Zebris GmbH Tuebingen, Germany) ultrasonic motion detector.

RESULTS

Significant changes were found in the lumbar spine only. Increased ranges of lumbar motion occurred in all planes except extension (21–57%).

DISCUSSION

Supine pelvic blocking as used in sacro-occipital technique had an effect on lumbar ranges of motion in these five cases. This may indicate that functional change in the pelvis results in changes in lumbar motion, especially lumbar flexion. Larger data sets are needed for further study.

ACKNOWLEDGMENT

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Development of an Institutional Effectiveness Program for Educational Institutions A Successful Case Study

Michael T. Hoefler, Ph.D., and **Katherine Snelson, B.S.**, Life University

Accrediting agencies, governmental agencies, and the general public are increasingly requiring institutions to demonstrate that they are delivering on the promises made to students and the public. Assessment of institutional

mission and goals depends on the development of an effective model for determining institutional effectiveness. Life University recently revised its institutional effectiveness process from one with deficiencies to one that is effective

and transforming the planning and assessment culture of the institution. The institutional effectiveness process is centered around the continuous improvement cycle model. This institutional effectiveness process is a modified version of the Nichols model for measuring institutional effectiveness.

METHODS

The continuous improvement cycle reporting form provides a template for planning and assessment of goals and standardizes the reporting of results for all areas of the university. The components of the continuous improvement cycle reporting form include institutional goals supported, area mission statement, unit goals, strategic initiatives, assessment methods, success criterion, assessment timetable, assessment findings, use of results, improvement strategies, action plan and date of completion, resources requested, and comments for each goal. The final component of the report is the summary narrative. A rubric is used to assist units with development of the assessment plans, completion of the report, and review of plans by the Institutional Planning and Evaluation Committee (IPEC).

RESULTS

Development of the institutional effectiveness process included review and revision of the institutional mission and

goals, review of unit goals (both with a focus on student learning outcomes), development of assessment strategies, completion of assessment cycles with assessment findings, and use of results. Continuous improvement cycle reports were reviewed by IPEC to determine quality and to determine the degree to which unit and institutional goals were accomplished. During the first year, continuous improvement cycle reports were completed quarterly to facilitate the learning process and to establish a culture of evidence-based assessment and planning. Assessment cycles are currently completed on a yearly basis.

DISCUSSION

The continuous improvement cycle process begins with development of assessment plans for the next cycle, incorporating findings from previous reports. An important component of the plans are strategic initiatives designed to facilitate accomplishment of the unit goals and budgetary impact of these initiatives. IPEC review of plans results in a prioritization of budgetary requests for use during the development of the university budget. Planning and assessment are therefore linked to the budgeting process. The desired end result is continuous improvement of educational programs and administrative and educational support services. The model developed at Life University resulted in commendations from accrediting agencies, is easy to use, and can be modified to meet the needs of different institutions.



Developing a Community for Faculty on Teaching and Learning

Kathryn T. Hoiriis, D.C., and Richard Franz, D.C., Life University

Keeping current with developments in the chiropractic profession and in educational practices can be an overwhelming task without a community effort. New information is often obtained using online resources. Without a formal teaching center available, it was necessary to devise other plans that included faculty Lunch and Learn sessions and journal club meetings with the specific aim to promote discussion of current topics in teaching and learning, as well as scientific research, among faculty.

METHODS

Lunch and Learn is a program centered on topics to improve teaching and learning. Participants brought their own lunch, and sessions started 25 minutes after the scheduled end of morning classes and ended 15 minutes before the start

of afternoon classes. Presentation topics were limited to 10 minutes and a maximum of three overheads, with handouts kept to a minimum as well. Facilitators were encouraged to provide online resource links. Open discussion was held for the second 15 minutes. A call for a facilitator and/or topic at the end of each session occupied the final 5 minutes. For journal club, one to five papers per quarter were selected for review and the list of articles was posted. A meeting would convene in the 8th week of the quarter for general discussion. A specific aim of this journal club is to identify important advances in chiropractic and to stimulate detailed discussions and commentary in this institution among the faculty.

RESULTS

The Lunch and Learn session has featured 29 topics presented by faculty from the various colleges within the

university, on Thursdays of weeks 2, 4, 6, and 8 of each term. There have been two journal club meetings with another planned for September 2005. The Association of Chiropractic Colleges Conference and other educational conferences provide many of the topics for Lunch and Learn. Voluntary participation by faculty with topics of their own and others who are invited to present “timely topics” provide the valuable content of these sessions. Articles selected for discussion in the winter quarter journal club’s first meeting covered the impact of the “evidence-based medicine” concept on the chiropractic profession. The keystone article was published in the *Journal of Social Medicine*. The topic of the second journal club meeting was the discussion of an educational model followed by medical schools published in the *British Medical Journal*. A satisfaction survey has been

done for most of the sessions. The faculty comments have been favorable and the survey includes questions to determine topics of interest for planning.

DISCUSSION

The program has terrific potential and the success that has been achieved is acceptable for its first year. According to Dr. Milton Cox, it takes 5 years to detect a change in the faculty culture following changes in teaching and learning styles. These sessions on teaching and learning have been well received by faculty. This is an area of growth for this institution.



The Online Resources Workshop Series

Kathryn T. Hoiriis, D.C., Pam Shadrix, B.S., and Karen Preston, B.B.A., Life University

In education, instructors are regularly challenged to prepare their students for a rapidly changing world. A willingness and ability to seek new knowledge and understanding is becoming more important than the specific knowledge and skills acquired through formal education. A specific aim of education must be “to learn how to learn.” Successful graduates will be those who are prepared to be lifelong learners. To that end, this paper describes the success of an interactive learning environment provided specifically to enhance those types of skills.

METHODS

The library staff is providing formal training sessions in communication technology and online resources to students at Life University, with the specific goal to introduce skills in using the scientific evidence base and information literacy. To encourage participation, students may earn extra-credit for attendance to these basic skills workshops. Online Resources Workshop Objectives include to search and retrieve specific information from the library resources, such as locating books in the catalog (and stacks) or articles from scientific publications; to provide students with insight regarding the current literature that may provide guidance for them as they progress through their chosen field of study; and to introduce the concept of using an “evidence-based” learning method. Topics covered at each session include library homepage with various links to databases; WebCat—online library catalog; literature search: citation, abstract, full text; Medline; GALILEO; Index to Chiropractic Literature; MANTIS; Sportdiscus; and methods of article retrieval, including interlibrary loans, full text online, and

journal hardcopy. Handouts are provided and satisfaction surveys are completed following each session. Participation in these workshops is reported to each instructor. Instructors hope to use participation to determine effect on performance.

RESULTS

Participation has steadily increased to 58 for spring 2005. Surveys indicate high satisfaction. Two evening sessions were held summer 2005 and yielded 21 participants with 21 completed surveys. As a result, evening workshops will be included in future schedules. In an attempt to determine whether the workshop has had an impact on student performance in an Introduction To Research Methods class, the authors noted that in spring 2005, there were two groups (attended versus did not attend workshop) represented in this convenience sample ($N = 49$). Participation score is 5 points for attending the workshop added to the participation score. The total points are weighted for final grade (25% midterm, 25% participation, and 50% term paper). A point biserial formula was used to compare students’ mean scores. For the whole group (mean = 83.02, SD = 8.469), the coefficient $r = 0.506$. The maximum possible r using this formula is 0.71, at $p = .95$.

DISCUSSION

It is important to track the number of participants and their satisfaction. However, a long-term monitoring process needs to be developed to see if these activities do significantly

contribute to effective lifelong learning. To that end, the authors have developed a follow-up survey. This work is a collaboration among educators, teaching faculty, and library staff, willing to contribute to improving the academic

performance of students. These interactive workshops will prepare students to be better prepared for the future. Success is based on the number and frequency of sessions and participation. Further study using follow-up surveys is needed.



Collecting Analyzable Data on Student Performance During Practical Examinations

Dennis M.J. Homack, B.A., M.S., D.C., C.C.S.P., New York Chiropractic College

Typical practice for evaluating a chiropractic student's level of knowledge and skill include objectively structured clinical examination (OSCE)-style examinations. Collecting and analyzing data from these exams can become a challenging task for the examiner. Presented here is a method of data collection for recording key details of a student's performance on such tests using "scanable" computer exam forms. Data were collected more precisely with minimal effort, while ensuring a more objective and complete assessment of the student.

A method of recording and analyzing the performance of students during practical examinations needed to be developed as part of a component of a new course. The evaluation criteria included basic knowledge, skill, and clinical preparedness as demonstrated in a practical exam setting. The data collected from examinations are intended to be used to compare individual students with overall class performance and expected minimal competencies. The system must also collect data so that trends between classes, sections within classes, and individual groups observed by specific examiners can also be compared and analyzed for corrective actions, if deemed necessary.

METHODS

A system was developed to record the performance of students using a Scantron examination form. This allowed for accurate recording of specific criteria that was consistent between examiners and easy to analyze. The exam format is a multiple-case, timed-station OSCE-style examination. Each case had three stations: a reading station, a performance station, and a follow-up station. The answer form used by the examiners was organized to follow a logical order, to minimize errors in scoring. Notes were used to provide feedback to the entire class as to errors made by students during the exam process. The Scantron forms were read by a scanner that organized the responses into a comma-delineated text file. The text file was opened using an Excel workbook that was created to analyze the data.

RESULTS

One hundred one students were graded for three examinations using this system of scoring practical exams. All examiners and students were in agreement that the process did not add any additional time to recording the answers, that the students were not distracted by the process, and that the examiners were able to pay more attention than with previous systems. Several students were identified as having weaknesses in one or more areas and were given the opportunity to work with tutors on specific assignments outside of class. A significant trend was realized in the area of neurologic evaluation. Action steps were taken to include adding the performance of evaluating neurological systems, including evaluating particular dermatomes, into case studies using the DPO-CEX format (Doctor, Patient, Observer-Clinical Exercise). Subsequent exam results revealed significant improvement in neurologic exam procedures for all students.

DISCUSSION

The use of computer cards to score and record practical exams has provided accurate analyzable data regarding the performance of individuals and entire classes. Scoring in this manner was fast and accurate and increased the ability of the examiner to concentrate on what the student was doing during an exam. The data revealed trends and areas to be worked on for both individual students and entire classes. Corrective actions were taken in the form of alterations in teaching material for the class, and the outcomes of corrective action were easily and efficiently measured. This method is best utilized for advanced and capstone-type courses because of the limitations of individual feedback often useful as a teaching aide in earlier classes. This method of evaluation has been highly successful and is recommended for use as part of a comprehensive evaluative strategy for students, classes, and elements within chiropractic programs.



A Case Report of Reduction of Local Wrist Pain and At-Distance Pain Sensitivity From Nonforce Chiropractic Interventions

Marius R. Hossu, D.C., M.D., and M. Kathleen Maher, D.C., F.I.A.M.A., Private Practice

The purpose of this study was to assess the effect of nonforce chiropractic methods on pain perception and pressure pain threshold in a patient with wrist injury.

INTERVENTION

A 46-year-old female with right wrist compaction injury was treated using a combination of nonforce-type chiropractic methods, specifically bioenergetic synchronization technique and body restoration technique. The local pain and muscle strength was evaluated before and after intervention as well as the pain pressure threshold at distance, on an uninvolved site.

RESULTS

Both subjective and local objective indicators improved after 5 minutes of treatment and general sensitivity to pain

as measured by pressure algometry at distance decreased by 65%.

DISCUSSION

In this instance, the combination of the techniques was fast and effective in inducing both local and distant changes in the body that can be objectively measured. The authors speculate that the energy of the nonforce chiropractic procedures applied to the injured area and to specific symmetrical and axial/spinal points combined with a possible autonomic modulation induced by breathing control affects both local and general mechanisms responsible for pain and neuromuscular integration.



Assessment of Physical Injuries in Male Versus Female Chiropractic Students When Learning and Performing Adjusting Techniques

Laura L. Huber, D.C., and Debra W. Bisiacchi, D.C., Life University

Chiropractors, as well as other health care providers, are vulnerable to musculoskeletal injuries. Technique courses are a required part of the chiropractic curriculum and necessitate that students develop psychomotor skills, as well as strength and agility. In order to master these skills, students are required to perform repetitive set-ups and simulated thrusts. If they can achieve proper body biomechanics and develop upper body strength, then the incidence of musculoskeletal injuries may be reduced, and they can, perhaps, avoid a precipitating factor for additional injuries. The purpose of this study was to survey and identify the types of musculoskeletal injuries that students experienced when learning adjusting techniques in the classroom and performing them in the clinical setting at Life University's College of Chiropractic.

METHODS

Surveys were developed to record musculoskeletal injuries that students may have acquired while attempting to deliver manipulative therapy. The surveys identified characteristics such as gender, age, quarter of study, technique used, and injury recovery time. Students enrolled in 2nd year or above and currently or previously enrolled in technique course(s) met minimum participatory requirements. Informed consent was obtained which familiarized students with the purpose, conditions, and confidentiality of the study. Statistical data were generated by Office of Institutional Research.

RESULTS

There were 125 of 150 surveys completed (83.3% response rate). There were 43 responses from women and 77 from men. Only 1% of the respondents were less than 21 years old, 11% were 22–24 years old, 38% were 25–28 years old, and 50% were older than 28. The majority of the respondents were senior-level students. In this study, the low back was the most common injury site for females (19%), and the neck was most common for males (11%). There was an equal occurrence of wrist injury. A total of 13% of females reported shoulder injuries, whereas only 2% of males indicated similar injuries. Twenty-two respondents (14 males and 8 females) reported that injuries occurred in the learning lab environment, while 19 respondents (8 males and 10 females) reported experiencing injuries while performing manipulations in the clinical setting. Students indicated that practicing or performing side posture procedures was the most common mode producing injuries. Supine cervical moves were the second most common, and prone cervical moves ranked third overall. It was found that 60% of the injuries occurred within

6 months of the survey, and that 35% of injured students are still recovering.

DISCUSSION

Literature review revealed some studies addressing occupational injuries sustained by health care providers. However, little information existed that addressed those experienced by chiropractors, and even fewer studies addressed gender-specific injuries. Data from the completed surveys identified the most common injuries experienced by students and allowed for classification of the injuries by gender, age group, and time frame of occurrence. In addition, the data addressed the techniques that were utilized. A limitation of the study was that the survey was retrospective, requiring students to recall circumstances of injuries that occurred previously. A correlation between body type and injuries sustained will require an additional interview with the students. Identification of these specific anatomical areas provides an integral step toward reducing and/or preventing injuries.



Curriculum Revision Process Steps to Success

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Academicians and administrators must continually revise programmatic curricula to meet the expectations and needs of internal and external stakeholders by reshaping outcome performance goals and supporting course content to better meet external marketplace demands. Many health care curriculum revisers have recently incorporated active learning pedagogies, such as problem-based learning (PBL), to support development of practitioners' abilities to integrate huge amounts of continually changing and disparate course contents. PBL curricula, both in terms of costs and yields, have not clearly demonstrated significantly improved learning outcomes, and this has led others to create hybrid versions of integrative curriculum. This case study reviews one institution's current effort to move toward such a hybrid curriculum, detailing the processes of identifying key change agents, preplanning, timeline development, committee formation, and organizational change strategies.

METHODS

Key change agents, administrators with excellent facilitation and communication skills along with diverse training

across multiple academic and teaching positions, emerged on each of the two campuses to (1) evaluate external practice requirements and realities to inform curriculum revision content changes; (2) evaluate current curriculum assessment instruments, both quantitative and qualitative and make recommendations for changes; and (3) develop a plan to champion the process toward institutional change, cooperation, and implementation.

RESULTS

Initial subcommittees were created to explore and evaluate optimal programmatic length and structure as well as specific new focus areas such as functional assessment, outcomes measures, health promotion, and disease prevention. Additional assessment of current course content was performed. Student, faculty, focus groups, and administrative assessments were reviewed. Initial exploratory committees, under the direction of the steering committee, were now reassigned to new areas of target development that included methods to foster improved vertical and horizontal integration, development of curricular pillars, development of

capstone courses, and evaluation of National Board timing, optimal course sequencing, programmatic length, and transition planning issues. A new curricular model featuring a “balanced” approach to chiropractic education and practice, and the development of an integrative approach to functional, chiropractic, and systemic assessment, was developed that incorporates and integrates chiropractic wellness/preventive care, care aimed at focused neuromusculoskeletal complaints, standard preventive testing, screening, and health promotion counseling. A timeline for implementation in all the focused areas was developed. A Web site was created to facilitate multicampus communication and exchange of information.

DISCUSSION

Curricular content was organized and prioritized by its relationship to a set of curricular pillars identified and agreed upon by all campus constituencies. These pillars

include chiropractic and ancillary techniques, philosophy, patient-centered approach, health promotion, clinical decision making, and homeostasis. As one team evaluated current technique offerings and moved forward with a new approach to teaching chiropractic adjustive and rehabilitative techniques, another team focused on opportunities for integration of basic and clinical science material. This process has not been without challenge. Initial discussions about the technique sequence were tense and resulted in the development of factions within the faculty. Most of the tension was driven by dogmatic adherence of various faculty members to one or another “chiropractic philosophy.” The Steering Committee leadership attempted to address this tension by encouraging the use of evidence to guide discussions—but this only seemed to inflame the controversy. Other challenges centered around heavy teaching and administrative loads of those participating in the revision process—making it difficult to find meeting times to flesh out the new curriculum. Developing a workable transition plan and preparing to launch by the target date have resulted in some difficulty.



Moving Chiropractic Education Into the Public Education Forum The Mount Royal Experience

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With the exception of the Université du Québec à Trois-Rivières, chiropractic education in North America resides in private institutions. Mount Royal, a public postsecondary institution that has been in existence since 1905, has developed curriculum for a proposed Doctor of Chiropractic Program (DCP) using a multitude of resources in the chiropractic community, including data from the Council on Chiropractic Education–Canada, the Canadian Chiropractic Association, and the Canadian Chiropractic Examining Board. Further, the curriculum development committee sought feedback from chiropractors in four western Canadian Provinces through an online survey and face-to-face focus groups in three Alberta cities. The primary focus of this paper is to report the early steps used by Mount Royal to start the curriculum model process.

METHODS

The Mount Royal Chiropractic Curriculum Development Committee (CCDC) developed an online survey and focus group questions on the knowledge, skills, and

abilities required to be a chiropractor. Eight sections were established: chiropractic expert, communicator, collaborator, manager, health advocate, scholar, professional, and educator. The online survey solicited feedback through responses to 204 quantitative questions, and 15 qualitative questions were collected in the online survey. Respondents were asked to answer the quantitative components related to the question at two different points, when they entered practice and currently. A 5-point scale was used (4 = extremely well prepared; 3 = well prepared; 2 = somewhat prepared; 1 = minimally prepared; 0 = not at all prepared/not applicable). Respondents were encouraged to write comments. Qualitative data were collected from four focus groups held in Calgary (two), Edmonton, and Red Deer. Participants were randomly selected by city of practice, and 31 of 40 invited chiropractors attended. Focus group participants had graduated from six different chiropractic colleges. Data were categorized into four major areas: knowledge, skills, attitudes, and experiences. Participants had an opportunity to suggest experiences that Mount Royal should ensure all graduates would have prior to graduation, such as business knowledge and skills, practical experiences (what, when, and how), and group effectiveness skills.

RESULTS

Two hundred twenty-five chiropractors responded to the online survey. Mean scores for how respondents felt about the eight categories upon commencement of practice and currently (in parentheses) were: chiropractic expert, 2.45 (2.50); communicator 1.71 (1.86); collaborator, 1.37 (1.52); manager, 1.56 (1.70); health advocate, 2.13 (2.04); scholar, 1.75 (1.84); professional, 2.17 (1.94); and educator, no questions asked. Seventy-five pages of qualitative comments were collected in the on-line survey. The information was analyzed to identify themes and supporting information within themes. Participants felt it was important to build practical experiences into the curriculum, early and often.

DISCUSSION

Respondents felt they were reasonably well prepared in the chiropractic expert category, but less prepared for communicator, collaborator, manager, and scholar categories.

Respondents felt modestly prepared for the health advocate and professional categories. These themes were reinforced in the qualitative comments. The CCDC has attempted to fill the gaps or ill-prepared components in the curriculum that were identified by respondents of the survey. There are several significant limitations of this study. There were only 225 respondents to the online survey. There was no attempt to randomly choose respondents across the western Canadian provinces and responses may not be representative of the entire chiropractic population. Focus group sample size was small and localized.

CONCLUSION

Mount Royal has utilized internal and external expertise in the drafting of a chiropractic curriculum. Chiropractors from the western provinces have been able to participate in focus groups and online surveys. Although only a small part of the curriculum development has been completed, both the survey and focus groups have supported the process.



Electromyographic Study and Force Production Parameters of the Trunk in Low Back Pain Subjects and Healthy Control Subjects

Catherine Lalonde, B.Sc., **Martin Descarreaux**, D.C., Ph.D., and **Martin C. Normand**, D.C., Ph.D., Université du Québec à Trois-Rivières

Recent research suggests that chronic low back pain patients exhibit deficits in trunk proprioception and motor control. It has been reported that the repositioning accuracy of chronic low back pain subjects was significantly lower than that of healthy subjects. Chronic low back pain subjects also exhibit changes in postural control, delayed muscle responses to sudden trunk loading, and increased trunk movement detection threshold. However, low back pain subjects are able to modulate their control strategy to increase their performance in an isometric force reproduction task.

The main objective of this study is to determine whether chronic low back pain subjects modulate the time to peak force only by modifying the duration of trunk muscle electromyographic (EMG) bursts or by adjusting agonist/antagonist activity. Investigating EMG patterns of chronic low back pain subjects may eventually be helpful in the development of new clinical evaluation and intervention.

METHODS

This study was reviewed and approved by the Université du Québec à Trois-Rivières (Canada) Ethics Committee.

Fifteen control subjects and 14 patients with low back pain participated in this study. Study participants were required to exert 50% and 75% of their maximal trunk flexion and extension. In a learning phase, visual and verbal feedback was provided to participants. Following these learning trials, study participants were asked to perform 10 trials without any feedback. During each trial, spatio-temporal parameters of muscular activity (EMG of erector spinae, rectus abdominis external oblique, and multifidus muscles) and force production were recorded. Kinetic dependent variables included time to peak force, time to peak force variability, peak force variability, and absolute error to target. Electromyographic dependent variables included EMG burst duration for agonist muscles, amplitude of EMG using numerical integrated techniques, and a ratio of agonists/antagonists.

RESULTS

The average time to peak force was significantly longer for low back pain subjects than for the healthy subjects (420 ms vs. 299 ms, respectively). No group difference was observed

for peak force variability and absolute errors. Low back pain subjects showed longer burst duration for all four muscles recorded. Agonist/antagonist ratios and EMG of individual muscles were similar in both groups.

DISCUSSION

The results of the present study indicate that chronic low back pain subjects have longer time to peak force than normal subjects when attempting to reproduce isometric force. However, their spatial precision and variability are

similar to normal subjects. Electromyography data point out that there was no decrease of agonists' activity and no increase in antagonists' activity as the EMG of all muscles and agonist/antagonist ratios were similar in both groups across all conditions. It seems that, in order to avoid pain (fear avoidance behavior), chronic low back pain subjects augment the duration of force production by increasing muscle contraction. Since only superficial trunk muscle activity was recorded during the experiment, it is possible that the longer time to peak force observed can result from increased cocontraction of deeper trunk muscles. Future studies using intramuscular EMG are needed to explore this hypothesis.



Headache Due to Intracranial Aneurysm A Case Study

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The purpose of this paper is to briefly describe the case of headache later found to be due to intracranial aneurysm, and to raise awareness of the red flags that should lead the chiropractor to suspect the presence of this dangerous condition.

CLINICAL FEATURES

A 32-year-old female sought care for a constant headache of 4 days' duration. She described the headache as severe throughout her entire head, centralized at the base of the occiput, and unlike any headache she had experienced in the past with accompanying neck pain. She also reported that approximately 12 hours after the onset of the headache her left eye deviated toward the midline. It was also tearing excessively. She appeared to be in acute distress, and the convergence of her left eye to the midline was quite notable. Her left pupil was fixed and dilated, with deviation to the midline. Assessment of vitals revealed blood pressure of 139/96, pulse 76 and regular, and respiration rate of 16. The patient was overweight and a smoker. Her past history included a significant cervical acceleration/deceleration injury. The clinical presentation suggested that a cerebral vascular accident was a probable differential diagnosis.

INTERVENTION AND OUTCOME

With the strong probability that a cerebral vascular accident was likely, it was felt that her situation was potentially life threatening. Therefore, no chiropractic adjustment was administered. Instead, immediate transfer for emergency treatment was arranged. The emergency room was notified of her condition, vital signs, and probable diagnosis of cerebral vascular accident. The diagnosis of a bleeding intracranial aneurysm was confirmed via MRI. She was transferred to a local university hospital for surgical intervention. Unfortunately, she died as result of vasospastic complications from the aneurysm.

CONCLUSION

The "red flags" to be considered in evaluating the patient include history of hypertension, cigarette smoking, oral contraceptive usage, alcohol consumption, pregnancy, and use of cocaine. Doctors of chiropractic need to be aware of the signs and symptoms that indicate that a headache may be due to more serious problems such as aneurysm.



Improving Collaboration and Quality Through the FISH! Philosophy

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New York Chiropractic College (NYCC) recently implemented the FISH! philosophy in an effort to improve quality and morale with stakeholders. FISH! uses four main concepts to address key concerns such as improving quality, morale, productivity, team building, and customer service. As we have worked through the training process, NYCC has seen many positive changes in the academic and workplace environment. The purpose of this paper is to share the FISH! philosophy, to explain the approach taken to implement this program, to demonstrate how NYCC is accumulating data to evaluate the improvement of the quality of the workplace, and to explain how NYCC is working to ensure the continuation of FISH!

METHODS

After receiving senior staff approval, managers and supervisors were trained and introduced to the FISH! philosophy with the four principles of “play,” “be there,” “choose your attitude,” and “make their day.” Next we worked with staff to bring them on board with the approach, followed by Health Center personnel and faculty. Lastly, we opened the training to the Student Government Association, interns, and work-study students. A survey quantifying the effects on workplace attitude of employees was taken during these training sessions.

RESULTS

Pre- and posttraining survey results will be compared at the end of a 6-month period to evaluate the change of the workplace with regards to organizational behavior. The survey questions concentrated on the individual’s perception of the four FISH! principles and how they were viewed at

an institutional and departmental level. The evidence in the pretraining survey of 127 participants demonstrated a significant difference in alignment (6 percentage points) between perceptions of how departments versus the institution used the FISH! principles. During the training sessions, comments were made regarding methods of closing that gap, which are being implemented to increase morale and customer service.

Results of a follow-up survey indicated that 59% of respondents have been more “FISH! like” in their behavior since the philosophy was outlined. The most common responses included importance of FISH! being modeled by senior staff, managers, and supervisors (12 responses); positive comments—“keep FISH in people’s face” (13 responses); importance of incentives and recognition (9 responses); and negative comments—won’t work (4 responses). Verbal response by employees as well as students indicates that there is a positive change at NYCC. As we progressed through the staff training, there were many questions from students as to what is FISH! and that there seemed to be a change in attitude in many departments.

DISCUSSION

We have recently implemented the training but are already seeing the “ripple” effect. The magnitude of change will be quantified comparing the pre- and posttraining surveys. We have instituted a FISH! Tales newsletter to managers and supervisors with ideas on how to keep FISH! alive in their departments. Other attitude and motivational programs are being considering to shift organizational behavior and to improve quality health care through these soft skills. As employees continue to model the principles and students are exposed to the effects of the FISH! philosophy, we expect students to carry these principles into practice resulting in higher quality health care for their patients.



Evidence to Support the Assessment of Diagnostic Imaging Skills in Booklet Form Versus a PowerPoint Assessment

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The Canadian Chiropractic Examining Board (CCEB) has been evaluating chiropractors wishing to be licensed/registered

in Canada since 1962. There have been many types of examinations offered by the CCEB since that time—from essay to

objectively structured clinical examinations (OSCE). At the time of this research project, candidates' diagnostic imaging interpretation skills were assessed at the same time as the OSCE with multiple-choice questions. Candidates responded to slides from a PowerPoint presentation. The psychometric consultants to the CCEB had recommended moving the diagnostic imaging examination from the OSCE to the written examination. Past experience of the CCEB with measuring diagnostic imaging skills and candidate feedback suggested that candidates would not be supportive of such a move. In the past some candidates had objected to booklet forms. Booklet forms had the potential advantage, however, over actual films of allowing to candidate to assess more cases and to avoid the influence of first-case jitters common to actual films on a viewbox. The purpose of this research project was to determine whether candidate scores were influenced by whether they were assessed by booklet or PowerPoint form.

METHODS

The diagnostic imaging examination consisted of 16 cases: 8 PowerPoint and 8 booklet images, with 3 multiple-choice questions per case. Two different examinations were used, A and B, with all cases and questions being common to both examinations. The morning group of candidates was assessed with PowerPoint examination A and booklet examination B. The afternoon group (uncontaminated by the morning group of candidates) was examined with PowerPoint examination B and booklet examination A. The crossover study was done to determine whether the booklet examination scores were equivalent to the PowerPoint examinations. For this examination, the images from the PowerPoint presentations were printed in booklet form. This resulted in a lower resolution in the booklets than can be achieved by printing directly from image files. Internal consistency was estimated with Cronbach's alpha. Analysis of variance (ANOVA) was performed on morning and afternoon candidate scores to determine whether one method of examination

was significantly different. Descriptive statistics were also calculated for the four examination groups. Candidate feedback was reviewed.

RESULTS

Eighty-two candidates were assessed, 42 in the morning group and 40 in the afternoon group. Estimates of internal consistency for the examinations (alpha) ranged from 0.64 to 0.71. The four examination groups and their mean percentage scores were: (1) PowerPoint A, 87%; (2) booklet A, 88%; (3) PowerPoint B, 91%; and (4) booklet B, 92%. Both morning and afternoon candidates scored higher on the booklet forms of the examination. The ANOVA found no differences between the performance of candidates between booklet and PowerPoint forms ($F = 2.18$, $p = .10$). Feedback from candidates included the expected concern over image quality, but also feedback that candidates preferred the booklets because they could set their own pace. Some candidates experienced wavering attention during the PowerPoint presentation when easier cases were on the screen for the same amount of time as more difficult cases.

DISCUSSION

Although assessment of competency is not a popularity contest, it is important to consider candidates' responses to changes in testing procedures and to ensure such changes do not negatively impact the performance of candidates. Even though the booklet images did not have as high a resolution as possible from direct printing of image files, candidates were not disadvantaged by the move to booklet form, and many candidates voluntarily provided feedback that they preferred the booklet form. This research project is limited somewhat by the sample size, both from the perspective of candidate numbers and items on the test.



The Delayed Effect of Spinal Cord Injury on the Neuromuscular Junction

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Spinal cord injury costs the American economy billions of dollars every year because most of the individuals injured are under the age of 32. It has long been thought that regeneration of the central nervous system is impossible. This belief is changing with new techniques in stem cell research and neurotrophic factors. To assess the changes in central

nervous system repair, assessment techniques must be developed in concert with these new repair methods. One new method of rehabilitation is the use of functional electrical stimulation to the peripheral nervous system. One assessment technique is "jitter," which measures the stability of the end-plate potential. The purpose of this study was to assess the

stability of the neuromuscular junction in spinal cord injury with functional electrical stimulation used as a rehabilitation technique.

METHODS

Fifty adult male Fischer rats had a spinal cord contusion injury performed at T9. Basso–Beattie–Bresnahan scores were assessed and those animals with a score of 12 or less were used to assess the effect of functional electrical stimulation. These remaining animals had a functional electrical stimulation device implanted and connected to the peroneal nerve. The functional electrical stimulation device was turned on for 1 hour, three times a day, for 45 days. A second group had the functional electrical stimulation device implanted but not turned on. After 45 days the jitter value was measured for the extensor digitorum longus.

RESULTS

The normal jitter value for the extensor digitorum longus is 9.8 μ s. The functional electrical stimulation group had a

jitter value of 15.1 and the sham group (functional electrical stimulation not turned on) had a jitter value of 19.2. There was a statistically significant difference between the spinal cord injury groups and the normal values. The functional electrical stimulation had a more stable end-plate potential when compared with the sham group.

DISCUSSION

This study showed that the end-plate threshold after spinal cord injury was less stable than normal, a finding that has been shown in peripheral nerve injury and demyelinating diseases of the central nervous system. Of particular interest was the fact that when the peripheral nervous system was stimulated after spinal cord injury, the stability of the end plate was statistically improved when compared with animals that did not have stimulation. These results suggest that jitter is a usefully physiological measure to assess the peripheral nervous system after severe spinal cord injury. This study further supports the idea that functional electrical stimulation helps stabilize the neuromuscular junction after an upper motor lesion and that functional electrical stimulation may be helpful in the rehabilitation of the patient after such injury.



Can an Athletic Event Expose Chiropractic Externs to Conditions That They Will Frequently See in Practice?

Dennis P. Lopez, D.C., D.A.B.C.O., **James V. Owens**, D.C., and **Connon Piencikowski**, A.T.C., C.S.C.S., Palmer College of Chiropractic

In order to prepare students for evaluation of injuries that they will frequently see in practice, the authors propose that athletic events such as a rugby game can be a valuable learning tool because of the high incidence of sprain/strain injuries related to a high-speed sport that includes high-impact contact.

DESIGN

This single group observational study involved an athletic event (rugby tournament) in which the Palmer Sports Council externs examined and evaluated injured players. Prior to the event, student externs were given two training sessions to practice O'Donoghue's maneuver on the spine and extremity joints.

PRIMARY OUTCOME ASSESSMENT

Primary outcome was the number of positive tests in performing O'Donoghue's maneuver in the cervical and lumbar spine along with a modified O'Donoghue's maneuver in the extremity joints to evaluate for sprain/strain injuries. Secondary outcome was the incidence rate of the sprain/strain injury as it relates to player position on the team.

RESULTS

The total number of players examined was 147. The number of players injured was 53, and 63 players had positive O'Donoghue's. Thirty-two players had positive strain/sprain

exams for cervical spine, 17 for the lumbar spine, and 13 for the extremities. The most frequently injured players were the flankers and props.

DISCUSSION

This study provides support that sporting events allow the opportunity to improve student skills (psychomotor and

critical thinking) in evaluating sprain/strain injuries. A high number of positive tests indicate that rugby players suffer frequent sprain/strain injuries to the cervical spine, lumbar spine, and extremities during tournament play.

Chiropractic, Contemporary Culture, and Patient Education

Cynthia J. Lund, C.T., A.L.C.P., Life University

Chiropractors and chiropractic educators may wish to review trends in contemporary culture relevant to patient education programs. Incorporating new perspectives may deepen significance and understanding of chiropractic for a sizeable group of patients and potential patients. A generation of people has challenged cultural institutions and influenced society as it has matured. This group has espoused new political priorities, advocated for environmental change, challenged traditions, and made new demands on products and services. These people, 78 million in number, are the baby boomers, and much has been written about their influence in society, especially as consumers. They have, in fact, defined consumerism. This paper suggests that chiropractors should examine how patient education programs acknowledge and accommodate the differences and the demands arising from this generation's different perspective on health.

DISCUSSION

Looking at this issue requires setting aside differences in opinion about why people should come to the chiropractor, and focusing on what experts in marketing, business, and culture trends are writing about: establishing relevant, thoughtful, meaningful connections with patients. People visit a chiropractor for a variety of reasons. When they do, the communication needs to acknowledge the significance of quality of life, self-determination, and self-awareness. Patient relationships must be grounded in authentic improvement and relevance in patient outcomes, and communicated in a way that strengthens meaning and deepens the chiropractic experience.

Why do we educate patients? Chiropractic patient education programs may not necessarily be based on patient need; they may be shaped by the needs and objectives of the doctor. Established programs may not capture what patients say they want: personal interaction, acknowledgment of needs, and

outcomes relevant to quality of life and self-awareness. Envisioning new possibilities for patient education might mean becoming more culturally aware, creative, and innovative. Although the development of a new patient-doctor relationship in a new marketing model and within a new paradigm has barriers and challenges, some health care providers are confronting the difficulties because of the need for change.

Wellness centers are combining business and marketing sense with the baby boomer's insistence on communication, self-empowerment, and the defiance of aging. These programs employ not doctors, but "wellness coaches" who work with the patient and the doctor to be a conduit of information and relationship. A notable example of the medical community realizing the impact of the baby boom generation and then changing its approach to patient education and wellness is Kaiser Permanente. Kaiser, the largest health maintenance organization in the country, has launched the first phase of an \$80 million marketing campaign called "Thrive." The reasons presented for the company's new approach include acknowledgment of the new health paradigm: the need for life balance, personal empowerment, partnership, and caring for the patient's physical, emotional, and spiritual growth. The company has agreed upon an image and targeted the baby boomer generation whom they describe as health seekers wanting relationship, health education, wellness, prevention, and self-care.

As a profession, we may not have an agreed-upon identity or an \$80 million marketing budget. But, as individual chiropractors and educators, we have the strength of our intentions and the ability to review, revise, create, and change quickly. We can learn about contemporary culture, anticipate the future, hear what our patients are saying, and develop more meaningful ways to engage them. The baby boomers seem to be insistent upon having what chiropractic offers. We can consider taking current patient education and adding personal, contemporary, thoughtful, and savvy communication styles that address the needs of a modern culture.



Bridging the Gap: Introducing Chiropractic Services at a University Student Health Medical Center

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This paper discusses the introduction of chiropractic services at a university student health medical center. The literature does not contain much in the way of descriptive examples of medical–chiropractic integration and this does not assist others in developing and increasing the number of successful collaborations. It is imperative for colleges and private practitioners to share their experiences so that best practices for forming medical–chiropractic interdisciplinary relationships can be duplicated and multiplied throughout the nation.

BACKGROUND

The relationship between Cleveland Chiropractic College (CCC) and the medical faculty at the University of Southern California Student Health Center (USC) began approximately 2 years ago. Some of the faculty members at the USC Student Health Center were interested in offering some form of alternative and complementary care and this influenced the medical director to investigate their options in offering chiropractic and acupuncture. The medical director for the Student Health Center contacted the clinic director at CCC to inquire as to whether CCC would be interested in discussing the possibility of providing chiropractic services at the Student Health Center. A meeting was arranged with the medical director followed by a presentation to the entire medical staff. The medical staff was comprised of various medical specialists and represented the full spectrum of opinion regarding chiropractic, from positive to negative. During the initial presentation, many questions arose regarding chiropractors' beliefs in treating organic dysfunction. This was addressed by stating unequivocally that, while there was a long-standing belief of this within certain segments of the profession, the college was there to help student patients with uncomplicated, nonradicular, back, neck, and tension-type headache problems. For all intents and purposes, this was the end of any barriers to further discussions.

METHODS

Operationally, patients were referred by the staff medical doctors as well as the physician assistants, physical therapists, and acupuncturist, or they made an appointment directly without the need for a referral. All student patients were examined by the nursing staff prior to any treatment. Examination consisted of a personal/confidential history, vitals, present medications, and family history. Patients were primarily seen and treated by an intern. However, this was accomplished under constant supervision by a licensed chiropractic doctor. The licensed chiropractor is in the treatment room constantly supervising the intern throughout the history, examination, diagnosis, and treatment of the patient. Chiropractic treatments initially focused on the areas described above, yet, as the efficacy of chiropractic services became readily apparent secondary to student-reported treatment outcomes, further areas of the body and other conditions were added to the list of chiropractic indications. This is an essential point to remember and a pathway that is typical of healthy, working medical chiropractic collaborations.

DISCUSSION

Within the chiropractic profession, and particularly the chiropractic research community, there is strong interest in enhancing the profession's movement toward greater integration of chiropractic care into health delivery systems. Although there have surely been successes, the methodology and strategies that have led to integration opportunities have not been widely published as models for others. With careful planning, training, and sensitivity, chiropractors can integrate their services into more traditional venues. Training and use of good communication skills are critical for chiropractors within these settings.



Reduction of Postsurgical Sequelae by Chiropractic in a Patient With Poland's Syndrome

A Case Report

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This case report discusses the chiropractic management of a patient with Poland's syndrome experiencing constant postsurgical pain. Poland's syndrome consists of several anomalies, most characteristically including unilateral aplasia of the pectoralis major, anomalies of the thoracic cage and bones of the ipsilateral upper extremity, and ipsilateral breast, nipple, and areola. This patient had undergone four major breast surgeries over a period of 7 years. Following the last surgery, the patient experienced constant pain, which was significantly reduced with chiropractic management.

CASE REPORT

The patient was a 23-year-old Caucasian female of otherwise normal and healthy appearance who presented to a local university student health center with severe pain at the medial aspect of her right breast and a large part of the right hemithorax. Movement of the right arm exacerbated the pain, particularly at the costovertebral and costosternal articulations. The area surrounding the right breast was exquisitely tender. The musculature in the region was tender and in spasm with multiple myofascial trigger points. Motion assessment revealed joint hypomobility throughout the cervical and thoracic spine and at multiple costosternal and costovertebral articulations. Therapy primarily consisted of chiropractic

manipulative therapy (CMT) in conjunction with manual trigger point therapy (TPT) and electrical muscle stimulation. Initial treatment was extremely gentle. However, with each subsequent treatment, more aggressive CMT and TPT were possible. Ultimately, stretching exercises were added. After 6 weeks of treatment, the patient had minimal, intermittent discomfort, and was able to resume her job as a swimming instructor.

DISCUSSION

Patients with Poland's syndrome may need several surgeries for cosmetic or functional reasons. In some cases, postsurgical pain results due to fascial and myofascial restriction and joint hypomobility. Additionally, unique biomechanical alterations may be present as a result of anomalies seen with this syndrome. Effective relief of pain in postlumpectomy patients using myofascial release has been reported in the literature. However, a search of the literature did not find any previously reported cases of chiropractic management of postsurgical complications in patients with Poland's syndrome. This case demonstrates the successful use of CMT, TPT, and therapeutic exercise in the management of postsurgical pain in a patient with Poland's syndrome.



Low-Level Laser Therapy on Knee Osteoarthritis

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Pain, especially its chronic form, is a complex process. It can deeply affect a person's life, forcing alterations in professional, private, social, and everyday activities. Knee pain is the third most frequent ache reported today after low back pain and headache. Previous research studies have suggested that low-level laser therapy might be effective in pain management.

The objective of this study was to assess the effectiveness of low-level laser therapy in the treatment of chronic knee pain. The null hypothesis put forward in the

study was that low-level laser therapy had no effect on osteoarthritis.

METHODS

The study was approved by the Institutional Review Board of a university. The research study consisted of a multisite, placebo-controlled (double-blind), randomized clinical trial.

Subjects suffering from chronic knee pain were randomly assigned into control and experimental groups using a random table. Only the experimental group received active laser treatment. Sham laser was used in the control group. The primary outcome measure was based on the visual analog scale (VAS) score, expressed as the percent reduction in VAS score between the baseline value and the 30-day post-treatment VAS score. The INSIGHT 50 laser (USA Laser, Virginia) was used as an adjunctive modality to standard treatment for knee pain using manipulative techniques. The manipulative treatment techniques were consistently applied as a baseline therapy to all participants regardless of their laser assignment into either experimental or control group. The laser probe consisted of a cluster of five pulsed 910-nm near-infrared laser diodes. The laser probe was capable of emitting laser energy in the near infrared with a maximum of 50 mW average power per diode. The multiple laser probe was used in direct contact with tissue in order to emit photons into the tissue according to a preprogrammed protocol.

RESULTS

The 124 participants were randomly assigned to either the “laser active” or “laser sham” group. Of these, 101/124

subjects completed the 30-day treatments. There were statistically significant differences between the active and sham laser groups at visit 12 and 30-day follow-up. In addition, there were nonsignificant trends at baseline and treatment visits 1, 3, 6, and 9. For each of these results, the active laser group’s mean VAS scores were lower than the sham laser group’s mean score.

DISCUSSION

The resulting outcome measures obtained from the clinical trial demonstrate that the INSIGHT 50 laser provided significant relief and improvements in the primary evaluation criteria. The null hypothesis was rejected. This finding was consistent with other studies. The mechanism of the significant pain reduction was not clear. Based on recent study, it is possible that low-level laser therapy improves blood circulation, especially microcirculation. Laser was found to be effective in repairing damaged cartilage in joints and promoting healing.



A Survey of University Faculty Attitudes and Awareness About Research and Scholarly Activity

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Life University recently shifted its research activities from a highly centralized “research center” structure into a more decentralized, inclusive structure that seeks to encourage and support widespread faculty involvement in research and scholarly activities. An effort is underway to tie promotion, rank, and tenure to these activities. In an effort to facilitate this process, a survey was conducted to determine faculty’s attitudes toward the conduct of research and scholarly activity.

METHODS

A survey was designed and distributed to faculty during a faculty work week. There were 13 items that surveyed the faculty on their attitudes in the following areas: knowledge of the shift in research and scholarly activities; attitudes toward research and scholarly activity; likelihood that they would participate in research and scholarly endeavors; and attitudes toward tying promotion, rank, and tenure to these activities.

RESULTS

Surveys were returned by 88/120 faculty members. Analysis of the survey response data revealed that the majority of faculty were not familiar with the shift in research and scholarly activities, though the majority are committed to engaging in such efforts. The majority of the faculty also felt that research and scholarly activities should be considered during promotion, rank, and tenure decisions.

DISCUSSION

Issues of participation in scholarship and how it is defined and compensated are ongoing and contentious issues within academia. The literature suggests that chiropractic programs have failed to produce opportunities for faculty as researchers and some advocate for greater institutional and professional support of research within the schools and the profession. Others have discussed the issues of institutional support for

the conduct of scholarship. The role of research, service, and scholarly activity embodied by the institution's mission plays a key role in empowering faculty and encouraging a commitment on the part of faculty to engage in the work of the institution. The contention is that empowered and

committed faculty will identify with the mission, values, and goals of the institution and will want to maintain membership in it. It is further hoped that a successful outcome at this institution could serve as an example for other institutions struggling with similar issues.



Professionals' Conceptualization of Work Defining Intra- and Extraprofessional Variation

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Theory dictates that academic knowledge is structured by abstractions used to define professional jurisdiction, and that the public claim for control of work requires externally perceived professional unity. Need for chiropractic external unity has been discussed for over a decade. One challenge to unity is a confusion of normal intraprofessional discourse and debate versus professional discord and division. This research sought data and definition for the varied schools of intraprofessional thought. Hypothetically, the chiropractic subgroups represent normal internal disputes. Understanding the differences can be achieved through text analysis of opinion expressed by intraprofessional groups.

METHODS

Professional abstractions were defined by analysis of word use, word influence, clustering, and resonance between representative examples of professional text. Two sources of text were chosen. Expert opinion was surveyed among attendees at the 2000 World Federation of Chiropractic/Association of Chiropractic Colleges Conference on Philosophy in Chiropractic Education. Attendees answered: "In your words, please describe the types of health problems addressed by chiropractors." Response representativeness was assessed by group membership and comparison with similar literature constructs. Responses were categorized by similarity into six groups and randomly presented to a blinded three-judge panel. Judges independently assigned each response to a group. Disagreements were resolved by majority vote. Results were assessed via centering resonance analysis (CRA), translating text into networks, and evaluating word influence according to hierarchical position. Cluster analysis evaluated group interrelationships. The second source came from published articles. The *Journal of Manipulative and Physiologic Therapeutics* (JMPT), 1978–2004, and *Journal of Vertebral Subluxation Research* (JVSR), 1996–2004, abstracts were electronically scanned. Text was

assessed independently by source and year via CRA. Cluster analysis evaluated relationships. Influence of word use was similarly gauged for both text sources, as the ratio of the sum of positive and negative terms to neutral terms.

RESULTS

A total of 64 usable expert opinion responses, representing 15 countries, were received. The majority of responses reflected biomechanical/somatic pain. Two subgroups, one describing only general health issues (11%) and the other describing only subluxation-related optimal health issues (17%), were identified. Expert opinion cluster analysis showed two groups. One contained the four subgroups describing biomechanical/somatic pain. Common influential word pairs were "neck pain," "lbp, neck," and "effect health." The other contained the two subgroups. One subgroup focused on general health alone. The other used phrases on subluxation and optimal health. Common influential word pairs were "subluxation, vertebral," "health problem," and "interference vertebral." Greater intensity (positive + negative words: neutral words) was found for the subluxation/optimal health group ($t = 4.61$, $p = .01$). Article cluster analysis also resulted in two clusters: JMPT (1989–2004) and JMPT (1978–1988) + JVSR (1996–2004). Influential words and pairs for the first were "chiropractic," "patient," and "interpedicular sensation." The second used "care chiropractic," "back pain," and "back low." Comparative coherence was statistically significant ($t = 4.07$, $p < .01$) favoring the JMPT 1989–2004 cluster, as was the measure of intensity ($t = 2.09$, $p = .05$).

DISCUSSION

Expert opinion indicated a majority of chiropractic abstraction related to biomechanical/somatic pain, with

additional general health concerns. One minority subgroup considered general health problems only and the other considered subluxation only. Cluster analysis verified the distinction between the groups. Word intensity was greater for the smaller group. Articles clustered, early JMPT + JVSR versus later JMPT, were based on similarity in characteristic word use. Coherence for later JMPT was the strongest. Influence words and pairs, in contrast to expert opinion, involved somatic concerns for all groups.

CONCLUSION

The clusters found present an interesting challenge. Opinion-related responses showed stronger polarization over inclusion of somatic/biomechanical problems as professional domain, whereas the abstract-based text did not. Rhetoric within the profession regarding professional domain may be different from the written materials on which abstractions and, ultimately, jurisdictional control are based.



Measuring Clinical Teaching Effectiveness in a Chiropractic College Outpatient Clinic

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Clinical teaching is a complex undertaking that encompasses a number of variables including instructional, personal, and interpersonal attributes. Instruments that rate teaching effectiveness, including both positive and negative feedback, can help clinical instructors improve their teaching. The focus of this study was to determine whether student ratings of clinical teaching effectiveness change significantly over a 6-month clinic rotation in a chiropractic college outpatient clinic. The rating form, adopted and modified (with permission) from an instrument used at the Cleveland Clinic in Ohio, is reported to represent important theoretical clinical teaching constructs and stated to be reliable, valid, and generalizable across 144 residency and fellowships at that institution. The hypothesis tested was that rating results feedback, given to clinical teachers, would lead to an increase in the rating item means of clinical teaching effectiveness over a 6-month clinic rotation.

METHODS

Bimonthly rating interval responses to the Canadian Memorial Chiropractic College Cleveland Clinical Teaching Effectiveness Instrument for the period June 2002 to May 2003, used in this study, were initially collected by the chiropractic college clinic administration. Prior to use in this study, a confidentiality-preserving process was used to ensure that the privacy of the rated faculty was protected. The instrument includes 16 items on clinical teaching behaviors using a 5-point Likert scale with an additional nonnumerical "not applicable/don't know" response. There were 153 students assigned to 22 clinical faculty during that time period. Of the total clinical faculty, 11 had sufficient rating form data to include them in the study. The nonparametric Wilcoxon

signed rank test was used to test the differences between time periods.

RESULTS

The results show that the item means of the rating instrument are high initially and remained high over a 6-month rotation. The reliability alpha, for all items, was high at 0.95 and 0.96 for the first and last rating interval, respectively. One hundred seventy-six item response means were calculated across 11 clinical faculty, showing that 64% of item means increased, 22% decreased, and 14% remained unchanged. Significant change, at the $p < .10$ level, was seen in six item means (3%) that decreased and 36 item means (20%) that increased over a 6-month rotation.

DISCUSSION

Rating item means were found to increase over a 6-month rotation. While the high mean results suggest a ceiling effect and difficulty in differentiating between clinical teachers of higher or lower ability, they also suggest that the faculty were generally teaching effectively, as rated by students. Two-thirds of the item means increased over a 6-month rotation with one-fifth of those means increasing significantly. Because the instrument responses are shared with the clinical faculty at bimonthly intervals, a plausible explanation for the increased ratings over a 6-month rotation is that clinical faculty reflect upon the results and take them into consideration as they go about their teaching responsibilities.



Relationships Between Cervical Passive End-Range Capability and End-Range Discomfort

Development of an End-Range Discomfort Index

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Previous investigations have demonstrated highly consistent and highly significant effects of unilateral spinal adjustments in normalizing left-right passive motion asymmetry in asymptomatic subjects. However, examination of other parameters (e.g., end-range discomfort), which might be associated with restrictions of passive end-range capability, were not included in those studies. Therefore, it was decided that an assessment of the degree of discomfort at end range experienced by asymptomatic subjects with passive motion asymmetry was in order.

METHODS

This study was reviewed and approved by the Institutional Review Board of the Palmer Center for Chiropractic Research. Volunteer chiropractic students ranging from 22 to 43 years of age were selected as subjects and a cervical range of motion (CROM) pendulum goniometer (Performance Attainment Associates, St. Paul, MN) was used for passive end-range assessments. The CROM has been previously validated as an accurate measuring device for analyzing cervical range of motion. Starting from the neutral position, five left and five right alternating passive lateral-flexion end-range measures were obtained from each subject. As in earlier studies, subjects were instructed to relax and close their eyes prior to each measure. In order to control for operator bias, the goniometric assessor stood behind the seated subject, and all measurements were read and recorded by another experimenter who stood in front of the subject. Seated subjects were instructed to rest their forearms on a table in front of them during the alternating measures, so as to keep "shoulder roll" to a minimum. Additionally, immediately following the first and again following the last of the five alternating measures, subjects were instructed to indicate the degree of discomfort they experienced at end-range. A 10-point numeric discomfort scale was employed for end-range discomfort determinations, with a score of 10 defined as "ouch—stop, that hurts."

RESULTS

As in earlier studies, mean left versus mean right goniometric differences of 5° or more were always significant at $p < .05$ levels or better, whereas mean left versus mean right differences of less than 5° often did not meet .05 levels of significance. On the other hand, mean left versus mean right differences greater than 10° were always significant at $p < .001$ levels of significance or better. Furthermore, there was a strong correlation between the magnitude of end range asymmetry (i.e., left-right difference) and the severity of discomfort experienced when subjects were taken to their most restricted side of end range. For passive end-range differences of less than 10°, discomfort scores all fell between 0 and 5 on the discomfort scale (mean, 1.8 ± 1.1), whereas for passive end-range restrictions of 10° or greater, end-range discomfort scores all fell between 4 and 9 (mean, 6.4 ± 1.6). Interestingly, in subjects exhibiting mild restrictions of less than 10°, discomfort scores were higher when the subject was taken to his or her most restricted side, but the discomfort was always experienced on the contralateral side of the neck. On the other hand, in subjects exhibiting more severe passive end-range restrictions of greater than 10°, not only were end-range discomfort scores much higher, but were experienced on the side of the neck ipsilateral to the side of most restricted end range.

DISCUSSION

These results suggest that mild end-range restrictions may merely be caused by a "tugging" action against relatively hypertonic contralateral muscles, most likely superficial ones. On the other hand, more severe end-range restrictions may primarily involve the deep intravertebral muscles ipsilateral to the side of most restricted end range or may involve discomfort emanating from articular structures consequent to aberrant joint biomechanics.



Searching for Chiropractic Literature

A Study of MEDLINE Indexing of the *Journal of Manipulative and Physiological Therapeutics*

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One still hears from critics of the chiropractic profession that there is no research about chiropractic or by chiropractors or that chiropractic is unscientific. One possible reason why this myth might continue is the difficulty in searching for chiropractic research. The *Journal of Manipulative and Physiological Therapeutics* (JMPT) has been the preeminent chiropractic scientific journal and was the first chiropractic journal indexed in MEDLINE. Given its status within the chiropractic profession, the likelihood is that the majority of the papers published in it are by and about the chiropractic profession. MEDLINE currently contains over 13 million citations. However, the ability to search exclusively within the contents of JMPT offers a unique opportunity to determine the best methods to find research by or about chiropractors, because of the manageable size of the data set. The purpose of this study was to investigate the accuracy of indexing of chiropractic generated or related research in MEDLINE using papers published in JMPT as the sample.

METHODS

The MEDLINE database of biomedical citations and abstracts was searched for citations from JMPT with limits that were set to each of the publication types used by MEDLINE (clinical trials, randomized controlled trial, reviews, meta-analysis, practice guideline, letters, editorials, and studies involving human subjects). Additionally, the search was limited to those papers classified as systematic reviews using the search term *systematic[sb]*. Each of the citations identified within a publication type were searched using the Boolean operator NOT and the MeSH terms *chiropractic* or *manipulation, chiropractic* to find those papers within each publication type that were not indexed by NLM with either of these terms. JMPT citations identified as being from the highest forms of clinical evidence (reviews, meta-analyses, randomized clinical trials, and clinical trials) were analyzed by reviewing the complete MEDLINE record to determine whether each study was associated with chiropractic. From these data, the following were calculated: sensitivity; specificity; and positive and negative likelihood ratios with 95% confidence intervals of using the MeSH terms *chiropractic* and *manipulation, Chiropractic* to

identify chiropractic literature in the JMPT MEDLINE data set.

RESULTS

In August 2005, there were 1,899 total citations from JMPT in MEDLINE. A total of 702 citations from JMPT were not indexed using the MeSH term *chiropractic* or *manipulation, chiropractic*. The accuracy of the indexing the four publication types from JMPT within MEDLINE was 62.98%. With 95% confidence intervals, the specificity was 82.93% (range, 73.36–89.55), sensitivity was 58.45% (range, 53.3–63.42), positive likelihood ratio was 3.423 (range, 2.108–5.56), and negative likelihood ratio was 0.501 (range, 0.428–0.586).

DISCUSSION

The aggregate poor sensitivity and negative likelihood ratios of using the MeSH terms *chiropractic* or *manipulation, chiropractic* to search the content of JMPT in MEDLINE demonstrates that these terms are not very useful in screening for papers about or by chiropractors within a chiropractic journal. One would infer then that these terms would be no better or in fact much worse at finding chiropractic literature within the complete MEDLINE data set.

CONCLUSION

A search of the MEDLINE database for papers published in JMPT using the MeSH terms *chiropractic* or *manipulation, chiropractic* proved to be ineffective in identifying appropriate chiropractic literature. Thus, the presence of the chiropractic contribution to biomedical scholarship may be hidden to those searching for that contribution. This finding reinforces the importance of developing a best practices database related to chiropractic that is available for scholars, clinicians, and policymakers and is easy to search.



Effects of Changes in Radiology Laboratory Teaching on the Use of Directed Learning Exercises and Study Approaches

A Comparison Between 1st- and 2nd-Year Cohorts

Cynthia Peterson, R.N., D.C., D.A.C.B.R., M.Med.Ed., F.C.C.R.(C), Canadian Memorial Chiropractic College

Radiology self-assessments, as a form of directed learning, were created at Canadian Memorial Chiropractic College to address a need for reducing faculty overload without negatively impacting student learning. However, the creation of these self-assessment exercises was not intended to serve as a substitute for studying from the collection of radiology teaching files housed in the radiology lab. Increased enrollment at the Canadian Memorial Chiropractic College required that changes be made in lab group teaching methods. The self-assessment exercises had lab time allocated for completion for 4 years, but now needed to be done outside of class time. This study was designed to explore how these changes influenced the student's use of and perceptions of the self-assessment exercises, as well as to compare the study approaches between the 1st- and 2nd-year students.

METHODS

A short questionnaire was designed containing three items and administered as part of the final examination for 1st- and 2nd-year students. The questions address the frequency of completion and perceived usefulness of the self-assessments, as well as the ranking of usefulness of five different study tools/aids for radiology. The mean scores and standard deviations were calculated for all components of the three questions for 1st- and 2nd-year students separately. The rankings of usefulness of the various study aids/methods for radiology were evaluated by comparing the mean score for each of the five items separately for the 1st- and 2nd-year students. These scores were then compared for differences between the two student cohorts using the Mann-Whitney U test (nonparametric *t*-test). Spearman's correlation coefficient was calculated to compare frequency of using the self-assessments, rated usefulness of self-assessments, and use of the other study aids/methods with the final course grades.

RESULTS

One hundred percent of the 2nd-year students and 97% of the 1st-year students completed the questionnaire. The mean final grade for 2nd-year students was 79% and the mean final grade for 1st-year students was 77%. Both student cohorts rated the frequency of completing the self-assessments as well as the usefulness of the self-assessments very high. On the 5-point Likert scale, with a score of 5 indicating completion between 81% and 100% of the time and a score of 4 meaning completion between 61% and 80% of the time, the 1st-year students scored 4.27 and the 2nd-year students scored 4.21. The two cohorts obtained identical scores of 4.28 for the usefulness of the self-assessments (5 = extremely useful). Statistically significant differences were noted between the 1st- and 2nd-year students in four of the five study aids. Significant differences were noted for rating the usefulness of the textbooks, note service, radiology teaching files, and self-assessment exercises. The only area of agreement between the two groups was for use of Internet sites. There were no statistically significant correlations between final course grade and the rating of any component on the 2nd-year questionnaires. However, Spearman's correlation coefficient found a weak, but statistically significant correlation comparing the frequency of completing the self-assessments with the final grade for the 1st-year cohort.

DISCUSSION

Although both 1st- and 2nd-year students rated the frequency of completion and usefulness of the self-assessment exercises as very high, there were significant differences in the ways in which the two cohorts approached their radiology studies, with the 2nd-year students using the more appropriate learning methods.



Comparison of Mechanical Force, Manually Assisted Activator Manipulation Versus Manual Side-Posture, High-Velocity, Low-Amplitude Manipulation in Patients With Low Back Pain A Randomized Pilot Study

Mark T. Pfefer, R.N., M.S., D.C., **Stephan R. Cooper**, D.C., Cleveland Chiropractic College, Kansas City, and **J. Michael Menke**, M.A., D.C., University of Arizona

Back pain is extremely common and is second only to the common cold in eliciting visits to health care professionals. Estimated costs associated with back pain, both direct and indirect, range from \$8 billion to \$18 billion annually. These factors have led to a variety of therapies that run the gamut from traditional to alternative, conservative to extreme. Spinal manipulative therapy (SMT) is a very common intervention for these conditions and has demonstrated efficacy comparable or superior to many other treatments regularly used for back pain. Spinal manipulation also fares well when compared with physical therapy, nonmanipulative treatment administered by a general practitioner, and orthopedic surgery. Within the chiropractic profession, however, SMT involves many techniques and methods, some of which have never been tested for efficacy or compared with any other tested manipulative technique.

METHODS

This study was reviewed and approved by the Institutional Review Board of Cleveland Chiropractic College, Kansas City. A randomly assigned, two-group design (Activator instrument mechanical force, manually assisted manipulation versus diversified manipulation) of acute and subacute adult low back pain patients was conducted, with patients receiving up to 6 weeks of care. Patients were recruited with complaints of constant or intermittent low back pain that had not lasted more than 16 weeks and patients were required to have a minimum score of 2 cm on a 10-cm visual analog pain scale. Patients in the instrument adjusting group were assessed by means of the Activator Methods Chiropractic Technique (AMCT) “basic and advanced” protocol, and decisions about when and where to adjust were based on these findings, at the discretion of the treating doctor. Patients in the diversified intervention group were evaluated by palpation and radiographic analysis, at the discretion of the treating doctor. Each subject’s overall perception of pain was assessed with a 10-cm horizontal visual analog scale and functional

clinical assessment was evaluated using the revised Oswestry questionnaire.

RESULTS

Forty-two subjects met entrance criteria and were enrolled (21 in each group) in the study during an 18-month period. No adverse events were reported within either group. Three patients dropped out of the study, one in the Activator group and two in the diversified group. Patients were highly satisfied in both treatment groups, although patients in the Activator group rated their treatment as more comfortable than the diversified group. Mean number of treatments was slightly lower in the Activator group compared with the diversified group, but there were no statistically significant differences between groups in end-point outcomes using a *t*-test.

DISCUSSION

The effects of using a mechanical force, manually assisted Activator instrument with the AMCT protocol appear to be similar to those with diversified adjustments in patients with acute or subacute low back pain. Comparison of two treatment groups and lack of a control group limit this study and preclude the ability to discern the contribution of treatments versus the natural history of low back pain. Each of these treatment techniques also has its corresponding system of analysis, and the contribution of the respective analysis methods to treatment outcomes (contribution to clinical knowledge) versus treatment method (efficacy) was not determined here, but is recommended for future study. Insofar as the AMCT analysis is integral to the treatment, the contribution of clinical effectiveness due to technique will not be distinguished from the contribution from the analysis. Also, effectiveness or clinical utility of the analysis individually must remain for future investigation.



Innovative Roles for Chiropractors in the Hospital Setting

Mark T. Pfefer, R.N., M.S., D.C., Cleveland Chiropractic College, Kansas City, **Lisa Terre**, Ph.D., University of Missouri, Kansas City, and **Gary Globe**, Ph.D., M.B.A., D.C., Cleveland Chiropractic College, Los Angeles

There is increased awareness and utilization of complementary and alternative care, with chiropractic care among the most utilized and developed. As chiropractors gain acceptance as part of the mainstream health care team and continue to strive to provide more primary care, it becomes increasingly important to consider innovative settings and collaborative partnerships with other providers. Interdisciplinary practice and collaboration has not been entirely open to chiropractors in the past.

This paper describes a novel collaborative partnership between Cleveland Chiropractic College, Kansas City and a large suburban medical center with the full complement of inpatient, outpatient, and outreach services. The purpose of this collaboration is to provide student training and experience in a multidisciplinary setting and to provide needed care to both inpatients and community outpatients. The paper focuses on the conceptual underpinnings of the partnership, discusses relevant issues to clinic start-up that may serve to inform similar efforts by other chiropractors and chiropractic colleges, and addresses the implications of this partnership for curriculum development and training chiropractors for innovative practice in the 21st century.

METHODS

The Cleveland Chiropractic College Wellness Center was established in 2004 as a specialty clinic on the first floor of a large suburban medical center. The clinic's primary mission was to provide chiropractic care, foster interdisciplinary collaboration, and enhance student learning in an interdisciplinary context. Against the broader backdrop of a medical center providing a broad range of acute inpatient (including long-term care) and outpatient specialty clinic care, the chiropractic clinic provides care to people from the community, as well as in-patients, long-term care patients, and hospital staff and employees. One unique feature of the chiropractic specialty clinic is that space is leased from

the hospital and independently managed by the chiropractic college.

RESULTS

After 1 year the Cleveland Chiropractic Wellness Center is operating well in this interdisciplinary community setting. Consistent with broader literature on diffusion of innovation, physician referral patterns to the new wellness center allowed the identification of medical staff physicians who were "early adopters" of this innovative service. Most commonly treated conditions in this clinic are back pain and a variety of headaches, although there are an increasing number of referrals of patients with chronic pain syndromes. There have been no adverse events or significant side effects reported associated with chiropractic care delivery to patients since the inception of this specialty clinic. On exit interviews students consistently rate their participation in this program as quite satisfying and feel that this program is an excellent learning experience.

DISCUSSION

With appropriate planning, training, and sensitivity, chiropractors can integrate their services into more traditional venues. Challenges include the need to interact more with and educate staff physicians about chiropractic care approaches including current research, indications, contraindications, risks, and "best practices" approaches. Another challenge is the need to expand the research component of this clinic such as increasing presentation and publication of interesting or unusual case studies. Future research is planned to survey medical staff physicians, nurses, and staff about their attitudes and knowledge regarding the chiropractic specialty clinic.



The Delivery of a Web-Based Clinical Psychology Course in a Chiropractic Curriculum

Julie A. Plezbert, D.C., D.N.B.H.E., New York Chiropractic College

Clinical psychology is a required core curriculum course in the doctor of chiropractic degree program, mandated by the Council on Chiropractic Education. As a clinical science it is appropriately offered in the 2nd through 4th year of most chiropractic educational programs when students are engaged in some stage of clinical training. Although the biopsychosocial model has been well documented as the ideal approach to patient care, it can be difficult to impress upon students the importance of addressing the broad spectrum of psychosocial problems commonly seen in practice and to provide practical clinically relevant management solutions. The task of designing a meaningful course utilizing the Internet that would promote an appreciation for the psychosocial aspects of patient care without a lead instructor's physical presence was challenging. However, it appears to have been quite successful in terms of student satisfaction with content and delivery.

The objective of this presentation is to share a Web-based clinical psychology course design that has been successfully delivered for three trimesters. Course implementation, syllabus, Web sites, resources, and suggested assessment tools will be presented with the goal of enhancing the core education of chiropractors by collegiate sharing of ideas, information, and personal experience.

METHODS

Student surveys assessing content, quality, and satisfaction with the course were utilized with results completed for three trimesters. Specific resources in terms of choice of textbook and Internet sites were also assessed.

RESULTS

Greater than 50% of students each trimester responded to the surveys and positively about the course content and

method of instruction. Students also made a significant number of consistent personal comments about the positive and negative experiences of this course design, particularly in the context of the value of clinical psychology to clinical practice. The resources utilized and using an interactive discussion board as a required task were the most meaningful experiences reported by the students.

DISCUSSION

The mental and emotional aspects of a patient's experience of illness are of utmost importance in a biopsychosocial paradigm approach to patient care. It is congruent with the patient as a person or patient-centered paradigm approach to health care. Clinical psychology is one defined curriculum course that should address social, mental, and emotional issues specifically addressing this paradigm. It would seem that a personal or in-person classroom approach would be more conducive to teaching the importance of clinical psychology to chiropractic interns simply by instructor presence and ability to respond to students directly in a classroom setting. However, preliminary evidence and experience suggest that it is possible to deliver an entirely Web-based clinical psychology course that imparts factual information and a biopsychosocial appreciation for the value of clinical psychology in practice.

CONCLUSION

Clinical psychology and its importance to patient care can be taught successfully in the core chiropractic curriculum utilizing an entirely Web-based course design. Student satisfaction for both core content and clinically relevant appreciation and application of course materials is not compromised by this method of course delivery.



The Implementation of a Geriatric Elective Course in the Chiropractic Curriculum

Preparing for a Unique Specialty in Chiropractic

Julie A. Plezbert, D.C., D.N.B.H.E., New York Chiropractic College

It has become common knowledge in the medical academic/educational community that addressing the special health care needs and concerns of an aging population is of paramount importance. The population of people 65 years or older is expected to double within the next 2 decades with gross estimates that approximately 13% of the population is currently at or over the age of 65. The objective of this paper is to describe the design and implementation of an elective course in geriatrics that complements and provides more substantial hours of education in preparation for advanced study and clinical rounds in an integrative, multidisciplinary setting.

METHODS

A college curriculum committee approved a proposal for the addition of an elective in geriatrics. Prior to submission for review and acceptance, the elective course proposal with detailed topic lists was initially reviewed by chiropractic clinical science department members for feedback and general approval for submission to the curriculum committee. A contrast was made between the core curriculum topics and total hours and how the elective could offer more detailed information to address specific geriatric concerns preparing students for advanced training in a clinical milieu available in our college system.

DISCUSSION

It is estimated that 13–14% of the current U.S. population is in the geriatric age range at this time. The baby-boomer

generation is largely responsible for the expected increase beyond this number in the next decade. It is important that the study of geriatric medicine is included not only in the core curriculum for chiropractors but also in other courses which are currently limited. An elective course is a good beginning to remedy the deficit in clinical education about this important population and provides a substantial prerequisite for advanced clinical training. Chiropractic interns in a some of our colleges already have access to substantial numbers of geriatric patients and in some cases are already engaged in multidisciplinary centers that provide care to this group. It could only be a positive outcome to provide students with advanced knowledge of geriatric health concerns with the goal that they would be better prepared for a specialty focus by taking this elective course. It is planned that an advanced geriatrics clinical practicum will be realized in the near future to create a viable internship or fellowship experience where students are adequately prepared to engage in the application of principles and practice of geriatric medicine as chiropractic specialists in the field of gerontology. Clinical faculty with expertise in the care and management of geriatric patients already exist at this college clinic system and possibly in other colleges as well. This elective didactic course should serve to prepare students to develop and eventually practice skills in geriatric patient assessment and treatment in a clinical setting. The possibility of creating a premier chiropractic geriatric specialty within our core curriculum is exciting and it will encourage practicing doctors of chiropractic to consider this specialty.



Radiographic Findings That May Alter Treatment Identified on Radiographs of Patients Receiving Chiropractic Care in a Teaching Clinic

Michael Pryor, M.B.A., D.C., and **Matthew McCoy**, D.C., Life University

Chiropractors routinely expose patients to ionizing radiation for a variety of purposes. These include: to determine the existence of pathology and anomalies, to determine

contraindications to the application of forces into the spine, to determine of the extent of misalignment, to determine specific vectors to be applied in correction of subluxation,

and to further assess a region when faced with “red flags.” There has been some effort within the chiropractic profession to address X-ray utilization rates and needs. There is some contention within the profession regarding the extent of restrictions on the use of X-ray and whether or not such restrictions are in the best interest of the patient. Since chiropractors routinely apply forces to the spine, these forces have potentially adverse effects if a given pathology, abnormality, or anomaly was present and unknown to the practitioner. Further, chiropractors purporting to make structural corrections often justify the taking of radiographs to determine a vector in order to apply their particular technique. This article reports on the data gathered from a review of radiographs taken in the outpatient teaching clinic of a North American chiropractic college.

METHODS

Five hundred patient files were chosen through a random search of a computerized, patient case management database in a chiropractic college teaching clinic for the period 1999 through 2004. These files were analyzed for the presence of pathologies, abnormalities, and anomalies that might alter the management of the patient.

RESULTS

Of the 500 files reviewed, 413 patients had X-rays of the cervical spine taken, 403 had thoracic spine X-rays taken, 402 had lumbar spine films taken, and 390 had all three areas radiographed. Seventy-seven patients had no X-rays

taken. Pathologies, abnormalities, and anomalies that might alter the management of the patient were found in 91% of cervical spine radiographs, 70% X-rays of the thoracic spine, and 79% of X-rays of the lumbar spine. Of the 500 files reviewed, the ages ranged from 1 to 86 years with a mean age of 35.6 ± 15.6 . There were 242 males and 258 females.

The 10 most frequent anomalies in descending order were cervical hypolordosis, lumbar scoliosis, pelvic and sacral unleveling, cervical listing, decreased disc height (cervical spine), anterior lipping and spurring (cervical spine), anterior lipping and spurring (lumbar spine), kyphotic cervical curve, anterior lipping and spurring (thoracic spine), and decreased disc height (lumbar spine).

DISCUSSION

It is questionable whether or not the existence of anomalies and/or abnormalities such as those identified in this study should or do affect the management of the patient and, if so, under what circumstances. There are some studies demonstrating utilization of radiographs to characterize the biomechanical manifestations of vertebral subluxation. These include studies that demonstrate changes in atlas position following chiropractic adjustments and studies that demonstrate changes in the lateral cervical curvature as a result of chiropractic care. A large percentage of patients in this study had pathologies, abnormalities, and/or anomalies that might alter the management of the patient. Further research and analysis is necessary to determine whether the existence of these abnormalities/anomalies actually alters the course of care and whether or not biomechanical changes occurring as a result of chiropractic care are clinically meaningful.



The Effect of Body Position on Verticality Perception Using the Rod and Frame Test

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Because we live in an age of evidence-based practice, it is important that clinicians utilize valid, reliable, and responsive outcome measures to assess patients. Proprioceptive dysfunction may be one of the most important factors in understanding morbidity of neck pain. No instruments are currently available to evaluate the somatosensory system of the neck and proprioception in the routine practice setting. The rod and frame test has been used to assess patients' subjective perception of verticality and has demonstrated increased error in verticality perception in those suffering from neck pain. This increase may be due to changes in

cervical spine proprioceptive abilities, and the rod and frame test may be useful for measuring some of the symptoms other than pain that are experienced by those with cervical injury.

The long-term objective is to develop and psychosomatically test a new outcome measure for evaluating proprioceptive cervical spine dysfunction using the rod and frame test. The specific aim of the present study is to investigate the effect of body position on the verticality perception of asymptomatic and symptomatic neck pain subjects using the rod and frame test.

METHODS

This study was reviewed and approved by the Institutional Review Board of the Canadian Memorial Chiropractic College. Seventeen symptomatic neck pain participants (12 women, 5 men), aged 24–50 years and 17 age- and gender-matched control participants were selected. The rod and frame test requires participants to set, with the use of a remote control, a luminescent rod to the vertical position with or without a frame visible in complete darkness. Participants set the rod to vertical while in three different body positions: (1) standing with feet shoulder width apart, (2) standing heel-to-toe, and (3) sitting on a gym ball. In each position, participants are evaluated with three different tests: (1) the rod visible at 10° clockwise from vertical, (2) the rod visible at 10° clockwise from vertical with a neutral frame visible, and (3) the rod was set at 10° clockwise from vertical with a frame set at 15° clockwise from vertical. Error from true vertical was measured with a protractor located on the back of the rod and frame test. Independent *t*-tests were used to determine the correlations between body position and verticality perception between the neck pain and control groups

as well as the relationships in verticality perception errors within and between the two groups.

RESULTS

Independent *t*-tests did not show statistical significance for the effect of body position on verticality perception. A trend suggests verticality perception errors in the symptomatic participants were greater than in controls, but this difference did not achieve statistical significance.

DISCUSSION

The results of this study indicate that body position does not affect verticality perception when measured with the rod and frame test in individuals with neck pain. Subsequent studies with larger sample size and a more defined neck pain population may be warranted.



Effective Determination of a Seriously Ill Child Using an Observation Scale A Case Study

Drew Rubin, D.C., Life University

The practice of chiropractic is evolving into a primary care, portal of entry role. The chiropractor is often seen filling the role of “family doctor,” and patients may present first to the chiropractor because patients feel that chiropractors are adept at triage, and patients are comfortable and secure in chiropractic offices. This has occurred chiefly because chiropractors tend to see their patients more often than their traditional medical counterparts, and hence develop a baseline or normal, which can readily be compared to an abnormal presentation. In clinical assessment and documentation, it is common to use standard measures that have been found reliable and valid. Pain scales and disability surveys are becoming basic tools for clinical decision making. Increasingly, the presenting pediatric case problems are not musculoskeletal conditions, so a criterion may help chiropractors gauge whether referral is necessary for young patients. A scale that determines by observation the severity of a child’s presenting condition may be useful to chiropractors. The purpose of this paper is to present a case study of a seriously ill child and identify how observation scales helped guide the decision-making process.

CLINICAL FEATURES

This is a case study of an acutely ill 2-month-old male in a private chiropractic practice. The infant presented to this office in an acute febrile crisis that had come on suddenly within the course of the day and seemed to the parent to be rapidly progressing. The child also had diarrhea that had started shortly before the office visit. The two main questions one has to ask whenever there is fever of unknown origin in an infant are: Is the child seriously ill and is the cause meningitis?

ASSESSMENT

Through the examination of six items on an observation scale, it was possible to determine whether there was a need for immediate referral versus adopting a “wait-and-see” attitude by giving the child an observation scale grade. Through use of the observational scale it was determined

that although this was a moderately ill child, it was neither a serious illness nor meningitis.

DISCUSSION

Chiropractors need to be able to recognize emergency situations involving young children with fevers that require

medical comanagement. The observational scale can help chiropractors be prepared to make a clinically important assessment as to whether a patient is seriously ill and requires comanagement. The practitioner and the student will find that this measurement tool can build their confidence and effectiveness as primary care clinicians. The observation scale can be of tremendous benefit in the family chiropractor's day-to-day decision-making processes.



The Development and Implementation of a Student Success Center Within the University Setting

Lisa Rubin, Ph.D., and **Sue Dudt**, M.A., Life University

The Student Success Center (SSC) was developed out of a need to assist students through academic, emotional, disability, career, and leadership support. The center was modeled after a session at a Noel Levitz conference. The SSC was created to remove the old stigma of academic assistance being focused on remediation and failing/troubled students. The SSC hopes to help the whole person by integrating multiple support services. The purpose of the Center is to help prepare students for a positive experience at this institution and for continued success after graduation.

METHODS

The SSC has allowed for multiple departments to be housed under one umbrella in order to better support the student population. There are five components identified for student success: academic assistance (tutoring, supplemental instruction, study skills, make-up testing); personal counseling (individual, group, couples, and family); disability services (accommodations according to the Americans with Disabilities Act); career planning and placement (in conjunction with student life and Web site job listings); and leadership and success (workshop series). This allows the SCC to assist students for various needs in one location. It has also permitted us to increase communication with the Dean's Office, faculty, and administration regarding student's progress so we can continually work together for the benefit of the student.

RESULTS

Participation in supplemental instruction has increased from 163 students in Spring 2004 to 836 students in

Spring 2005. This increase reflects the SSC's commitment to exposing services to all students with all abilities. The same increase has been seen in tutoring, increasing from 125 students in Spring 2004 to 464 students in Spring 2005. There has been an increase in the number of participants for counseling and disability services appropriately according to our increase in population. We also have tracked the pass rates of students who participate and those who do not participate in supplemental instruction and tutoring to make sure these services are beneficial. According to statistics from Fall and Spring 2004, 60–100% pass using these support services. Student evaluation surveys are continuously being assessed to identify whether students have shown improvement and whether the services are meeting their needs (i.e., improved overall study habits and grade point average, disability accommodations are fair and reasonable, students in counseling feel improved coping skills and more at ease and calm).

DISCUSSION

The SCC provides students with a learning opportunity that develops competencies that enrich the individual's educational experience and assists them to achieve excellence. Other major universities around the country are beginning to utilize this model. One example is Central Michigan University, which has realized a 33% drop in students placed on probation with an increase in retention rate from 69% to 74% in the last 3 years. Other universities that have also adopted a student success center model are University of Wisconsin, Milwaukee; University of Colorado; University of North Carolina, Greensboro; University of Missouri, Columbia; and James Madison University. No other chiropractic school is currently known to

have brought all five components of student support services together. The SSC has only been in existence for 1 year. We continue to grow and learn as we pursue our goal of

helping students with free support services that improve their academics and enrich their experience as future chiropractors.



A Comparison of Performance at Different Levels of Examinations in a Chiropractic College Program

Brent S. Russell, D.C., Life University

The objectively structured clinical examination (OSCE) testing format was first described in 1975, with the intent of standardizing the testing of clinical competence and minimize the biases of traditional evaluation methods. Although a number of educators and researchers have commented on the use of OSCE testing in health care education, there have not been many published accounts of the use of OSCE testing with chiropractic students.

The purpose of this project was to look for a correlation in students' examination scores at four different levels within Life University's chiropractic program: the 6th-quarter Clinic Proficiency midterm exam (CP-M), the 7th-quarter Entrance Proficiency "integrated" lab exam (EP-I), the 8th-quarter OSCE (OSCE-8), and the 11th-quarter OSCE (OSCE-11). The hypothesis was that there would be a positive correlation between scores at different levels; that is, students who scored well at the earlier levels will also have scored well on their more recent tests. Neither this correlation, nor the usefulness of these tests as predictors of future performance, had ever been examined.

METHODS

This is a descriptive, nonexperimental study, involving a retrospective analysis of students' scores. Seventy-five chiropractic students were identified who took all four examinations between the fall of 2001 and the winter of 2005. This time period was chosen because of test format consistency and availability of scores. A correlation coefficient (Pearson r) was calculated for each set of test scores compared to each other.

RESULTS

The strongest correlation found was between the CP-M and OSCE-11 tests (0.524); the weakest was between the

EP-I and OSCE-8 tests (0.260). The correlation between the OSCE-11 and OSCE-8 tests was 0.472. For $n = 75$, all values were statistically significant ($p < .05$).

DISCUSSION

The correlations between test scores at different levels range from moderate (CP-M and OSCE-11) to very weak (EP-I and OSCE-8). None of the correlations are strong enough for scores at one level to be used as predictors for another level. Other authors have also reported low correlation between OSCE testing and other types of evaluations. However, the tests in this study have significant commonality, because they cover the same subject matter (though tested at different levels); some faculty members have been involved at all four levels; and the testing formats share many similarities. For these reasons the correlation should be higher than what this study has found. The OSCE testing system was still a new program at Life University during much of the period of time captured in this study, and a number of refinements have since been made. Also, the proficiency classes have been reorganized to span two quarters and mark the beginning of the clinical education track classes in the DC curriculum. The intent of the clinical education track is to improve consistency and logical progression of teaching in a number of classes related by their emphasis on patient diagnosis and management. Although the correlations between test scores at the different levels described above were not high, the institution now has at least one way to evaluate recent changes to the curriculum. A number of steps have been taken to improve students' understanding and skills, as well as to improve the conditions in which they are evaluated. A study similar to this one conducted following the winter 2007 OSCE-11 would be able to evaluate the effects of the restructuring.



Ethical Attitudes of Senior Chiropractic Students

Marc P. Schneider, D.C., Life University

A survey process was undertaken to evaluate the ethical attitudes of senior chiropractic students. Over a period of two academic quarters, data were obtained concerning student attitudes before and after 10 hours of instruction relating to two national association codes of ethics and state rules and regulations governing the practice of chiropractic.

METHODS

At the first meeting of a course titled "Ethics and Professional Relations," a survey was administered to develop baseline attitudes toward ethics. The survey was administered a second time following completion of the presentations on the two national association's codes of ethics and the rules and regulations governing the practice of chiropractic. Each question was scored on a Likert scale from 1 to 5 with 1 indicating "strongly disagree" and 5 indicating "strongly agree."

RESULTS

A total of 112 senior chiropractic students completed both surveys. Initially, 93% of students agreed or strongly agreed that ethics were important in today's society, with 94% in this category at follow-up. In response to a question regarding the importance of chiropractors to abide by a code of ethics,

98% initially agreed or strongly agreed and at follow-up 97% agreed or strongly agreed. Upon initial questioning, 43% agreed or strongly agreed that the university rewards students with ethical standards, and at follow-up only 27% agreed or strongly agreed. Initially, 74% of students agreed or strongly agreed that there is a link between success and personal ethics, which increased to 77% at follow-up. On initial evaluation, 59% agreed or strongly agreed that in order to be successful one must abide by the law, increasing to 61% at follow-up.

DISCUSSION

As evidenced by the data collected, senior chiropractic students consider ethical standards to be important for society, as well as for chiropractors. However, a number of students surveyed did not link personal ethics with success. A disconcerting number of chiropractic students did not believe that one must abide by the law to be successful. Further, a majority of these chiropractic students did not feel that the university rewarded students who exhibited ethical behavior. Further analysis of the data as well as determining the definition of success may lead to a clearer understanding of the incongruence of these students' beliefs and behaviors. It is recommended that the university further explore students' attitudes regarding the law, success, and ethical behavior.



A Retrospective Analysis of Patient Files Following the Implementation of a Quality Assurance Program in a Chiropractic Teaching Clinic

Marc P. Schneider, D.C., Life University

A quality assurance program was implemented that utilized the policies and procedures of the clinic system and commonly accepted practice guidelines within the chiropractic profession.

METHODS

During the spring of 2003, 38 random patient files were selected. Each file was reviewed by a single reviewer for content, accuracy, and compliance to practice guidelines.

The individual items reviewed were the patient entrance data form, history, examination, radiography request form, diagnostic impression worksheet, narrative, problem management list, SOAP documentation, patient care errors, documentation errors, and intern remediation necessary.

RESULTS

Incomplete patient entrance data forms were found in 49% of files. Patient histories were either incomplete or inadequate

in 94% of files. Examinations performed were either incomplete or inadequate in 23%. Positive examination findings were not verified by clinic faculty in 37%. Diagnostic impression worksheets were either inadequate or incomplete in 84%. Patient narratives were inadequate in 39%. Problem management lists were inadequate in 50%. Daily SOAP documentation was inadequate in 61%. Patient care errors were identified in 21% of files. Significant documentation errors were found in 66%.

DISCUSSION

In general this retrospective review demonstrated a lack of appreciation for acquiring complete information. The

data also evidenced a lack of follow-up by the supervising faculty when positive examination findings were recorded by the student intern. Taken together, the incomplete and inadequate information and lack of follow-up may have led to patient care errors. As a result of the file reviews, 68% of student interns involved in the care of these patients were referred for remediation. Clinic faculty involved were referred to their respective clinic directors. It is the opinion of the author that this process is integral in developing and maintaining a means of improving the quality of patient care and the documentation of patient files.



A Comparison of Direct Assessment Techniques of Basic Science Knowledge at a Chiropractic College

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In every academic program, evaluation of student learning is of quintessential importance. Assessment techniques in the didactic setting most frequently involve quantitative measurements using test items created locally by faculty. Common test item formats are essay, multiple-choice, true/false, matching, or completion. It is assumed that test items that simply require recognition of information presented are not as powerful at assessing deeper levels of processing when compared with test items that require recall of information presented. Two commonly used test items used to test recognition and recall, respectively, are multiple-choice questions and completion test items. The purpose of this study was to compare outcome levels attained when administered a multiple-choice and completion examination in which the information tested was identical.

METHODS

The study was carried out in a classroom of 35 students enrolled in a capstone course in pathology at a chiropractic college. Students were provided with a complete list of course goals and objectives prior to the examination. The examination was administered approximately two-thirds of the way through the course. Students were informed that, within a single testing session, they would be required to take two 15-question exams and that the test items would be of the multiple-choice and completion

format. They were not provided with any other additional information regarding the exam process. Two examinations were formulated by the instructor, with one examination in multiple choice format and the other having identical content but in completion format. All test items were designed to have only one correct response. An example of test items follows:

Completion test item:

The nonneoplastic aging disorder of bone characterized by an overall decrease of bone mass which may present with pathologic bone fractures is termed _____.

Multiple-choice test item:

Which of the following is a nonneoplastic aging disorder of bone characterized by an overall decreased bone mass giving rise to pathologic fractures?

- osteopetrosis
- osteoarthritis
- osteoporosis
- achondroplasia

The students were initially administered the examination in completion format, followed immediately by the examination in multiple-choice format. There were no time constraints on completion of either format, and students were not allowed to review their completion exam while taking the multiple-choice exam. Data obtained were statistically analyzed using a standard paired *t*-test and values expressed as mean + SEM.

RESULTS

Student achievement was significantly higher on the multiple-choice format than on the completion format ($11 + 0.38$ vs. $6.4 + 0.53$; $p < .01$).

DISCUSSION

The multiple-choice format has been widely used because it can test many concepts in a short period of time, anticipated test answers are generally relatively nonsubjective with regard to scoring, and outcomes can be obtained rapidly and through automation. However, writing high-quality multiple-choice questions is arduous and there may be too much

emphasis placed on memorization and recognition of facts. In contrast, test items that require a written answer may avoid giving students credit for guessing and may be a more appropriate choice for assessing learning at a deeper level. Potential drawbacks to the use of completion items include subjectivity with regard to scoring and more labor-intensive scoring.

The results of this study indicate that the students' ability to recognize a learned concept was superior to their ability to recall that same concept. An argument might be made that the student's studying style may have been influenced by the anticipation of being administered a multiple-choice test (the standard test format formerly used in that course). However, students were given ample notification of the test structure well in advance of the exam and failed to perform successfully on the completion portion of the exam.



Lessons in Conducting a Survey on Student and Faculty Satisfaction With Academic Programs

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The primary mission of most academic institutions is to achieve excellence in the scholarly activities of teaching and applying knowledge in their respective disciplines. There is a continuous challenge to assess the academic programs and to achieve academic excellence in light of the ever-changing demands of the students and faculty. Every university has established processes to develop and review academic programs. However, developing methods to periodically test these processes for their utility in addressing the changing needs of health professions training is critical before considering curricular changes. This paper describes the preliminary steps in developing and testing a review process proposed by the Instructional Programs Committee of the Southern California University of Health Sciences to evaluate its academic programs. The objective of this process was to provide evidence of the utility of an assessment method and, during the process, to identify barriers in such a measurement.

METHODS

A subcommittee of the Instructional Programs Committee, composed of faculty and students, developed and administered a single question survey to gather the opinions of students and faculty regarding their satisfaction with the courses in the university curriculum, not limited to syllabi or method of instruction. The University includes a College of Acupuncture and Oriental Medicine (CAOM)

and a College of Chiropractic (CC), both of which were surveyed. To protect confidentiality and avoid any influence in the responses, no personal identifying information was requested from the responders. Student class representatives administered a paper survey instrument during the 13th and 14th weeks of a 15-week trimester in spring 2005. An electronic survey was used for students who could not be reached in a classroom setting. Microsoft Excel software was used for both data entry and analysis.

RESULTS

In the CAOM, 97% of the students were surveyed and a response rate of 60% was obtained, although there could be an error due to inconsistencies in administration of the instrument. Of those responding, 84% indicated an overall "satisfaction," 10% indicated a "lack of satisfaction," and 6% did not respond. Of some 80 students in the CAOM internship programs who were polled via e-mail, only 4 responded. In the CC, 55% of students present in class on the days that the survey was administered responded, with the same possible error as noted for the CAOM survey. Seventy-five percent of those responding indicated an overall "satisfaction," 24% indicated a "lack of satisfaction," and 1% did not respond. In general, the majority of faculty responding from both colleges indicated an overall "satisfaction" with their courses.

DISCUSSION

The intent of this survey was to provide evidence of the utility of this method of program assessment and to identify barriers in using such a measurement. There is no single reason that could be attributed for the inconsistent response rates of students for different courses within the same term in both programs. The identified areas requiring

more attention in future efforts included inconsistencies in administration, manual polling versus confidential electronic polling, responder fatigue due to repetition, time and labor efficiency, and funding. It is important to determine an appropriate evaluation design which can collect information that can serve the decision-making process and also address research integrity. It is also crucial to collect such information periodically and to critically analyze the data before making decisions regarding academic restructuring.



Toftness System of Chiropractic Adjusting on Back Pain and Electromagnetic Field and Heart Rate Variability

Brian Snyder, D.C., and John Zhang, M.D., Ph.D., Logan College of Chiropractic

This project is designed to investigate the effectiveness of the Toftness system of chiropractic adjusting on subjects with back pain in the cervical, thoracic, lumbar, or sacral areas and correlate the changes in electromagnetic field (EMF) and heart rate variability (HRV) to the visual analog scale (VAS) recordings. The hypothesis is that people who receive a Toftness adjustment will experience a greater relief from their back pain and also show more significant changes in EMF and HRV in the above 5 group and in the below 5 group on the VAS than those subjects who are in the control group.

METHODS

This study was reviewed and approved by the Institutional Review Board of Logan College of Chiropractic. This randomized controlled study of 54 subjects recruited three groups of subjects suffering from low back pain using a random table. There were two experimental groups and two control groups. All experimental subjects received Toftness chiropractic adjustments and the control group did not receive adjustments. The first experimental group was subjects suffering from low to moderate back pain (1–5 on the VAS scale). The second experiment group was subjects with high moderate to severe low back pain on the VAS scale of 6–10. The control group was subjects who were also divided into low pain and high pain groups based on VAS scales, the same as in the experimental groups. Subjects in the study were recruited from the student body, faculty, and staff at a chiropractic college. HRV was measured using the BioComp device.

RESULTS

Fifty-four subjects were recruited from a chiropractic college (20 female, 16 male, 18 in the control group). The

average age of the study population was 34 ± 12 years old. There were statistically significant decreases in VAS in subjects with low back pain in both high pain and low pain groups. There were no statistically significant changes in the control groups. The EMF readings in the below 5 VAS group showed a significant increase in EMF compared with the above 5 VAS that showed a significant decrease. In the below 5 VAS group, the cervical, thoracic, lumbar, and sacral regions all showed a statistically significant increase. In the above 5 VAS group, the cervical, thoracic, lumbar, and sacral regions all showed a significant decrease. There was no statistically significant change in the control groups' EMF readings in the above and below 5 VAS. The HRV analysis in the high pain group showed a decrease in the sympathetic response and an increase in the parasympathetic response. There were no significant changes in HRV analysis in the control groups.

DISCUSSION

The data collected show promise for Toftness chiropractic adjustment for pain. This finding is comparable to studies in related areas. The significant reduction in pain before and after chiropractic care was similar to other studies that reported pain reduction after chiropractic adjustment. The decrease in the above 5 VAS group and an increase in the below 5 VAS group are very significant findings because they relate to the clinical improvement of patients. This study indicates that the Toftness system of chiropractic adjusting affects the EMF changes differently depending on the patients' pain level and also produces a positive result in HRV analysis. This is a very important clinical finding that will promote further research in this area.



A Recent History of the Organization of a Collective Bargaining Unit and Negotiation of an Initial Collective Agreement at a Private Midwestern Chiropractic College

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After a 20-year hiatus, the organization of part-time college faculty, graduate students, and full-time faculty members who are off the tenure track is again making a comeback. Several factors have led to the formation of collective bargaining at academic institutions, including the “casualization of academic labor,” the “corporatization” of academic institutions, and the erosion of faculty compensation.

The purpose of this poster is to present the events that occurred at Palmer College of Chiropractic in Davenport, Iowa which led to the formation of a collective bargaining unit (CBU) and to describe the process of negotiations that led to the adoption of the initial collective bargaining agreement (CBA) in May 2005.

METHODS

In reviewing the history of the formation of the CBU and the subsequent negotiation of its initial CBA, the authors relied on personal notes, faculty senate minutes, and correspondence, both electronic and paper. These materials were organized chronologically and a synopsis of events was compiled. All corroborating materials are available for review with the lead author. The final product of the negotiations, the initial CBA, is available on the Web site <http://www.chiro-educators.org/>, as well as in the Palmer College Library.

RESULTS

Several factors led to the formation of a CBU at Palmer College. In 1991 the formation of a university system at

Palmer College contributed to the “corporatization” of a formerly collegial and paternalistic system. Loss of long-term contracts, loss of full tuition benefits for dependents, the imposition of additional work requirements with no additional compensation, and a perceived inequity between faculty and administrative salaries also contributed to the successful organization drive. In September 2001, 86% of the faculty who voted (85% of those eligible to vote) authorized their affiliation with the American Federation of State, County, and Municipal Employees (AFSCME). After a protracted and often adversarial negotiation process, interrupted by administrative personnel changes, a CBA was ratified in May 2005. The CBA defined the faculty workload as 12 credit hours, capped salary increases at 5%, increased the pension benefit by 1%, and required a system of comprehensive annual evaluation of bargaining unit faculty performance.

DISCUSSION

Collective bargaining is no panacea for a lack of communication, mutual trust, and respect between college faculty and administration. Months and even years of focused attention to detail can be required on the part of both the bargaining unit and the college’s negotiating team to reach an agreement that will be ratified by both parties. The establishment of trust and mutual respect in a collegial environment is to be preferred over the establishment of a collective bargaining unit. When such an atmosphere is unattainable, however, the formation of a collective bargaining unit can guarantee limited rights for eligible faculty.



Partnership to Improve Pain Management of Persons in Residential Alcohol and Drug Treatment Programs

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Chiropractic College

Acute and chronic musculoskeletal pain is widespread in the substance use disorder population. The correlation between chronic pain and substance abuse is well documented. Musculoskeletal pain can motivate susceptible individuals to abuse drugs and alcohol in an effort to obtain pain relief. Pain can exacerbate substance abuse and serve as an obstacle in the rehabilitation process. Chiropractic care may provide an effective, nonpharmaceutical treatment for this patient population. However, persons who are uninsured, underinsured, indigent, and in residential rehabilitation centers often have difficulty accessing this care. In 2004, Western States Chiropractic College was awarded a grant from the Collins Foundation to provide chiropractic care to residents in three substance abuse treatment programs. The grant extends the outreach of the West Burnside Chiropractic Clinic (WBCC), one of the school's teaching clinics. Under the Collins grant, three treatment programs each host a weekly on-site clinic, staffed by a supervising chiropractor and one to two interns. This paper reports on the phase of the 3-year project.

The goals of this project were to help marginalized patients and the community by providing chiropractic treatment to improve rehabilitation outcomes for substance abuse disorders; document the outcomes of chiropractic care with a vulnerable population; provide student interns with clinical training in working with a vulnerable client population; and develop a model for similar treatment programs and community partnerships.

METHODS

The project and its evaluation were approved by the Institutional Review Board of Western States Chiropractic College and the review boards at each treatment center. Confidentiality, coordination of care, and ongoing communication were highlighted in formal agreements between the WBCC and the treatment programs. Outcome measures were designed for each of the objectives.

RESULTS

In a 3-month period, 70 residents (39 women and 31 men) received chiropractic care from five interns. The majority

reported themselves as Caucasian (73%), aged 18–56 years. Complaints included back (55%), neck (20%), or shoulder (17%) pain; many reported multiple foci. Chronic conditions were reported by 24 residents, including hepatitis, diabetes, asthma, and hypertension. Interns performed an admission assessment on each resident, devised a treatment plan, and provided the appropriate care. The admitting intern provided subsequent care, and most residents returned for more than two clinic visits. In addition to spinal manipulation and soft-tissue manipulation, care included self-care instruction regarding exercises, stretches, proper lifting, and posture. All involved with this project have reported satisfaction with the outcomes. The vast majority of residents have reported decreased pain levels following treatment, although the weekly treatments have not significantly reduced their subsequent pain ratings. In addition to valuing “real-world” experience with diverse, complex clients, interns’ comments conveyed an increased ease in working with diverse clients and surprise with residents’ motivation to incorporate self-care suggestions into daily activities.

DISCUSSION

Chiropractic’s emphasis on patient responsibility for a healthy lifestyle supports substance-abuse treatment programs’ efforts to teach self-care and problem-solving skills. Community-based partnerships are increasingly vital. Alcohol and drug treatment programs are in a state of crisis due to drastic cuts to long-standing social and health services. Cooperation between chiropractic institutions and safety-net facilities strengthens the quality and availability of treatment options to a diverse population of substance use disorder patients. In addition to fostering chiropractic knowledge and clinical decision-making skills, chiropractic professional education should impart attitudes that foster integrity and a concern for humankind. Care models are needed to prepare interns to address the needs of marginalized populations. Such training enhances the overall quality of health care provided by chiropractic physicians.



A Randomized Controlled Trial of the Effects of Instrument-Applied Cervical Manipulative Therapy on Cervical Range of Motion

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Measures of cervical range of motion have been used to evaluate a wide range of cervical spine-related conditions, with numerous assessment instruments showing good validity and reliability when properly used. Several chiropractic manipulative therapies (CMT) have been shown to increase cervical ranges of motion in symptomatic and asymptomatic populations. The current study investigated the effects of an instrument-applied manipulation, the Pro-Adjuster System, on cervical ranges of motion.

METHODS

The Logan College of Chiropractic Institutional Review Board approved this investigation. This experiment was a randomized controlled trial of the effects of the Pro-Adjuster System on cervical ranges of motion. Forty asymptomatic consenting volunteers were randomly assigned to treatment or control groups of 20 each. Treatment and control groups underwent initial assessment of cervical ranges of motion with a dual inclinometer (JTech Dualer IQ), an intervention of either the Pro-Adjuster System or a control condition, and finally a postintervention cervical range of motion assessment. Data analysis was by a series of one-tailed paired *t*-tests comparing pre- and postcervical ranges of motion measures of the treatment and control groups. Two hypotheses were tested: that the treatment group would have significant cervical ranges of motion increases, and that the control group would have no cervical ranges of motion changes.

RESULTS

The treatment group achieved statistically significant increases in all cervical ranges of motion while the controls had no cervical ranges of motion changes.

DISCUSSION

Both hypotheses were supported by data analysis. The results of this investigation offer several implications for chiropractic research and practice. Scientific, legal, and economic forces are changing chiropractic through evidence-based practice and best practices initiatives. New technology like the Pro-Adjuster System should be subjected to rigorous empirical investigation to provide educators and practitioners with information as to its clinical efficacy.

CONCLUSION

Further investigation of the Pro-Adjuster System is warranted.



The Role of Chiropractors in the Detection of Family Violence Epidemiology, Training, and Interdisciplinary Collaboration

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Family violence (including domestic/intimate partner violence, child abuse, and elder mistreatment) has been identified as a major public health concern. In addition to the associated physical and psychosocial comorbidities, considerable evidence also suggests that such abuse heightens risk for

health-detrimental behaviors, health care overutilization, and subsequent re-victimization. Although the epidemiology of family violence has been difficult to establish because of patient underreporting and data indicating that only a small minority of physicians (an estimated 15% or fewer)

regularly screen for family violence, some prevalence estimates suggest, for example, that 44.2 per 1,000 women are victimized by intimate partner assault each year and that more than 1.5 million elders are mistreated annually, with a predicted upsurge in rates as “baby boomers” age. Hence, it is likely that the caseload of most health providers includes a substantial number of patients exposed to family maltreatment.

Considering the clinical and public health implications of family violence, the present paper provides a conceptual overview on family violence, discusses the role of chiropractors in the detection of family violence, and presents some emerging educational models for developing the key competencies to recognize these problems and move to action, with an emphasis on multidisciplinary collaboration in the biopsychosocial treatment of these multifaceted problems. This is particularly relevant given that the American Chiropractic Association supports legislation mandating the reporting of family violence.

METHODS

A review of the empirical literature on family violence was conducted between the years 1995 and 2005 using PsycINFO and MEDLINE, supplemented by selected government reports, professional guidelines, and other policy papers

with a focus on issues relevant to epidemiology, training, and interdisciplinary collaboration.

DISCUSSION

Because family violence tends to escalate over time if there is no intervention, early detection is key. In spite of this fact, family violence has received very little attention in the chiropractic literature. Extrapolating from the broader research, several models of medical education have been proposed to address the critical need for assessment and early intervention that may inform chiropractic curriculum development around family violence. As chiropractors become more mainstream portal-of-entry providers and continue to strive to provide more primary care, there is a clear need to translate the didactics of family violence into the clinical setting to provide students the opportunity for mastering the basic competencies for managing these challenging problems and for inculcating skills commensurate with those of other primary care providers. Given the paucity of existing data on chiropractors’ knowledge and practices, more research is needed to provide a firm foundation to advance training and practice relevant to family violence and to evaluate their impact.



Integrating Legal, Ethical, and Practice Aspects in a Team-Based Learning Session

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Courses in jurisprudence, ethics, and practice management at the Canadian Memorial Chiropractic College (CMCC) are traditionally taught separately and by different faculty members. In general, we found that preclinical students find it difficult to apply active learning strategies, to integrate disparate course material, and to perceive the relevance of the taught material to their own future professional careers. Assisting preclinical students to better realize that certain actions or decisions they might take in practice could have serious ethical or legal implications poses challenges for faculty. In order to address this problem, we designed a team-based learning (TBL) session to integrate legal and ethical issues in chiropractic practice.

METHODS

In health profession education, educators are exploring new approaches to incorporate active learning strategies into

their lecture-based courses. At CMCC we have recently started to make use of TBL, which has recently shown great promise in medical education. Four faculty members offered our TBL session to a class of 156 students. Although the session was planned mainly for the integration of previous material covered, the students were also required to master extra reading material. For the application problem, the faculty member responsible for teaching jurisprudence to our 3rd-year students developed the scenario and questions. The scenario was a composite taken from his actual client files and embellished by the other team members to include ethical and practice issues and questions.

RESULTS

The session went well and a lot of discussion was generated both in the groups and between groups. The students felt it was of particular benefit to have faculty from different

courses present at the same time. Both qualitative and quantitative student evaluations of the session gave mainly positive results with the students enjoying the group interaction to solve “real-life” problems as well as the immediate feedback from the faculty. They indicated that they preferred learning some course material on their own in preparation for an applied session and that more emphasis should be placed on actual cases and scenarios in the teaching of ethics. All agreed that a solid foundation in some aspects of law is important for successful clinical practice.

DISCUSSION

The positive outcome of this session has led to a number of other faculty members expressing interest in including TBL in their courses. The positive responses from the students have also led to commitment from the CMCC administration to improve the acoustics and seating arrangement of the venue by the start of the next academic year.



Climate Studies How Do Our 1st-Year Students Experience Their Educational Environment?

Hettie Till, M.Sc., M.Med.Ed., D.Ed., Canadian Memorial Chiropractic College

The curriculum is a living entity that generates and establishes educational environments, and how students, or faculty, experience their educational environment can be called climate. As climate strongly affects student achievement, satisfaction, and success, it is important to assess the climate of the institution on a regular basis in order to nurture areas of excellence and improve areas needing attention. Of particular concern to us was the question of how our 1st-year students experienced the educational environment at the Canadian Memorial Chiropractic College (CMCC). This study was designed to measure the perception of climate of our 1st-year students in order to determine what they were expecting the educational climate to be, to measure the dissonance between what they expected to experience and what they were actually experiencing, and to ascertain whether this student feedback could provide information that could be used for institutional planning and resource utilization.

METHODS

The Dundee Ready Education Environment Measure (DREEM) Inventory was used in this study. The DREEM is a validated inventory that has been used in various countries around the world to assess the educational climate of health professional schools. The DREEM has 50 items scored on a Likert scale between 0 and 4 and measures student perception within five domains, including learning, teachers, academic self-perceptions, atmosphere, and social self-perceptions. The DREEM was administered to the 1st-year students during orientation week. At that time they were requested to complete the inventory with respect to

their expectations of the educational environment (Expected mode). They were again surveyed 6 months later regarding their actual experience of the educational environment (Actual mode). Differences between Expected and Actual responses were calculated and used to generate a list of student concerns.

RESULTS

Two cohorts of students participated in the study with a total of 239 students completing the inventory in the Expected mode and 257 in the Actual mode. Statistically significant differences were found between the Expected and Actual responses and dissonance was obtained by subtracting the Actual values from the Expected values. Ranking of the dissonance from largest to smallest dissonance showed remarkable similarities between the two cohorts. Analysis of the results indicated nine common items with a large dissonance between what the students expected the educational environment to be like and what they actually experienced. A closer look at the items with large dissonance indicated, for example, that the timetable was perceived to be a problem, and that the students were stressed and too tired to enjoy the program. They also indicated problems regarding teaching, which was perceived as not always being stimulating or student-centered enough. In addition, the time allocated for teaching was seen as not always being put to good use and they had problems seeing the relevance of some of the material. They indicated that they would like more feedback from the lecturers and that long-term learning should be emphasized more.

CONCLUSION

Based on the clear message from our 1st-year students, it was possible to use the items identified as a basis from

which to develop both short-term and long-term strategic plans in order to enhance the educational climate for our students.



Discopathy With Leg Pain A Randomized Controlled Trial of Orthotrac Vest Unloading Versus EZ Brace: 1-Year Outcomes

John J. Triano, D.C., Ph.D., F.C.C.S., Canadian Memorial Chiropractic College and
Texas Back Institute

Patients with discopathy have leg pain due to compression or chemical neuritis. Axial load causes reduction in the canal cross section. A load of 25–50% body weight longer than 5 minutes reduces the area to $<100 \text{ mm}^2$. A method that reduces axial load while weightbearing may provide symptomatic relief.

This study evaluated the results after 1 year of use of the Orthotrac pneumatic vest (OPV) vs. EZ form brace as an additional therapy in patients with discopathy and leg pain. The hypothesis was that the OPV would result in greater pain relief and increased self-reported functionality than the EZ. The study was done as a prospective randomized clinical trial with follow-up at 6, 12, 26, and 52 weeks and was reviewed and approved by the Institutional Review Board at Presbyterian Hospital in Dallas, Texas.

PATIENT SAMPLE

Patients (93) with back pain failing 4 weeks of conservative care, confirmed discopathy, and radiating leg pain were solicited. Inclusion required the ability to stand upright and have consistent relief lying down. Candidates (87) were initially evaluated. A subgroup (25) did not enter therapy because of intervening clinical improvement, travel distance, or change in interest. Sixty-two were participants.

METHODS

Self-reported visual analog scale (VAS) and Oswestry scores were primary outcomes. Consenting patients received an OPV or EZ based on a prospective randomization scheme under separate security. Assessment was by independent evaluator at 6, 12, 26, and 52 weeks. Once randomized, the patient saw the principal investigator, blinded to assessment and outcomes, for fitting. Analysis was by repeated measures analysis of variance (ANOVA). A secondary analysis of

change scores between the initial and 52-week outcome was by unpaired *t*-test. A logit model was created to define patient characteristics of successful outcome as improvement $\geq 25\%$ in VAS.

RESULTS

A total of 21 patients failing conservative care elected to have surgery. Another 5 voluntarily withdrew. Despite randomization methods, an initial difference in pain levels (OPV-VAS, 60 ± 23 ; EZ-VAS, 42 ± 21 ; $p \leq .045$) remained. No initial differences in Oswestry scores ($p \leq .28$) were noted. The 36 nonoperated patients were evaluated on primary outcomes. Repeated measures ANOVA on the groups found both improved with time. VAS showed significant group-time interaction effect in favor of OPV ($F = 3.08$, $p = .031$). VAS difference scores between the initial and 52-week evaluations were 40.1 ± 27 for OPV and 19.4 ± 21.8 for EZ ($p = .014$). For Oswestry they were 11.1 ± 18.3 for OPV and 11 ± 10.7 for the EZ ($p = .985$). Three logit variables were statistically significant. They were “group” ($p = .008$), SF-36 mental health ($p = .021$), and energy/fatigue scores ($p = .012$).

DISCUSSION

Both groups improved in pain and function over time, consistent with results of other studies. Use of OPV in discopathy patients with leg pain resulted in a significantly greater improvement in pain levels. The greatest improvement was during the initial 12-week interval. A significant group-time interaction favoring the OPV was observed. Logit suggested that use of the OPV had a 30% greater probability of success. A 10-point increase in mental health and energy/fatigue scores was associated with a 25% and 29% increased likelihood of success, respectively.



Care Access and Distribution Patterns in Coordinated, Integrative Care Settings

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Integration can have different meanings. Recently a conceptual framework for comparing different models has been constructed. Integration ranges from parallel practice to full integration and must be classified for comparing outcomes across different types. Baselines on care utilization are needed beyond the traditional silos of parallel practice to evaluate clinical efficiency.

METHODS

Patient distribution was monitored across five sites providing primary and secondary spine care defined as median-level multidisciplinary integration: common administrative structure, communication and shared patient records, and a spine care team. Patients scheduled by telephone where staff accounted for reported functional deficit, insurance, and preference. Patients were assigned a treating provider (D.C., M.D., or surgeon) for triage and/or care management. Access and distribution were monitored from 2001 to 2004, establishing generalizability. June 2005 served as a practice pattern surrogate. Parameters included scheduled and actual new patients, follow-ups, therapy referrals, advanced diagnostics, and interventional procedures monitored by treating provider type. Data were evaluated by chi-square analysis.

RESULTS

Annual new patient volume was 14,322 (14,198–15,386) varying 5.5%. June was the most stable month (1,374, 50 SD) varying 3.6%. Provider types were 17% chiropractors, 25% M.D.s, and 58% surgeons, showing little change over the epoch. One D.C. left in 2000. Two were added. In 2001, one surgeon semi-retired and three were added. D.C. volume increased from 1,478 to 2,613. Clinic numbers decreased before resuming a gradual upward trend, yet D.C. volume increased by 58%. Scheduled new patients were 22% D.C.s, 12% M.D.s, and 66% surgeons. Overall contrast of provider types against parameters was highly significant ($\chi^2 = 48.3$; $p < .001$). Actual new patients differed from scheduled (20% D.C.s, 36% M.D.s, 44% surgeons; $\chi^2 = 16.5$, $p < .001$) reflecting the net of interdisciplinary cross-referral for management and schedule compliance. Follow-ups similarly

differed by provider with D.C.s producing 35%, M.D.s 27%, and surgeon 38% ($\chi^2 = 10.5$, $p = .005$). Combined referral for physical, occupational, and massage therapy by provider type was 19% D.C.s, 17% M.D.s, and 64% surgeons paralleling provider types ($\chi^2 = 1.93$; $p = .381$). A consistent trend was observed for consultations, advanced diagnostics, and interventional treatments ($\chi^2 = 4.7$; $p = .09$) with D.C. 6.9% (2.4% SD), M.D. 27.8% (9.0% SD), and surgeons 65.2% (10.9% SD).

DISCUSSION

Some observations here support common wisdom about differences between disciplines. Chiropractors have more frequent follow-up visits, may recommend fewer high-cost diagnostic and therapeutic interventions, and generally see fewer secondary spine care patients. Surgeons use the most therapy referrals and sophisticated diagnostics. Several observations pose interesting hypotheses for further study. The proportion of D.C.-managed cases seems higher than expected from the general literature for facilities attracting primary and secondary spine care patients. While the total patients slowly increased, a disproportionate increase was observed for chiropractors that was not substantively altered with 30% expansion of the surgical team. Percent change of new patients for each provider (scheduled vs. actual) suggests that chiropractors participate effectively in primary triage. Proponents of integrative care offer that joint professional interaction will (a) decrease reliance on traditional biomedical models, (b) diminish the reliance on provider hierarchy, and (c) improve outcomes of care. While the data here do not directly test these hypotheses, they provide indirect support for a and b. Moreover, they provide the context for understanding dynamics of patient access and distribution while evaluating outcomes.

CONCLUSION

Future research should consider the distribution of patients by diagnosis and complexity for provider type in assessing care outcomes.



A Systematic Review of the Literature of Cervical Spine Manipulation and the Implications for Practice Management

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There is a growing body of evidence regarding the effectiveness of manipulation of the cervical spine as compared with other treatment methods for neck pain. Published reviews of this body of literature have failed to achieve a clear consensus regarding the efficacy of manipulation for neck pain. Criteria for assessing studies of manipulation have been proposed, but evaluation of the validity of the construct of studies on manipulation is lacking. The purpose of this study was to evaluate the literature on manipulation for neck pain for its quality and to review the literature for insight as to any recommendations that can be made regarding the most efficacious way in which clinicians can approach manipulative care for neck pain.

METHODS

An expert group with clinical and research experience in the application of manipulation was assembled. The group first created a list of potential variables that might affect the outcome of patients who were treated with manipulation for neck pain. A tool to assess the quality of randomized controlled trials (RCTs) was chosen to evaluate the literature. The chiropractic and medical literature was searched using Pub MED, Mantis, and Index to the Chiropractic Literature from 1966 to March 2005 to identify RCTs of manipulation for neck pain. Additional noncomputerized searching of the literature was conducted. The papers were then randomly divided between the group to assess them critically for their quality and for insight into the differing methodological approaches within the studies. Data were compiled and separated into broad categories that related to "patient profiles," "methods," and "interventions," and these

data were compared to the reported outcomes in those studies. The data were then evaluated to ascertain whether management strategies could be recommended to improve clinical outcomes for patients with neck pain receiving manipulative care.

RESULTS

The initial search uncovered 23 papers that were divided between the reviewers. A wide range of methodological differences in the design of the studies evaluated was noted as well as significant ranges in their quality. Recommendations regarding study designs for RCTs looking at manipulation for neck pain were formulated. Clinical considerations for providers of manipulation services to patients with neck pain that may positively impact patient outcomes were also formulated.

DISCUSSION

While the literature on the subject of manipulation for neck pain continues to evolve, practitioners who are providing these services are looking for ways to improve their effectiveness. Clinical trials that compare completely different treatment approaches may be appropriate to evaluate efficacy of the treatment being tested. However, studies comparing groups of patients treated with manipulation that have well documented subtle nuances between management strategies and/or patient profiles may lend better insight into exactly when and to whom a manipulative procedure is best applied.



Listening to Alumni First Annual Survey With Multic-Chiropractic College Participation

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In the spring of 2004, New York Chiropractic College (NYCC) conducted an alumni survey as part of the self-study process for the regional accrediting body. Concurrently, NYCC was also developing a longitudinal student survey system that would track students by anticipated graduation date. It was intended that these two separate survey processes would eventually lead to the ability to observe how program modifications affected outcomes while students were in the program, and what impact these modifications had on the success and satisfaction of alumni. The 2004 Alumni Survey was administered to alumni who had graduated within the last 10 years. Over 700 alumni responded to the survey (a 33% response rate).

Review of the Alumni Survey results lead NYCC to the conclusion that in order for the data to be truly meaningful,

comparison data from other institutions would be required. To determine whether NYCC was fulfilling its mission of providing excellence in education, it would be necessary to look at alumni from other chiropractic colleges. In early 2005, four other chiropractic colleges were invited to participate in a joint alumni survey of those who had graduated 3, 5, and 7 years previously (1998, 2000, and 2002). Of these, two chiropractic colleges agreed to participate in the First Annual Chiropractic College Alumni Survey making for a total of three colleges (Life Chiropractic College West, Life University College of Chiropractic, and New York Chiropractic College). The intent of the survey, conducted in 2005, was to provide data for comparisons and benchmarking that could be used by participating chiropractic colleges.



Bone Marrow Edema of the Ankle and Foot in a Carpenter A Case Report

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The primary purpose of this case report is to illustrate the imaging appearance of extensive bone marrow edema about the ankle and foot in a patient presenting to the chiropractic clinic with foot and ankle pain. Magnetic resonance imaging (MRI) was performed before and after chiropractic intervention. The chiropractic management of a patient with bone marrow edema is discussed with emphasis on the etiology of this stress.

CASE PRESENTATION AND INTERVENTION

A 49-year-old male self-employed carpenter presented to the chiropractic clinic complaining of increasing pain in the right foot and ankle region. Initially a visit to the general practitioner had resulted in analgesic prescription. Due to the continuation of the pain, MRI of the involved foot was obtained. Extensive bone marrow edema was noted, but without explanation as to the etiology. The etiology was established on further questioning as being linked to the use of the new carpentry equipment,

which the patient demonstrated. Chiropractic management was provided for the patient, including advice regarding the equipment use.

RESULTS

MRI performed after 8 weeks demonstrated a reduction in the amount of bone marrow edema. In addition, the patient reported a reduction in the level of pain using the visual analog scale and an increase in the range of movement of the foot.

DISCUSSION

Bone marrow edema may be due to a variety of clinical disorders resulting in hyperemia, such as trauma, disuse, transient and migratory osteoporosis, complex regional pain syndrome, and osteonecrosis. Physical examination of the

patient is often unrewarding and may be aided by the use of imaging. MRI demonstrates the findings of bone marrow edema exquisitely on the fluid-sensitive sequences, particularly the short tau inversion recovery (STIR) sequence. Bone marrow edema is demonstrated on MR imaging as an

intermediate signal on T1-weighted images, and increased signal intensity on the T2-weighted sequence. MRI may be used to follow the response of patients. In this case it was possible to see the gradual resolution of the edema, which correlated with the reduction in pain.



Chiropractic Management of Injuries Sustained During Brazilian Capoeira A Case Series

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Capoeira is a type of Brazilian art—fusing dance, sport, and martial art—and may involve extreme ranges of movement involving the whole body but particularly the lower limb. The year of Brazil in France has encouraged the population to discover the culture of Brazil and the art of Capoeira. Capoeira is an activity that demands strength, precision, and the extreme ranges of movement of the body. Due to the whole body kinematics demanded from Capoeira, a variety of injuries may be sustained. Although previous investigations have been performed studying different forms of dancing, a review of the literature produced no information regarding either the types of injuries sustained with Capoeira or the appropriate management of them.

PATIENT PRESENTATION

Ten patients, all of whom had participated in a group performing Capoeira, presented to the chiropractic clinic with a range of primary complaints and secondary complaints. Complaints included shoulder ($n = 3$), wrist ($n = 1$), cervical region ($n = 1$), lumbar region ($n = 6$), hip ($n = 1$), knee ($n = 1$), and ankle/foot ($n = 3$). The ages of the patients ranged from 22 years to 50 years (average age = 33 years). Eight of the patients were male and two were female. The diagnoses most commonly encountered were facet syndromes of the lumbar spine ($n = 8$) and ankle sprains ($n = 2$).

INTERVENTION

After performing chiropractic examinations of the patients, chiropractic treatment was given including chiropractic manipulation to the spine and extremities, muscular work

including trigger points, and rehabilitation and advice. Chiropractic management consisted of referring one patient out for recurrent dislocations of the shoulder, or chiropractic treatment in the teaching clinic of between 2 and 11 treatments (average, 5). In addition, the patients were advised regarding the movements used in Capoeira.

RESULTS

Nine patients demonstrated a rapid improvement in the original complaint, and one patient was referred directly to an orthopedic surgeon because of multidirectional glenohumeral instability. Nine patients participated in Capoeira without recurrence of the original complaint after chiropractic management.

DISCUSSION

The majority of injuries sustained to the low back in this small case study may be attributable to the long periods of time that the individual is positioned in standing forward flexion. The upper and lower limb injuries were probably a result of the rapid, somewhat violent movements of the body, resulting in ankle sprains and acromioclavicular joint sprains.



Student Satisfaction With Postlecture and Weekly Quizzes

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Many academicians are currently struggling to increase learning in the classroom to improve student outcomes. In a previous pilot study titled "Role of Classroom Assessment in Enhancing Student's Learning," postlecture quizzes, announced in advance, were shown to be a statistically superior method to two other study arms. Students frequently lose attention during class, often preferring to delay study of course content outside of the classroom and frequently immediately prior to examinations. The results of the pilot study demonstrated that simple approaches to prompting students to increase focus and attention during class was a useful, although labor-intensive, pedagogical method. This method, offering frequent feedback to students on performance, has continued to be utilized and now student-perceived impact is measured through the use of a brief satisfaction survey.

METHODS

A brief survey was constructed to evaluate student feedback on postlecture quizzes. The questionnaire was administered at the end of the summer trimester of 2005. The survey of students' opinion on postlecture and weekly quizzes included the following content areas: concentration increase during lecture; facilitated memorization of course material; ease of identifying the main points of the lecture; ease of solving a problem or a case study; and overall satisfaction ratings. The data were entered into the Statistical Package for the Social Sciences for Windows, version 12.0 (SPSS Inc, Chicago, IL), with a 10% check to ensure data entry accuracy. Simple descriptive analysis was performed.

RESULTS

All 59 students completed the brief survey. Generally, student perceptions of the postlecture quiz procedure were very positive. The survey revealed that students believed that their concentration increased during anatomy lectures (mean response 89% on a scale of 0–100), that it was easier to remember material (86%), that it was easier to identify the main points of the lecture (89%), and that it was easier to solve problems or a case study (83%). Overall satisfaction with the process of taking postlecture quizzes was 88%.

DISCUSSION

Educational research indicates that students achieve most of their learning gains outside of the classroom. There are multiple reasons for this. One reason may be simply a lack of attention during instructional periods. The results of the present study show that students can be prompted to increase their attention without decreasing reported satisfaction. By employing a simple classroom assessment technique, faculty prompt students to increase focus during class and provide students with important feedback on what, how much, and how well they are learning. In addition to the benefits to students, faculty can use this information to refocus their teaching and provide students with feedback on the results of assessment and suggestions for improving learning.



Applied Kinesiology in Chiropractic

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The purpose of the study is to investigate important factors that affect the practice of applied kinesiology (AK) in chiropractic care. The research questions in this survey included AK practitioners' attitude toward research; how they used the doctor-initiated, patient-initiated, and simultaneous muscle testing in patient care; and satisfaction with AK practice.

METHODS

This study was conducted through the use of a questionnaire containing 36 questions ranging from demographic factors to factors affecting the practice of AK in chiropractic in the United States. Six hundred eighty-nine surveys were

sent to the membership of the ICAK-USA (593 doctors, 96 chiropractic students). One hundred forty-seven surveys were returned to the ICAK-USA Central office. Frequency analysis, mean values, standard deviation, and correlations were used for the statistical analysis.

RESULTS

A total of 147 AK doctors (120 male, 26 female, one did not report gender) completed the questionnaire. Their ages ranged from 24 to 78 years with an average of 44.6 ± 11.6 . Years in practicing AK ranged from 1 year to 43 years with an average of 14.3 ± 10.2 years. Doctors expressed strong satisfaction in practicing AK with an average of 6.67 ± 0.59 (minimum of 4 and maximum 7). This was the highest rating among all the questions as 90 doctors selected 7 for

the question. Using doctor-initiated testing (4.30 ± 2.33) was rated higher than patient-initiated testing (3.92 ± 2.08). Using simultaneous AK testing was rated between doctor- and patient-initiated testing (3.99 ± 2.30). More doctors differentiate muscle testing styles (61.9%) than do not (32%). Most AK doctors did not use needle acupuncture in their practice, but many of them use noninvasive acupuncture treatment.

DISCUSSION

This information is useful for understanding AK practitioners' opinions and common clinical practices as well as attitudes toward further research. Gender and age did not appear to influence the practice of AK by doctors.



Chiropractic Adjustments Reduced Urinary Incontinence

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Urinary incontinence, inability to control urine while awake or asleep, is a common illness in the elderly. This study presents a Pro-Adjuster spinal adjustment approach to treat elderly and young patients with urinary incontinence. This management approach has not been previously reported.

METHODS

This study was a retrospective case series of clinical observation of patients with urinary incontinence after 1–8 weeks of treatment with Pro-Adjuster technique without any other additional pharmaceutical or physical therapy treatment. All patients were treated in the doctor's office. Standard office procedure was used to document patient status and consent for treatment. In this study, nocturia was defined as any void recorded between the usual time of sleeping and the usual time of awakening. Bladder control was assessed by patient reporting of frequency of nocturia, frequency of urinary urgency, frequency of urinary leakage, and the number of pad changes per day. The primary outcome measure for this analysis was the frequency of nocturia, reported by the patients during each office visit to the chiropractor.

RESULTS

Data from a total of 14 patients (6 female, mean age of 61 ± 20 years old) were included in the study. After 1–8 weeks of chiropractic adjustments, the urinary frequency at night was significantly reduced from 3.8 to 1 time a night ($p < .001$). Three patients improved bladder control with only two adjustments. The child with bedwetting was under complete control. Two female elderly patients regained bladder control and no longer use urinary pads.

DISCUSSION

This study demonstrates that patients with urinary incontinence and nocturia had significant reduction in nocturia with Pro-Adjuster treatment without behavioral therapy or drug therapy. The adjustments given to these patients produced no reported side effects. The results provide evidence that Pro-Adjuster treatment may be useful in chiropractic clinics for management of urinary incontinence. These reductions in nocturia improved patients' quality of life. With regard to future research, larger controlled and randomized studies should be conducted to confirm the beneficial effect of this type of adjustment in patients with bladder control problems.

