

LOGAN SPEAKS...

MAY 2005



Logan Participants Make Strong Contributions to Association of Chiropractic Colleges Meeting

The 2005 annual meeting of Association of Chiropractic Colleges (ACC) and Research Agenda Conference (RAC) took place March 17-19 in Las Vegas. Logan President George A. Goodman, DC, FICC led a delegation of Logan faculty members and administrators in attendance at the conference. The meeting had an intensive research focus, with 12 studies submitted by Logan College presented in platform sessions or via poster presentations.

"Many ACC attendees commented on Logan's strong presence in the research area," says Dr. Goodman. "We commend the excellent work of the many Logan faculty members, students and alumni whose work was showcased at the conference."

Abstracts of all studies presented at the conference also were published in the Journal of Chiropractic Education in March.

In addition to studies submitted to Logan College, additional research presented at the ACC/RAC conference was conducted by Logan alumni holding professional affiliations with other organizations.

Logan alumna Monica Smith, DC (12/86), PhD, a faculty member specializing in health services research at the Palmer Center for Chiropractic Research, was the first author of a study presented during a platform session at the conference. The study was titled, "Chest Pain Report from a Multidisciplinary Focus Group." The study used a multidisciplinary focus group to examine attitudes and experiences of clinicians with chest pain patients, and to identify issues for research.

Alumnus John Triano, DC (1/73), PhD, a researcher and clinician at the Texas Back Institute, was the first author of another study presented during a platform session at ACC/RAC. Dr. Triano's study was titled, "Confounded Association: Cervical Spine Manipulation and Adverse Cerebrovascular Events." The study examined three cases of confirmed cerebrovascular incidents in patients who had undergone cervical spine manipulations. The study



From left, researchers James George, DC, Clayton Skaggs, DC, Debbie Ducar, DC and Brett Winchester, DC are pictured with a research poster at the ACC/RAC conference.

highlights the poor methodology of many reports that may have characterized most such incidents as stemming from the procedures when some cases pointed to serious questions about causality. Two of three cases included in this study are in the "confounded" category, in which causality appears questionable.

Dr. Triano also was the first author of another ACC/RAC platform presentation study, titled, "Procedural Replication During Spinal Manipulation in Clinical Practice."

The study's results supported a hypothesis that when performing adjustments, experienced clinicians modify the load development (force level), based on patient stature.

The remainder of this issue of Logan Speaks features studies submitted by Logan College to the ACC/RAC conference and presented during platform and poster sessions.

Collaborative Research with Barnes-Jewish Hospital Focuses on Musculoskeletal Pain in Pregnancy

- *Conservative Management of Groin Pain During Pregnancy: A Descriptive Case Study.* Debbie Ducar, DC, Clayton Skaggs, DC;
- *A Comprehensive Muscular Management Program Reduces Pain and Disability in Pregnancy.* Clayton D. Skaggs, DC, D.M. Nelson, MD, PhD, Gilad Gross, MD, Paul Thompson, PhD, Debbie Ducar, DC;
- *A Manual Therapy Approach to Meralgia Paresthetica in Pregnancy: A Case Report.* Clayton D. Skaggs, DC, Daryl C. Rich, DC, Brett A. Winchester, DC, Heidi Prather, DO.

Logan College is conducting ongoing research at the Musculoskeletal Pain in Pregnancy (MSPP) clinic at Barnes-Jewish Hospital in St. Louis, in affiliation with the Washington University School of Medicine. The research is led by Clayton Skaggs, DC, associate professor of research at Logan and an adjunct faculty member in the Department of Obstetrics at Washington University School of Medicine.

Dr. Skaggs co-founded the MSPP Clinic with Mike Nelson, MD, vice/chairman in the Department of Obstetrics at Washington University. Logan research resident Debbie Ducar, DC, devotes most of her time to the MSPP research at Barnes-Jewish and contributed to two of three studies from the MSPP clinic that were presented at the ACC/RAC conference.

Dr. Ducar gave a platform presentation of the case study on groin pain during pregnancy at the ACC/RAC conference.

"Case reports are important," says Dr. Skaggs. "They lay the foundation for expanded research."

In the case study, manual therapy and stabilization exercises were used to address low back pain and groin pain in a 32-year-old pregnant woman. The subject was instructed on proper mechanics for daily activities, given post-isometric relaxation and specific

stabilization exercises, and was treated with soft tissue work and Active Release Technique. After two treatment sessions, the patient showed significant reductions in pain and disability. After three months, she continued to report no pain or restriction in daily activities.

The comprehensive muscular management program was a large-scale study presented by Dr. Skaggs during a platform session at ACC/RAC. In addition to Drs. Skaggs and Ducar, additional authors of the study are faculty members at the Washington University School of Medicine.

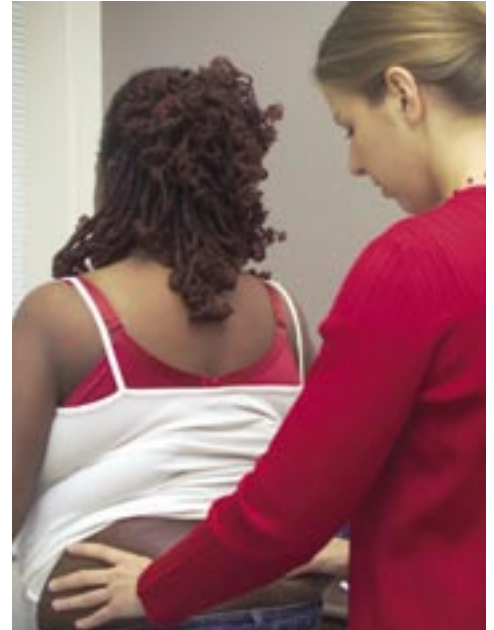
"While we did show clinically significant changes, the results are only preliminary and need to be expanded in several methodological areas," says Dr. Skaggs.

The study examined 58 pregnant women with complaints of musculoskeletal pain at the MSPP clinic over a three-month period. Their treatment program included patient education on proper biomechanics for daily activities, manual therapy, and specific stabilization exercises. The therapeutic interventions included soft tissue work and adjusting, primarily with Diversified Technique. The study's participants reported a significant decline in pain between their first and second visits, using the Bourne-mouth Questionnaire.

"This does move us closer to answering the questions of what can be done to help pregnant women with pain and what is the best intervention," says Dr. Skaggs.

Current research underway at the MSPP clinic is focusing on muscle endurance and strength post-partum. The research will assess whether muscles are weaker after pregnancy.

In writing the case study of meralgia paresthetica in pregnancy, Dr. Skaggs was joined by Logan research associate Daryl Rich, DC; Brett A. Winchester, DC, instructor of chiropractic science at Logan; and Heidi Prather, DO, of the Washington University School of Medicine. The study became a poster presentation at



At the MSPP clinic, Dr. Ducar examines a patient.

the ACC/RAC conference.

Meralgia paresthetica (burning, pain or numbness over the outer and front portion of the thigh) results from entrapment or pinching of the nerve that supplies sensation to the outer portion of the thigh. The condition is often associated with an enlarged stomach, due to obesity or pregnancy. The patient profiled in the case study was a 22-year-old woman who came to the MSPP clinic in her 16th week of pregnancy.

Following diagnosis, which was based on motion tests and physical exam signs, the patient received evaluation and manual therapy over a six-week period. Active Release Technique (ART) was used at the restricted right sacroiliac joint complex and in the area of nerve entrapment. The patient also performed stabilization and relaxation exercises at home. She reported a 90 percent improvement in leg symptoms. At a follow-up after one year, she had no other complications or pain.

Technique Research Explores Intriguing Aspects of Adjusting Methods

Phantom Limb Pain/Sensation Treated with Logan Basic Chiropractic Technique: A Report of Two Cases. Christopher N. Shoff, DC and Connie J. D'Astolfo, DC.

Christopher N. Shoff, DC (12/01), a member of the Logan Alumni Association board of directors, took to heart the college's encouragement of practicing alumni to publish studies based on patient treatments.

While Dr. Shoff was a student at Logan, faculty member and archivist Allen Parry, DC, discussed with him anecdotal reports of Logan Basic Technique's effectiveness in treating phantom limb pain. At that time Dr. Shoff's father, Niles Shoff, DC, was undergoing an amputation as a result of complications of diabetes.

When Dr. Shoff saw two patients with phantom limb pain at the clinic in Albert Lea, Minn., where he is now in practice with his father, he decided to try to publish the results of his care. Via the American Chiropractic Association e-mail list-serve, Dr. Shoff met and recruited Connie D'Astolfo, DC, who is working on a master's degree in health administration at the University of Toronto, to assist with design of the study. In searching for previous research, the authors found nothing published on chiropractic treatment and phantom limb pain.

"The two cases are very different," says Dr. Shoff. "The first patient was a young man who had had a traumatic amputation after a motorcycle accident, and the other is an elderly woman, a diabetic amputee."

The young male subject reported no symptoms of phantom pain for one year after one treatment that added a Logan Basic adjustment to his Diversified adjustment treatment plan. The female subject reported

a decrease in frequency of pain from a daily event to monthly episodes that also are less intensely painful than in the past. Both patients also reported decreases in low-back pain following the added application of Logan Basic. The Logan Basic adjustment, used on both patients, was the apex contact.

The subjects' results were based on subjective reports and on a visual analog pain scale used before and after treatment. On its own, according to the literature, phantom limb pain does not usually decrease over time.

Logan College assisted Dr. Shoff in submitting his study for consideration by the ACC/RAC conference research selection committee. Dr. Shoff attended the conference and gave a poster presentation of the study.

The Effects of Active Release Technique (ART) on Hamstring Flexibility: A Pilot Study. James W. George, DC, Rodger Tepe, PhD, Clayton Skaggs, DC.

ART® (Active Release Technique) is a soft tissue management system developed by P. Michael Leahy, DC, CCSP. The ART® practitioner works to restore optimal texture, motion, and function of soft tissue. The technique is also

designed to address entrapped nerves by removing adhesions or fibrosis in the soft tissues. Adhesions may result from injury, repetitive motion, constant pressure or tension.

Athletes are often prone to injuring the hamstring muscle group. The muscles' lack of flexibility has been cited as a contributing factor in their injury proneness. Logan alumnus James W. George, DC (4/04) elected to conduct research on the use of Active Release Technique to address hamstring flexibility. There is preliminary evidence supporting ART in combination with joint mobilization or manipulation for treatment of soft tissue injuries. However, its effectiveness in improving muscular flexibility has not been demonstrated.

Advising Dr. George were Rodger Tepe, PhD and Clayton Skaggs, DC, of the Logan research faculty. Dr. Skaggs specializes in Active Release Technique.

The study used 20 active male subjects with no history of injury in the lower extremities. A sit-and-reach test was used to assess each subject's hamstring flexibility, before and after ART application on the origins and insertions of the hamstrings as well as the dorsal sacral ligament.

There were significant differences in the pre-ART and post-ART data. All 20 participants increased their sit-and-reach scores in the post-ART test.

The researchers recommended that future studies utilize this preliminary investigation as a foundation and examine the use of ART in subjects who are symptomatic and who have lower than normal hamstring flexibility. Such a study would indicate whether ART is effective in addressing hamstring flexibility deficits.

continued on page 4



Dr. Snyder discusses his research on the Toftness method with a student. (See following page.)

continued from page 3

Interexaminer Agreement of Five Examiners Using Activator Methods Chiropractic Technique Leg-Length Analysis. Matthew Holstein, DC, Dave Backus, DC, Rodger Tepe, PhD.

Activator Methods Chiropractic Technique has extensive documentation of inter-examiner agreement and consistency in prone leg-length analysis (Deerfield leg length test), a key biomechanical assessment method used by Activator Methods practitioners. Previously published studies have shown such agreement in determining the short leg in Position 1 (extension). No published studies, however, had previously shown consistency in both Position 1 and Position 2 (flexion).

Dave Backus, DC, and his student research project partner, Matt Holstein, DC, researched the latter question to satisfy their Logan research requirement for their graduation from Logan in August 2004. At that time, both researchers had completed the intensive certification program in Activator Methods.

"We were looking for a project that would be doable given our resources, but that also would break some new ground from the standpoint of research on the technique," says Dr. Backus, who is now in practice in Phoenix.

The students contacted Logan alumnus Arlan Fuhr, DC (9/61), co-developer of Activator Methods. With Dr. Fuhr's guidance, they chose the dual-position leg length analysis topic for their research.

The researchers selected five fellow students who also had advanced proficiency ratings in Activator Methods to conduct the leg length tests. The examiners performed the tests on 132 normal volunteers from the Logan student body. The results: Statistically significant interexaminer agreement in both Position 1 and Position 2.

"Activator places great emphasis on accuracy and reliability of the leg length tests," says Dr. Backus. "The certification program devotes a great deal of time to training in correct application

of the tests. Since they are so integral to the practice of the technique, research that validates the tests is very important."

Project adviser Rodger Tepe, PhD, helped prepare the study for poster presentation at the ACC/RAC conference. Drs. Backus and Holstein attended the conference and answered questions as attendees reviewed the poster.

Low-Force Chiropractic Adjustments

WE HAD VERY SUBSTANTIAL, SIGNIFICANT REDUCTIONS IN PAIN AND DISABILITY IN BOTH GROUPS.

~ DR. SNYDER

on Acute and Chronic Low-Back Pain.
Brian J. Snyder, DC, John Zhang, MD, PhD

Logan College is continuing its ongoing series of studies on the Toftness method of chiropractic adjusting, which have been funded by grants from the Foundation for the Advancement of Chiropractic Research (FACR).

The most recent study, given as a poster presentation at ACC/RAC by primary researcher Brian Snyder, DC, associate professor of chiropractic science at Logan, focused on subjects with both acute and chronic low-back pain. Its publication in the *Journal of Chiropractic Education* marks the seventh publication on the Toftness method by Logan College.

The study included 10 subjects with acute low-back pain and 12 subjects with chronic low-back pain. They received treatment with a minimum of eight Toftness adjustments over a period of four to six weeks. The low-force method, developed by the late I.N. Toftness, DC, includes the hand-held spinal analysis unit and the Toftness instrument, which applies pressure to mobilize joints and provides a measure in ounces of how much pressure is

being applied.

Pain was measured by the visual analog scale (VAS) and the Oswestry Disability Questionnaire. Pain and disability scores were reduced significantly in both the acute and chronic pain groups after the four-to-six-week treatment period.

Numerous major research studies showing the effectiveness of chiropractic for acute low-back pain have been well-publicized over the past 10 years, and research studies on chiropractic and chronic low-back pain also have shown positive results. The new Toftness study actually had slightly better results with the chronic pain subjects because they began with somewhat higher pain and disability scores, but achieved post-treatment scores similar to those of the acute subjects.

"We had very substantial, significant reductions in pain and disability in both groups," says Dr. Snyder. "We believe we have a lot of potential for future research and publication on use of the Toftness method for both conditions."

"Logan Speaks" is a publication for the alumni and friends of Logan College of Chiropractic.

George A. Goodman, DC, FICC
President

William L. Ramsey, PhD
Vice President
Academic Affairs

Sharon Kehrer, MBA
Vice President
Administrative Affairs

Patrick Browne, EdD
Vice President
Enrollment Services

Gary Gross, MA
Vice President
Finance

Patricia Jones
Vice President
Institutional Advancement

Correspondence should be addressed to:
"Logan Speaks" Logan College of Chiropractic
1851 Schoettler Rd.
P.O. Box 1065 Chesterfield, MO 63006-1065

Cooperative Research with Massachusetts General Hospital Examines Acupuncture and Carpal Tunnel Syndrome

Effect of Acupuncture on Carpal Tunnel Syndrome with fMRI Assessment of Cortical Somatotopy. Norman W. Kettner, DC, DACBR, Vitaly Napadow, PhD, Jing Liu, LicAc, Angela Ryan, MD, Ming Li, LicAc, Ken Kwong, PhD, Kathleen Hui, MD, Joseph Audette, MD.

Research on acupuncture and pain continues at the Athinoula A. Martinos Center for Biomedical Imaging at Massachusetts General Hospital, which partners with Logan College in sponsoring studies on this topic. The research utilizes functional MRI to evaluate the effects of acupuncture on neural networks of the brain involved with pain processing. Norman W. Kettner, DC, DACBR, chairperson of the Logan Radiology Department, designed an initial study and subsequent research being conducted at the center.

The other authors of the study on acupuncture and carpal tunnel syndrome, on which Dr. Kettner gave a platform presentation at the 2005 ACC/RAC conference, include faculty members of the Harvard University Medical School or of the Spaulding Rehabilitation Hospital. The hospital is a teaching affiliate of Harvard Medical School and is ranked 8th among rehab hospitals nationally by U.S. News and World Report. Co-author Vitaly Napadow, PhD, a primary researcher in the acu-

puncture program, is an adjunct faculty member both of the Logan Radiology Department and of the Harvard Medical School Department of Radiology.

Dr. Kettner's ACC/RAC platform presentation was the conference's first research presentation to include fMRI in evaluation of subjects, attracting substantial interest and many questions.

The study examined subjects with mild to moderate carpal tunnel syndrome as indicated by physical examination, functional tests and nerve conduction velocity tests. The subjects received 13 manual and electroacupuncture sessions over five weeks. Improvements in neuropathic symptom severity were noted at two weeks and five weeks, with significant difference shown between subjects who received treatment and control subjects.

The functional Magnetic Resonance Imaging scans post-treatment showed a decrease in hyper-excitation in the cortex of the brain. This result helps provide a potential explanation of the mechanism by which the acupuncture treatments produced improvement in the patients.

"The fMRI finding is especially interesting in that we literally 'calmed down' the brain, reducing the hyper-excitation in the cortex," says Dr. Kettner. "Research on carpal tunnel

syndrome has always focused on the peripheral nervous system, not the central nervous system. Conditions in the peripheral nervous system impact the central nervous system and vice versa, through an input/output system. We have shown that altering what the central nervous system is doing -- what's happening in the brain -- changes the patients' nerve functioning in a positive way, as indicated by the treatment subjects' results."

Although fMRI has been crucial to the acupuncture conducted by Dr. Kettner and his colleagues at Massachusetts General, Dr. Kettner says that other imaging technologies may have even greater potential. The acupuncture research program will soon implement research incorporating magnetoencephalography (MEG). MEG measures magnetic fields produced by electrical activity in the brain and shows changes in the fields as areas of the brain are activated, providing a visual map showing positive and negative fields.

"MEG offers better temporal resolution than fMRI as events happen," says Dr. Kettner. "We believe it will be very useful in our research."

Institutional Research Project Includes 96 Field Doctors

Effects of Chiropractic Care on Heart Rate Variability and Pain in a Multisite Clinical Study. John Zhang, MD, PhD, Douglas Dean, PhD, Dennis Nosco, PhD

Logan College's research direction in recent years has included the goals of encouraging and supporting research by practicing DCs, and also of including field doctors in institutional research. One of the college's first large-scale studies to include data from the field, a multi-site clinical study on heart-rate variability, was among poster presentations at the ACC/RAC conference.

Logan Associate Research Director John Zhang, MD, PhD and his co-authors, Research Director Douglas Dean, PhD, and former Logan Research Director Dennis Nosco, PhD, recruited 96 DCs to participate in the study. About 70 percent of the participants were Logan graduates.

Each participating DC was provided with a heart-rate variability device to perform analysis before and after an initial chiropractic adjustment. About 20 percent of the initial 625 subjects also were followed over a four-week period, with final heart-rate variability measurements

documented. Pain was measured via a visual analog scale (VAS).

The study was based on the premise that the chiropractic adjustment has a positive effect on the balance of the autonomic nervous system, and that positive effect should be demonstrated by increased heart-rate variability among patients post-adjustment. Heart-rate variability, which typically declines with age, is associated with good cardiac health.

"Declining heart-rate variability is seen with many disease processes, such as hyper-

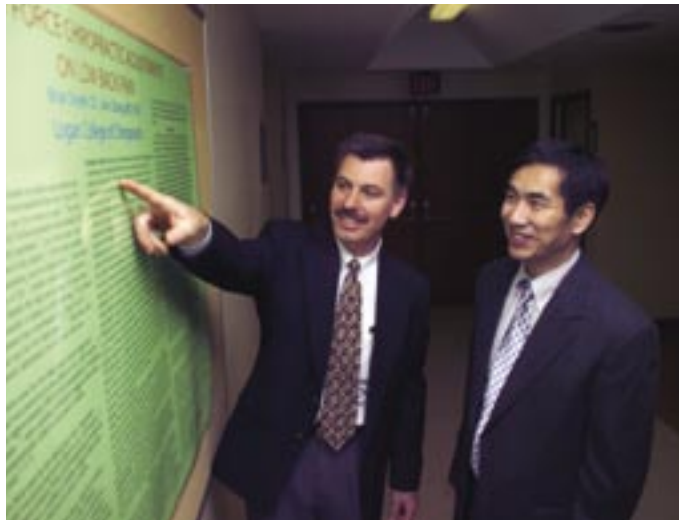
continued on page 6

continued from page 5

tension, stroke, and diabetes, and with some mental states such as depression and anxiety," says Dr. Zhang. "Increased variability is associated not only with good health, but with improved performance in athletics and good physical fitness. Pain was also measured in the study because it is associated with reduced heart-rate variability, and because many patients come to chiropractors with pain."

Participating clinicians could choose the adjusting techniques that they used, with the majority using Diversified and Activator Methods.

The study's results showed that after one adjustment, heart-rate variability increased significantly and mean heart rate decreased significantly, also a desirable outcome. After four weeks, variability was again significantly increased, while the decline in mean heart rate at that stage was not significant. Pain was reduced significantly after one adjustment, but the results did not indicate significant decline in pain levels at the four-week period.



Dr. Zhang (right) is pictured with Dr. Brian Snyder and a research poster in the Logan Research Department.

Nutrients Impact Blood Pressure

Taking Nutritional Supplements for Three Months Reduced Blood Pressure but Not Blood Lipid Levels in Students.

John Zhang, MD, PhD, Rebecca Bateman, Shastidy Metzger, Kurt Lanigan

With literature supporting the positive impact of eating fruits and vegetables, especially dark green leafy vegetables, on cardiac health, Logan Associate Research Director John Zhang, MD, PhD, decided to investigate the impact of a green vegetable supplement.

Student research assistants Rebecca Bateman, Shastidy Metzger and Kurt Lanigan assisted with the study. Dr. Zhang gave a poster presentation on

the study at ACC-RAC.

A total of 40 Logan students and faculty members took the green vegetable supplement for 90 days, with blood and saliva biochemistry tests administered before and after that period. After 90 days, subjects' systolic and diastolic blood pressure rates were significantly lower. Heart rate and heart-rate variability were both decreased, but not significantly. Also, there were no significant changes in total cholesterol or low-density lipoprotein ("bad" cholesterol, or LDL). High-density lipoprotein ("good" cholesterol, or HDL) decreased significantly and triglycerides (blood lipids) were slightly higher.

Dr. Zhang theorizes that changes in students' stress levels or diets, which were not controlled in the study, may have led to the undesirable blood results for HDL and triglycerides.

"The blood pressure decline was especially interesting in that many subjects who were in the 'normotensive' range had decreases, as did the hypertensive individuals," says Dr. Zhang. "The desirable range for blood pressure is less than it was in the past. For example, 85 is in the normal range for diastolic pressure, but it is preferable under today's standards to have a diastolic measure below 80. Any nutritional approach that results in lower blood pressure should help decrease risk of cardiovascular disease.

Study Examines Chiropractic Care and Balance

A Randomized Controlled Trial of the Effects of Full-Spine Manipulation on Rocker Board Performance. *Rodger Tepe, PhD, Monica Matzker, Eric DeRoche, Rebekah Schell.*

Dr. Rodger Tepe believes that chiropractic has much potential to help some of the more than 5 million patients reporting symptoms of vertigo and other equilibrium disorders each year, and help elderly people avoid danger-

ous falls. Many balance problems result from dysfunctional proprioceptive function and processing, he explains. Based on the chiropractic principle that spinal manipulation helps normalize neurological function, the study he designed used a rocker board to test subjects' balance before and after spinal manipulation. Co-authors Monica Matzker, DC, Eric DeRoche, DC, and Rebekah Schell, DC, worked on the study, which it became their senior

research project, a requirement for graduation from Logan College.

Dr. Tepe gave a platform presentation of the study at the ACC/RAC conference. The authors recruited 48 non-symptomatic subjects. The treatment group received full-spine Diversified adjustments between one-minute tests during which they attempted to balance on the rocker board. Time on the rocker board was







continued on page 7

continued from page 6

kept to a minimum to prevent a training effect resulting from extended "practice" on the board. The control group had five minutes of seated rest between the two rocker board tests. The treatment subjects had significantly improved rocker board performance after being adjusted, while the control subjects did not improve their performance on the rocker board.

"I feel there is vast potential for exciting research on this topic," says Dr. Tepe, who has additional studies planned. "Our next rocker board balance study will use the Pro-Adjuster, developed by Dr. Maurice Pisciotano.

"Eventually we also hope to conduct large-scale trials and to study symptomatic subjects," adds Dr. Tepe. "Asymptomatic populations can also benefit from improvements in proprioceptive function and balance. For example, all athletes rely on balance and equilibrium in one way or another in order to perform well, so balance can be key to enhanced performance and injury prevention. Many injuries result from balance problems. There are important implications for research on this topic, ranging from helping young gymnasts perform better to helping the elderly avoid falls."

OUR NEXT  ROCKER BOARD  BALANCE STUDY  WILL USE THE  PRO-ADJUSTER,  DEVELOPED BY DR.  MAURICE PISCIO-TANO.

~ DR. TEPE

Research Breaks New Ground in Investigation of Scoliosis

Initial and Treatment-Induced Changes to Muscle Activation Patterns in Patients with Adolescent Idiopathic Scoliosis Compared to the Frontal Plane Spinal Configuration as Measured with Surface Electromyography. Raymond Wiegand, DC.

Raymond Wiegand, a former research associate and adjunct faculty member at Logan College, has devoted much of his career toward the treatment and research of scoliosis. Dr. Wiegand currently has a practice in Weldon Springs, Mo., that is dedicated to treatment targeting the progression of scoliosis.

Dr. Wiegand's methods and the research on paraspinal muscle activity were presented as a poster at this year's ACC/RAC conference.

"In dual curve scoliosis, muscles are likely to have become unilaterally hyperactive on one or both curves," says Dr. Wiegand. "In our review of nine patients, all had hyperactivity on the concave side of at least one curve. Our hypothesis was that inhibiting the imbalance and hyperactivity of the paraspinal muscles would slow or halt progression of the curvature, because these variables may contribute to development and progression of scoliosis. The development of a secondary curve may be a compensatory response by the righting and balance reflexes to an unbalanced single curve, an attempt to re-establish global spinal balance."

Dr. Wiegand used dual-channel surface electromyography (SEMG) to evaluate bilateral muscle activity at nine paraspinal locations. Normal bilateral muscle activity in an uninjured adult population at rest is reported to be approximately 5 ± 2.5 micro-volts (μV). The patients in these case studies exhibited unbalanced values as high as 300 μV .

"We were able to significantly inhibit hyperactivity in every subject and halted curve progression in eight of the nine patients," says Dr. Wiegand. "Interrupting curve progression may alleviate the need for bracing and/or surgery. Patients with adolescent idiopathic scoliosis do

require monitoring as long as they continue to grow, however."

Dr. Wiegand's scoliosis treatment program includes spinal adjusting based on digital analysis of spinal radiographs via a computer system that he developed over the past twenty years. The mathematical software analyzes the geometry of the spine, including abnormalities of vertebral architecture, intersegmental alignment and segmental and regional coupling (the lateral bending relationship from one region of the spine to the next). Statistical analysis is used to identify which vertebrae have the most aberrant alignment and dysfunction. Then specific adjustment vectors are calculated.

The treatment program also includes intensive office and home-based exercise, stretching and an "unweighting" gait-training program. In the gait-training program, the patient wears a vest that hooks into a pneumatic system that can reduce body weight by 35 percent. The vest also provides lateral compression of the spinal curves while connecting straps provide correction of internal and external leg rotation. Patients then engage in forward, sideways and backward gait training. Specific unilateral extension exercises of the paraspinal muscles are performed in a chair using pneumatic resistance at specific vertebral levels. The extension exercises inhibit hyperactivity while strengthening the spinal muscles on the convex side of the scoliosis curve.

"No one knows the reason why paraspinal muscles initially become unbalanced and hyperactive," says Dr. Wiegand. "It may be an inappropriate central nervous system response to spinal trauma. One interesting observation was that all these patients demonstrated the radiographic findings of a cervical whip-lash or sudden impact type injury."

Dr. Wiegand is hopeful that by continuously reviewing and analyzing the treatment outcomes, it will lead to improved clinical procedures and results for the scoliosis patient.

Dr. Skaggs Researches Jaw and Neck Muscle Activity

Muscle Activation Patterns for the Jaw and Neck During an Endurance Test.
Clayton D. Skaggs, DC, John R. Gray, MS,
Stuart M. McGill, PhD.

Clayton Skaggs, DC, associate professor of research at Logan, has taken more than 600 hours of post-graduate study of temporomandibular joint dysfunction (TMD). He works with researchers at the University of Waterloo, which has one of the most recognized laboratories in the world addressing biomechanics, on collection of normative data on jaw opening and the influence of neck muscles on jaw function. Two of his colleagues from Waterloo, John Gray and Stuart McGill, worked with him on a study of muscle activation patterns in the jaw and neck.

TMD patients often are advised to practice unclenching their teeth and jaws, utilizing what is called a "resting" position with the tongue against the roof of the mouth, teeth apart and lips closed. On a separate point of interest, athletes in training situations, such as weightlifting, often are advised by trainers to press their tongues against the roofs of their mouths in order to enhance their muscular performance. Dr. Skaggs devised a muscle activation study that would provide some indication of the effectiveness of the resting position in both situations.

The study's hypothesis was that conscious activation of the orofacial muscles would increase muscle co-activation in the jaw and improve performance during a neck stability and endurance test.

Five women and one man, none of whom had any history of TMD pathology, were evaluated in varying jaw muscle activity levels: none, light, and forceful. Those in the first category completely relaxed their jaws and mouths. Those in the light category used the resting position, which has been documented as involving minimal muscular activity. Subjects in the "forceful" group forcefully pushed their tongues into the roofs of their mouths, kept their teeth apart and pursed their lips. Muscle activity of jaw and neck muscles was measured via SEMG (Surface Electromyography). A stabilization and endurance test was used to measure performance of the neck muscles in each group.

Previous studies show that deliberate teeth/jaw clenching increased activity in the masseter jaw muscle up to 33 times, while the resting position in this study increased masseter activity only slightly. Increases in masseter activation have been correlated with TMD and altered jaw function. Thus, the resting position, which the authors believe would more appropriately be

called the "neutral" position, appears to have some clinical value as a behavior modification tool for the jaw muscles and for decreased masseter activation.

The authors believed that possible athletic benefit of the resting position might result from biomechanical and neurological linkages, and resulting reflexive relationships that have been documented, between the temporomandibular joint and the cervical spine.

"We did not observe improvement in performance of the neck muscles in the stabilization and endurance task in subjects in the resting position," says Dr. Skaggs. "This suggests that the orofacial activation and 'neutral' position do not have value for athletic performance. Interestingly, the suprahyoid muscles had the highest relative contraction for the neck stability task. This result suggests that diagnosis and treatment of neck problems should include some focus on these muscles, which is not generally the case. Our next pursuit will be to conduct similar trials on subjects with neck pain and/or jaw pain and problems."

Dr. Skaggs presented the study during a platform session at the ACC/RAC conference.

"Logan Speaks"

Logan College of Chiropractic
1851 Schoettler Rd., P.O. 1065
Chesterfield, MO 63006-1065

Address service requested.

Non-Profit Org.
U.S. Postage PAID
Permit No. 1197
St. Louis, MO