



Dynamic Chiropractic – June 17, 2004, Vol. 22, Issue 13

Believe It or Not, Chiropractic Science Is Evolving!

By William Meeker, DC, MPH, FICC

Most of the profession does not keep up with advances and controversies in chiropractic science, if attendance at scientific meetings and readership levels of our scientific journals is any indication. For example, the *Journal of Manipulative and Physiological Therapeutics (JMPT)* still has fewer than 3,600 subscribers. This is a shame considering that in the scientific community interested in spinal research, *JMPT* has an impact score only slightly lower than that of the premier journal *Spine*.

My point? There is a quiet, but very important evolution happening in chiropractic science. This was amply demonstrated at the last combined meeting of the Association of Chiropractic Colleges - Research Agenda Conference (ACC-RAC), held in March in Las Vegas. It is also demonstrated in the profession's increasing ability to compete for research grants from the National Institutes of Health and other federal funding agencies.

With more than 400 attendees, ACC-RAC 2004 was the most successful meeting in many years, and the quality of the presented work was a major step forward from what was happening even just five years ago. But beyond the general increase in quality demonstrated by faculty scholars, some areas of research were notable for demonstrating a significant increase in the amount of research being done, and by a larger number of investigators than ever before. Furthermore, there is a remarkable increase in the use of sophisticated methods regarding how research questions are being asked and answered. One of the most exciting developments is in basic science approaches to chiropractic theory, especially the interface between spinal biomechanics and neuroscience. There are now enough experts in different locations around the globe to tackle different aspects of this area, and we are now starting to see how all this research can dovetail together.

For example, I will describe just one breakout session at ACC-RAC that generated a great deal of discussion. It was titled, "Mobilization and Manipulation: Any Difference?" Astute readers will recognize at

once that this is a very controversial issue, with current opinions ranging as widely as possible. What makes this question so important, beyond the obvious clinical concerns, are the large policy implications regarding chiropractic theory; professional identity; interprofessional rivalry with physical therapists, massage therapists, MDs, DOs, and others; reimbursement; malpractice risk; and education.

Chiropractic tradition, training and practice have a decided preference for high-velocity, low-amplitude (HVLA) maneuvers that we call adjustments. HVLA techniques are part of our heritage and identity, and they are part of what sets us apart from other professions that profess expertise in manipulation. But we also know from many surveys¹ that chiropractors also use many joint-mobilizing procedures, which can be labeled low-velocity, variable-amplitude (LVVA) maneuvers. We also know that HVLA maneuvers are viewed with trepidation and suspicion by some who believe, without good data, that they might be risky for patients, especially in the cervical spine.

During this session, Eric Hurwitz, DC, PhD, an epidemiologist on faculty at UCLA, and one of our finest clinical scientists, presented data from one of his randomized clinical trials conducted over the past few years.² In this one, the clinical outcomes of HVLA adjustments were compared to joint mobilizations for patients with neck pain. All of the treatments were delivered by typically trained and experienced chiropractors in a randomly assigned fashion, such that about half of the patients received HVLA maneuvers and the rest received mobilizing procedures. When the data were analyzed, both groups improved equally well. There did not appear to be any significant differences, clinically or statistically, between them. The conclusion based on this data is that mobilization and manipulation provided by chiropractors for these kinds of patients lead to the same level of beneficial outcomes.

I don't think anyone in the audience enjoyed hearing this; who wants to have their dearly held opinions challenged, even if it is with excellently conducted research? Dr. Hurwitz underwent a grilling about his methods, the training and experience of the chiropractors, and any other detail that could have led to this unexpected and unwelcome result. Fair enough; but what really hurt was the parallel analysis of the same patients regarding side-effects. It turns out that patients receiving HVLA adjustments had a greater number of side-effects than patients receiving LVVA mobilizations. Patients who reported adverse effects were also less satisfied with their care and less likely to have clinically meaningful improvements in pain and disability.³

We may not like it, but this is data that cannot be ignored because it is so clinically relevant. Our patients certainly deserve our most careful scrutiny of these findings, and we can be sure that our rivals will use it to their advantage if possible. What makes this scientifically fascinating is that other chiropractic investigators are finding apparent differences between HVLA and LVVA procedures at the basic science level. For example, Dr. Ram Gudavalli's and Dr. Joel Pickar's presentations left little doubt that the two categories of procedures have different biomechanical properties; the force-time profiles are distinctive. Furthermore, as session leader Greg Kawchuk, DC, PhD, pointed out, these and other basic science studies have found significant differences between HVLA and LVVA mobilization; for example, regarding pain tolerance,⁴ cervical mobility,⁵ increasing joint space^{6,7} and EMG response.⁸ Clearly, the reasons why apparent physiological differences may not translate to a difference in clinical outcome need to be explored. This is starting to happen in a coordinated way, with just one example described as follows.

The Palmer Center for Chiropractic Research has received NIH funding for a "Center for the Study of Mechanisms and Effects of Chiropractic Manipulation." The center includes four interrelated projects in which, in part, we will attempt to elucidate both physiological and clinical differences between HVLA and LVVA procedures. We are going to apply this body of knowledge in two animal models and one clinical scenario, in order to get a better handle on whether, and if so, how, the HVLA and LVVA biomechanical profiles yield different clinical and physiological responses.

Project 1 is led by Joel Pickar, DC, PhD, and Partap Khalsa, DC, PhD, from State University of New York. It focuses on the changes in neural discharge from paraspinal receptors in the facet joint capsule. To date, nothing is known about the response characteristics of these neurons. Project 1 uses state-of-the-art technology to determine how facet joint afferents respond to HVLA and LVVA mechanical loads.

Project 2 is led by Charles Henderson, DC, PhD, and Tae-Hong Lim, PhD, from the University of Iowa. It focuses on vertebral fixation (hypermobility) and mechanical loads. Dr. Henderson has previously established a spinal fixation model that causes increased spine stiffness and degenerative spine changes in the rat. The investigators are extending the use of this model in two ways. First, they will evaluate behavioral changes that may occur with spine fixation. This would provide the first animal model to investigate the relationship between the integrity of the vertebral column and a general state of well-being. Second, they will determine the effects HVLA and LVVA manipulative loads on the fixation-induced stiffness and the degenerative changes within the spine itself.

Project 3 is a clinical study co-led by David Wilder, PhD, of the University of Iowa, and myself. We are studying 250 patients with back pain to explore which clinical parameters, biomechanical parameters and neuromuscular parameters might have predictive value for determining which patients will benefit from HVLA and LVVA techniques. The character of those parameters would point to scientific directions that can be explored more mechanistically. Being able to know what kinds of patients will respond best to which techniques will be extremely helpful in clinical practice.

Project 4 is being conducted by Joel Pickar, DC, PhD, and Michael Kinney, PhD, at Kansas State University. It addresses the issue of whether vertebral dysrelationships have somatovisceral consequences by measuring sympathetic nerve discharge to four different organ beds in a rat model. In addition, the possibility that vertebral dysrelationships affect the state of the central nervous system will be investigated by looking at the effects of high-velocity adjustments, both in the presence and absence of an imposed mechanical load.

It is exciting to see chiropractic science come to a stage in its evolution at which entire multidisciplinary programs of research are possible. This means that more comprehensive and rapid answers to important chiropractic questions may now be within our own reach. Stay tuned.

References

1. Christensen M. *Job Analysis of Chiropractic*. Greely, Colo. National Board of Chiropractic Examiners 2000.
2. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: Clinical outcomes from the UCLA Neck Pain Study. *Am J Public Health* 2002;92 (10):1634-41.
3. Hurwitz EL, Morgenstern H, Vassilaki M, Chang LM. Adverse reactions to chiropractic treatment and their effects on satisfaction and clinical outcome among patients enrolled in the UCLA Neck Pain Study. *J Manipulative Physiol Ther* 2004;27(1):16-25.
4. Terrett AC, Vernon H. Manipulation and pain tolerance. A controlled study of the effect of spinal manipulation on paraspinal cutaneous pain tolerance levels. *Am J Phys Med* 1984;63(5):217-225.
5. Nansel DD, Cremata E, Carlson J, Szlazak M. Effect of unilateral spinal adjustments on goniometrically-assessed cervical lateral-flexion end-range asymmetries in otherwise asymptomatic subjects. *J Manipulative Physiol Ther* 1989;12(6):419-427.

6. Mierau D. Manipulation and mobilization of the third meta-carpophylangeal joint: a quantitative radiographic and range of motions study. *Man Med* 1988;3:135-140.
7. Cramer GD, Gregerson DM, Knudsen JT, Hubbard BB, Ustas LM, Cantu JA. The effects of side-posture positioning and spinal adjusting on the lumbar Z joints: a randomized controlled trial with sixty-four subjects. *Spine*. 2002;27(22):2459-66.
8. Suter E, Herzog W, Conway PJ, Zhang Y. Reflex response associated with manipulative treatment of the thoracic spine. *JNMS* 1994;2(3):124-130.

William Meeker, DC, MPH, FICC

Principal Investigator,

Consortial Center for Chiropractic Research

Davenport, Iowa

Click [here](#) for previous articles by William Meeker, DC, MPH, FICC.



Page printed from:

http://www.chiroweb.com/mpacms/dc/article.php?id=46275&no_paginate=true&p_friendly=true&no_b=true