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Full Kinetic Chain Adjusting: Interview with James Brantingham, DC, PhD

Interview by Daniel Redwood, DC

Chiropractors' focus on the spine is enhanced by recognizing the dynamic influence of the legs on the body's overall structural and functional integrity, according to James Brantingham, DC, PhD, Director of Research at Cleveland Chiropractic College—Los Angeles, whose research on chiropractic extremity care has grown deeper and broader since he joined the CCCLA faculty in 2004.

The son of one of California's leading podiatrists, Dr. Brantingham understood from an early age the importance of the feet and legs as a supportive foundation for proper musculoskeletal balance. Following his father's footsteps into podiatry did not spark his enthusiasm, but after spending a day observing at a chiropractor's office—including a memorable case where a patient entered the office barely able to walk and left smiling and pain-free—Brantingham's career direction was clear. After graduation, he practiced in Thousand Oaks, California for 14 years and then followed a winding path that led through chiropractic university programs at Durban University of Technology (DUT) in South Africa, and the University of Surrey in England, where he earned his PhD in clinical research, before returning to California to join the CCCLA faculty.

Most people think of chiropractic as primarily focused on the back and the spine, but there is a long history of chiropractors adjusting the extremities—the arms and legs. How far back in chiropractic history does that extend?

D.D. Palmer's earliest pamphlets, which predate his 1906 and 1910 texts, described adjusting the foot. I looked into these with [chiropractic historian] Joe Keating. Palmer was talking about, at a minimum, adjusting the foot and ankle.¹ He demonstrated a great interest in this. At the same time, *Modernized Chiropractic*, the reputed first 1906 chiropractic textbook by Smith, Paxson and Langworthy, had a full chapter devoted to adjusting the foot.² Looking at Palmer's 1906 and 1910 textbooks, we can make a reasonable attempt to determine the specific conditions to which he was applying the foot adjustments.

These appear to include, at a minimum, a sprained or subluxated hip, sprained or subluxated knee (actually a proximal fibulotibial problem), metatarsalgia, Morton's metatarsalgia or neuroma, or a pinched nerve in the forefoot, and what we now commonly call "plantar fasciitis" or "fasciopathy."³ He also talks about adjusting the shoulder, the hand and the ribs.³ When I did a paper on D.D. Palmer and extremity adjusting, I found over 22 references to adjusting the foot, particularly the great toe or hallux, other foot joints and the ankle for a variety of disorders and pain.^{4,5}

Foot and ankle problems can have their source at the foot and ankle. But in some cases, these can be secondary effects of a problem in the spine. In my experience, causation can go in either direction—the spine causing a foot problem or the feet causing a spinal problem. Could you please describe your concept of "full kinetic chain chiropractic care."

There is clearly a tie-in to the full kinetic chain and there's research supporting this. Iverson, a physiotherapist, did a recent study on generalized adjustments of the lumbosacral spine, and determined that if the hip was stiffer on one side and the patient had patellofemoral pain syndrome (knee pain), then that was a clinical predictor for adjusting the lumbosacral spine on the same side, which would relieve knee pain. Souter did a similar study for anterior knee pain, which is another name for the same condition. This paper won an award at a World Federation of Chiropractic conference and clearly showed that knee pain was relieved by adjusting the lumbosacral spine. So that's a clear tie-in. Other

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studies have shown that when patients have knee osteoarthritis, it makes the disability of hip osteoarthritis worse. Still other research shows that in patients with hip osteoarthritis and knee disability, the stiffness in the knee makes the hip osteoarthritis worse.

So if a practitioner specializes strictly on certain areas of the musculoskeletal system—just the leg or just the spine—they might in some cases fail to address all of the causal factors underlying the patient's pain or other problems.

Absolutely. Researchers have correlated restricted ankle dorsiflexion with knee pain. From a biomechanical point of view, it's pretty simple and straightforward. If you've got a hip problem and also a knee problem, addressing the hip problem but failing to address the knee problem (for example, pain plus loss of knee range of motion) is probably not going to bring as high a level of relief as addressing both of them, and the spine as well. The physical therapists appear to have accepted this concept. Deyle et al's (2005) large study on knee osteoarthritis is one that used full kinetic chain adjusting to manage knee OA.⁶ This included manipulative therapy of the knee but also the ankle, foot, hip or lumbosacral spine.⁶ There has also been research correlating restricted hip pain and lumbosacral pain and it appears that restricted hip motion may be an indicator for adjusting the lumbosacral spine.⁷ Of course, you want to address the hip directly, as well.

What can you tell us about studies that you personally have undertaken regarding chiropractic adjusting for lower extremity disorders?

In 1996, I was hired by Durban University of Technology in South Africa to work in the clinic and to supervise masters of science degree students. I was helping students run all sorts of small trials. They asked me for research ideas and I mentioned a variety of areas that had not previously been studied.

This sounds like a researcher's dream, having all of your potential studies pursued by enthusiastic grad students.

Every student there was required to do a research project. For example, Justin Pellow did a small trial on adjusting the ankle for inversion sprain. We published it in the *Journal of Manipulative and Physiological Therapeutics* in 2001, the first randomized controlled trial of adjusting the ankle for inversion sprain in the history of chiropractic.⁸

What did he find?

That adjusting was superior to placebo. It was well done but a pilot study (with weaknesses inherent in a small intramurally or minimally funded study) so you can't overly generalize.

But it's a necessary first step.

Yes, it's a beginning. Also, you have to remember that these studies were done for around the equivalent of \$1000 U.S. Virtually nothing.

That sounds quite cost effective.

There are strengths and also weaknesses in these small studies, but they are a very important starting point. I think it would be very helpful to have a portion of chiropractic research funds targeted at small studies like these and donations directly to the Department of Research at CCCLA would allow for a variety of small pilot prospective

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case series and studies to collect data and determine feasibility which could lead to attempts by CCCLA to obtain significant funding (such as NIH or NCCAM grants) and the conducting of large definitive trials. However, although chiropractic extremity research is growing, much more of the research in extremity disorders is now coming from the physical therapists.⁹ Immediately after the ankle inversion study I mentioned, a PT named Green did a study on manipulation for acute ankle inversion sprain and found that adding manipulation to a RICE (rest, ice, compression and elevation) protocol was more effective than RICE alone for decreasing pain and increasing dorsiflexion. We've done some other foot studies since that time, as have the PTs and the osteopaths.¹⁰

Also at Durban, students did the first two studies published in the peer reviewed literature, on chiropractic care for the treatment of patellofemoral pain syndrome.⁹ At CCCLA and DUT, the first two chiropractic RCTs for the treatment of shoulder impingement syndrome and rotator cuff tendinopathy were completed, underwent peer review and were published.^{11,12} Another shoulder study from the University of Surrey in Guildford, England was also been recently jointly published with CCCLA. We have another bunion study from the University of Johannesburg, a joint CCCLA-UJ project, that we hope to submit and have published fairly soon.

I began work on my PhD and later received a doctorate in clinical research from the University of Surrey in 2005, finishing the final work on that dissertation and degree while at Cleveland Chiropractic College-Los Angeles. Dr. Gary Globe was very helpful in giving me the extra time I needed to work on it.

What is some of the more recent research you've worked on, including in the past few years at Cleveland?

We recently completed a feasibility study on patellofemoral pain syndrome.

A feasibility study is one in which you are determining whether a larger trial makes sense to pursue, whether you're properly set up for it, that sort of thing.

Yes. Specifically, it compares two chiropractic protocols for patellofemoral pain syndrome. We did this with intramural funding, using a combination of doctors and highly trained interns. Although it was a feasibility study, in fact it had every component of a randomized controlled trial. The two groups were randomized by computer. We had blind assessors. This was done with minimal intramural funding; we did not pay patients anything to defray travel, time, effort or expense as well-funded studies generally do. Despite that, I am very pleased with how it turned out. The outcomes appear encouraging and this feasibility study suggests that a larger trial is justified.¹³

So you are hoping to expand from that feasibility study into something larger?

That's now a real possibility down the line if funding can be secured (always the question). Right now, we've turned to a couple of other areas. I am highly interested in finishing a study on hip osteoarthritis. I wanted to do a study based on the work of Hoeksma, a PT, who used high-velocity, low-amplitude axial elongation hip traction thrusts with pre and post stretching. Hoeksma has already demonstrated this approach to be superior to general medical care.^{9,14}

In our study, we're going to have one group protocol very similar to the Hoeksma protocol, while the other group will receive that same protocol *plus* additional work on the full kinetic chain. This will include not only hip adjustment but also assessment of the knee, the ankle, and the lumbosacral spine, and adjustment of these areas as indicated by the evaluation.

Regarding the knee, we will be keeping in mind some things we've learned from studies by Deyle et al, Fish et al,

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and Tucker et al regarding knee osteoarthritis such as avoiding any early forced flexion of the knee.^{6,9,15} Of course, I can't make any claims at this point, but we're pleased with how this trial is going. We've got one paper submitted on a prospective, single group pre-test post test design generated from this trial and we hope to shortly submit a similar but larger study to a particular medical journal. The RCT, or trial itself will be completed in a little over a year and we believe we will reach or get close to full sample size, which is 60 per group. I am optimistic about this trial.

It sounds like you are, step-by-step, putting together a body of research on chiropractic care for extremity conditions which can be very important to the future of the profession. I understand that you now have, at various stages of development, research projects studying chiropractic care for shoulder impingement syndrome and lateral epicondylitis (tennis elbow), as well as inversion strain and a few other extremity conditions. This appears to be more than a small niche; it's a key area that hasn't been well explored in chiropractic research yet. Do you see it that way?

Absolutely. For the hip osteoarthritis study, we got a \$100,000 grant from Unihealth Foundation*. CCCLA and I are very grateful for that grant, which has made an incredible difference. We are also planning other extremity studies and are about to submit a grant proposal to NIH. One group will get full kinetic chain adjustive therapy and rehab (including exercise and soft tissue treatment). This will be compared to "standard care," or rehabilitation only, consisting of methods (strengthening and stretching exercises) that have already been demonstrated superior to placebo. I think this has the potential to be a very important study. We are hopeful that it will demonstrate the efficacy of chiropractic care.

Is there anything else that you'd like to add?

Yes, I am very grateful to have had, and to have the opportunity to be helpful to our patients and the profession in doing research at CCCLA and previously at these other fine schools, to help improve patient care and outcomes.

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