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UNITED CHIROPRACTIC ASSOCIATION

Research, Information, Advice & Inspiration for Tomorrow's Chiropractor

Welcome to **Evidence Based Practice,** Issue 1/2011, the Student Newsletter from the UCA.

We hope to offer you insights into life in practice from an evidence based standpoint, inform you of the thrills of wellness chiropractic and inspire you to a great life ahead as a Chiropractor.

We will also take the opportunity to inform you of up and coming events that may interest you and enhance your experience as a student and Chiropractor in the future.

Forthcoming Events:

- Sat 21st May - CBP Pediatric Adjusting Seminar with Dr Deed Harrison, Hilton Hotel, Heathrow
- Sat 4th Jun - Brett Axelrod Seminar, Heathrow
- Sat 15th/Sun 16th Oct - Chiropractic Essentials with many International Speakers - Hilton Hotel, Birmingham

* The UCA offers Student Sponsorship to all UCA run events. Contact the UCA office as numbers are limited.

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A Four-Dimensional Model of Vertebral Subluxation

By Christopher Kent DC

Vertebral subluxation represents the heart and soul of chiropractic, yet to many chiropractors, it remains a clinical conundrum. I believe that the controversy and confusion surrounding the chiropractic concept of vertebral subluxation is due, in part, to the lack of an operational definition compatible with most techniques.

A review of models of vertebral subluxation has been published elsewhere.[1] However, regardless of the elegance of a theoretical model, it must be capable of being operationalized if it is to be used to develop clinical strategies. The four-dimensional model was developed as an initial step in the operational definition of vertebral subluxation. It incorporates traditional chiropractic constructs and serves as a bridge to contemporary technology.

The First Dimension

The traditional safety-pin cycle (SPC) consists of the transmission of afferent information from the tissue cell (periphery) to the brain cell (epiphery) on one side, and on the efferent side, from brain cell to tissue cell.[2] In the 4-D model, the first dimension is *dysafferentation*, representing the afferent portion of the SPC. Aberrant afferent input to the CNS may result in qualitatively and/or quantitatively inappropriate responses to changes in the internal or external environment.1 In the contemporary jargon of the computer industry, there is "garbage in - garbage out." Dr. Fred Barge, in his book *One Cause, One Cure*, stated that the cause of disease is "The body's inability to comprehend itself and/or its environment."[3] Such "comprehension" is dependent upon interference -free afferent input.

Dye[4] quoted remarks, attributed to B.J. Palmer in August 1935, which express this concept, noting the result of an adjustment: "[T]he restoration of the normal transmission of mental brain may receive correct, accurate, exact messages as to the external conditions existing at the periphery so that it may direct either the necessary reparative forces or the necessary cooperative forces from that the tissues may be repaired or that the organ or structure may be properly directed that it may perform the normal functioning desired and indicated by the incoming message from me part without."

The authors of the remarkable book *Segmental Neuropathy*, published by Canadian Memorial Chiropractic College, proposed the concept of a "neural image," dependent upon the integrity of neural receptors and afferent pathways. This "neural image" is a representation of the organism's perception of the external and internal environment. If afferent input is compromised, efferent response may be qualitatively and quantitatively compromised.[5]

The clinical implications of aberrant or suboptimal afferent go beyond short-term homeostatic regulation. Dysafferentation may result in anatomical and functional changes in the brain itself. Merzenich[6] noted, "The brain was constructed to change." This challenge to the conventional world view that the mature adult brain is stable and unchanging, the only exception being the death of brain cells, has profound implications for the chiropractor. Gage[7] stated, "Researchers first demonstrated that the central nervous systems of mammals contain some innate regenerative properties in the 1960s and 1970s, when several groups showed that axons, or main branches, of neurons in the adult brain and spinal cord can regrow to some extent after injury." The ability of the brain to change both anatomically and functionally is known as *neuroplasticity.* Three types have been described:[8]

- *Experience-independent* plasticity refers to changes which are not the result of environmental changes or influence.
- *Experience-expectant* plasticity occurs

when the brain uses input from the external envi-

A Four-Dimensional Model of Vertebral Subluxation cont

ronment to effect normal developmental changes in its structure.

- *Experience-dependent* plasticity is when a modification to the internal or external environment produces change in a feature of the brain.

Holloway[6] explained how the brain reconfigures itself and the implications of doing so: "Change the input, be it a behavior, a mental exercise ... or a physical skill and the brain changes accordingly. Magnetic resonance imaging machines reveal the new map: different regions light up ... [T]he brain can be extensively remodeled throughout the course of one's life, without drugs, without surgery. Regions of the brain can be taught to do different tasks if need be ... This sort of thing will be a part of normal future life ... healing plasticity can be driven by behaviour."

The 2nd-4th Dimensions

The remaining three dimensions represent the efferent portion of the safety-pin cycle. Each component may be reliably measured. These measurements provide objective evidence concerning manifestations of vertebral subluxation. The three components are:

Dyskinesia. Dyskinesia refers to distortion or impairment of voluntary movement.9 Spinal motion may be reliably measured using inclinometry.[10] Alterations in regional ranges of motion are associated with vertebral subluxation.[11]

Dysponesis. Dysponesis is abnormal involuntary muscle activity. Dysponesis refers to a reversible physiopathologic state, consisting of errors in energy expenditure which are capable of producing functional disorders. Dysponesis consists mainly of covert errors in action potential output from the motor and premotor areas of the cortex and the consequences of that output. These neurophysiological reactions may result from responses to environmental events, bodily sensations, and emotions. The resulting aberrant muscle activity may be evaluated using surface electrode techniques.[12] Typically, static surface electromyography (SMEG) with axial loading is used to evaluate innate responses to gravitational stress.[13]

Dysautronomia. The autonomic nervous system regulates the actions of organs, glands, and blood vessels. Acquired dysautonomia may be associated with a broad array of functional abnormalities.[14-19] Autonomic dystonia may be evaluated by measuring skin temperature differentials.[20] Uematsu, et al., determined normative values for skin temperature differences based upon asymptomatic "normal" individuals. The authors stated, "These values can be used as a standard in assessment of sympathetic nerve function, and the degree of asymmetry is a quantifiable indicator of dysfunction ... Deviations from the normal values will allow suspicion of neurological pathology to be quantitated and therefore periphery so that it may direct either the necessary reparative forces or the necessary cooperative forces from that the tissues may be repaired or that the organ or structure may be properly can improve assessment and lead to proper clinical management."[21] Skin temperature differentials are associated with vertebral subluxation.[22] Autonomic tone and balance may also be evaluated by measuring heart rate variability.[23]

This four-dimensional model may be used with any technique which has, as its objective, the detection, management or correction of vertebral subluxation. Correction or reduction of vertebral subluxation facilitates the restoration of proper tone throughout the nervous system. Alterations in the tone of the somatic system may be objectively evaluated using surface EMG. Altered autonomic tone may be evaluated using skin temperature measurements. Changes in ranges of motion may be measured to assess dyskinesia. Such objective assessments have the potential to make chiropractic the dominant strategy of 21st century health care.

A Four-Dimensional Model of Vertebral Subluxation cont:

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Quantifying Wellness

By Donald M. Petersen Jr., BS, HCD(hc), FICC (h), Publisher

An interesting study came across my desk recently.[1] What makes this paper interesting is the effort on the part of the authors to "explore the value of using more holistic outcomes measures when evaluating treatments for back pain." Needless to say, chiropractic care was included in their evaluation.

The authors examined several studies that focused on "nontraditional outcomes that capture treatment effects." While perhaps insignificant to some, I believe this area of study will lead us to a greater understanding of wellness and provide clues as to how the chiropractic adjustment impacts health on levels not considered by most.

Of the 11 "holistic outcome measures" identified for all forms of "CAM," chiropractic care elicited six from respondents:

Options = Hope: Thirteen percent of patients who received chiropractic care felt it provided options that made them feel hopeful. The authors noted that "some participants stated that having this new option meant that they no longer had to use pain medication or consider surgery." Patients expressed that they were "hopeful and confident about their own ability to affect their condition."

Positive Changes in Emotional State: Thirteen percent of chiropractic patients also experienced positive emotional changes; "the most frequently mentioned effect was reduced stress and worry." "Other emotional changes included a generally improved psychologic state, being happier or more cheerful, feeling more control over emotional responses to pain and other stressful circumstances, and a greater sense of physical and mental balance."

Relaxation: Four percent of people who received chiropractic care reported an "increased ability to relax." The feeling of relaxation was focused in specific areas of the body for some patients while a general feeling of relaxation was cited by others.

Increased Body Awareness: Four percent of patients stated that chiropractic also"increased their awareness of their bodies." Some expressed that chiropractic made them aware of "when pain begins, what causes it, and what one can do about it." "In other cases, respondents described a deeper sense of being in touch with and listening to the body; one referred to it as 'awakening.'"

Changes in Thinking: Four percent of chiropractic patients also noticed that they had changes in their thinking that increased their ability to cope with their back pain. Some experienced "a changed philosophy or consciousness or a more positive attitude."

- **Well-Being:** Four percent of those who experienced chiropractic care also experienced a greater sense of well-being. As one patient noted: "I thought it contributed to an overall sense of well-being."

When we combine these outcomes, we see that (according to this group of studies) it is not unusual for chiropractic patients to experience increased bodily awareness, positive emotional changes and a greater sense of well-being. One can only begin to hypothesize about the physiologic changes that occur in the bodies of adjusted patients that evoke these outcomes.

While these outcomes are not news to you, the doctor or student of chiropractic, they are just beginning to be considered by the non-chiropractic research community. More research will undoubtedly uncover more positive outcomes. Imagine what we could learn if only 1 percent of the money that is currently wasted on drug research could be spent on wellness research!

Quantifying Wellness cont

These studies set the stage for more discovery and understanding about the effects of the chiropractic adjustment beyond the musculoskeletal. What you see in your clinic is now beginning to be measured and quantified.

Given the above, we should not be shy about sharing chiropractic's potential holistic benefits with our patients and community. Studies like these can help underscore just how powerful an adjustment can be.

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Manipulation or microdiskectomy for sciatica? A prospective randomized clinical study.

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Manipulation or microdiskectomy for sciatica? A prospective randomized clinical study.

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Abstract

OBJECTIVE: The purpose of this study was to compare the clinical efficacy of spinal manipulation against microdiskectomy in patients with sciatica secondary to lumbar disk herniation (LDH).

METHODS: One hundred twenty patients presenting through elective referral by primary care physicians to neurosurgical spine surgeons were consecutively screened for symptoms of unilateral lumbar radiculopathy secondary to LDH at L3-4, L4-5, or L5-S1. Forty consecutive consenting patients who met inclusion criteria (patients must have failed at least 3 months of nonoperative management including treatment with analgesics, lifestyle modification, physiotherapy, massage therapy, and/or acupuncture) were randomized to either surgical microdiskectomy or standardized chiropractic spinal manipulation. Crossover to the alternate treatment was allowed after 3 months.

RESULTS: Significant improvement in both treatment groups compared to baseline scores over time was observed in all outcome measures. After 1 year, follow-up intent-to-treat analysis did not reveal a difference in outcome based on the original treatment received. However, 3 patients crossed over from surgery to spinal manipulation and failed to gain further improvement. Eight patients crossed from spinal manipulation to surgery and improved to the same degree as their primary surgical counterparts.

CONCLUSIONS: Sixty percent of patients with sciatica who had failed other medical management benefited from spinal manipulation to the same degree as if they underwent surgical intervention. Of 40% left unsatisfied, subsequent surgical intervention confers excellent outcome. Patients with symptomatic LDH failing medical management should consider spinal manipulation followed by surgery if warranted

Curry - new weapon in the war on Alzheimer's

Eating a weekly curry can help prevent the onset of Alzheimer's researchers claim

It probably won't be our main priority when deciding what takeaway to order.

But curries - so often criticised by advocates of healthy eating - may protect against Alzheimer's disease. Eating a curry two or three times a week could help prevent the onset of Alzheimer's and other forms of dementia, an expert said yesterday.

According to Professor Murali Doraiswamy, the magic ingredient is curcumin, a component of the spice turmeric. Curcumin prevents the spread of harmful amyloid plaques found in the brain of Alzheimer's sufferers, he said. These plaques are thought to play a key role in symptoms such as memory loss and mental impairment. Professor Doraiswamy, who grew up in the southern Indian city of Madras , which is famous for its fiery curries, said: 'There is very solid evidence that curcumin binds to plaques, and basic research on animals engineered to produce human amyloid plaques has shown benefits

'Turmeric has been studied not just in Alzheimer's research but for a variety of conditions, such as cancer and arthritis

Turmeric is often referred to as the spice of life in ancient Indian medical lore.' A trial is under way at the University of California , Los Angeles , to test curcumin's effects in Alzheimer's patients and specifically on amyloid plaque proteins.

Scientists say the spices in curry, including curcumin, a component of the spice turmeric, can help memory

Similar research is about to start at Southampton University, although some British experts suggested that large amounts of curry would have to be eaten to counteract some of the brain changes that are characteristic of Alzheimer's.

Professor Doraiswamy, of the Department of Psychiatry, at Duke University Medical Centre, in Durham , North Carolina , said human studies will build on laboratory research.

He told delegates at the Royal College of Psychiatrists' annual meeting in Liverpool : 'You can modify a mouse so that at about 12 months its brain is riddled with plaques. If you feed the rodent a curcuminrich diet it dissolves these plaques

He added: 'Studies looking at populations show that people who eat a curry meal two or three times a week seem to have a lower risk for dementia.' Turmeric is also found in mustard and Professor Doraiswamy predicted a day when those unable, or unwilling, to eat curries might be advised to take a daily 'curry pill'.

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