

## January 2003

### Are Medical Undergraduates Being Taught Chiropractic in North American Medical Schools?

The teaching of so called Complementary and Alternate Medicine (CAM), in which many authors include chiropractic, seems to have become the norm in the undergraduate curriculum of US medical schools.

A study published in 1997, based on data collected in 1995, by Carlston et al, found that relaxation techniques, acupuncture, biofeedback, chiropractic and hypnosis were the top 5 CAM topics and that CAM was being taught in at least 33 different medical schools in the US. Wetzel et al. found during 1997-8 that out of the total 125 medical schools in the US at least 75 (60%) were teaching so called CAM topics either as stand-alone elective courses or as part of required courses. A Canadian study (Ruedy et al., 1999) that was based on data collected in 1998 showed that 81 % of Canadian medical schools were teaching CAM topics at that time.

A more recent US based survey, published in 2002 (Brokaw JJ, et al., 2002) was based on data collected in 2000 and suggests that the trend is continuing to grow. Unlike previous surveys the aim of the present survey was not designed to estimate the prevalence of CAM instruction among all 125 US medical schools, but rather to document the form, content, and purpose of such training in a substantial subset (53) of those schools.

What the authors found shows that medical schools are continuing to foster the integration of CAM's into everyday medical practice. In relation to chiropractic the authors found that 60.3% of the CAM course directors at 53 different US medical schools were teaching chiropractic. Furthermore, although most of the respondents (61.6%) taught courses whose primary objective was to provide students with a broad survey of CAM and its diversity, almost a fifth (17.8%) had the principal course objective of providing practical training in the use of specific CAM treatments.

The results of one RCT (Curtis P, et al, 2000), are worth considering at this point. Although the study is not directly related to the teaching of medical students, it did examine whether training primary care physicians in techniques of limited manual therapy would result in improved outcomes for their patients with acute low back pain. The authors concluded that the "addition of limited manual therapy (to the training of physicians) offers little extra benefit."

A recent survey (Greenfield SM, et al., 2002) carried out amongst first year medical students in the UK is also of relevance to this discussion. The survey was designed to explore first year medical students' rating of CAM therapies following a core teaching

session. One hundred and fifty (71.0%) students completed a self-administered questionnaire. Following the teaching session students rated therapies observed on a 10- point scale, 1 (extremely sceptical) to 10 (totally convinced). The highest rated was chiropractic (median score = 8), lowest, reflexology (median score = 5.06). The authors state that a short CAM teaching session early in the curriculum of medical students can inform students about the relationship of CAM with current medical practice.

#### **References:**

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- Ruedy J, Kaufman DM, MacLeod H. *Can Med Assoc J.* 1999;160:816-17.
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- Curtis P, Carey TS, Evans P, Rowane MP, Garrett JM, Jackman A. *Spine* 2000;25:2954-61.
- Greenfield SM, Innes MA, Allan TF, Wearn AM. *Complement Ther Med* 2002;10:27-32

#### **Attitude toward vaccination: a survey of Canadian chiropractic students**

The official stance of the Canadian Chiropractic Association is pro-vaccination. Despite that, vaccination remains a contentious issue for a significant part of the chiropractic profession in Canada and around the globe. Although the prevalence of anti-vaccination views within the chiropractic profession is unknown, preliminary investigations suggest that somewhere between 7-30% (1-3) of the profession may have negative views regarding vaccination.

The authors of this study (1) set out to investigate the attitudes of Canadian chiropractic students towards vaccination. The subjects for the study were students attending the Canadian Memorial Chiropractic College (CMCC) during the 1999/2000 academic years.

An 11-item questionnaire focused on attitudes towards vaccination was distributed to chiropractic students in all 4 years at CMCC. The response rate was 75.2% (467 out of 621).

Almost a third (29.4%) of chiropractic students had anti-vaccination views and the proportion of respondents who stated they were against vaccination increased as students progressed through the CMCC program.

#### **Reference:**

- (1) Busse JW, Kulkarni AV, Campbell JB, Injeyan HS. *Can Med Assoc J.* 2002;166:1531-4.
- (2) Colley F, Haas M. *JMPT* 1994;17:584-90.
- (3) Lee ACC, Li DH, Kemper KJ. *Arch Pediatr Adolesc Med* 2000;154:401-7.

## Is Nature Trying to Tell us Something?

The following question was recently posed on the cover of New Scientist (13 April, 2002):

**“How can a single law govern our sex lives, the proteins in our bodies, movie stars and supercool atoms?”**

In the last 3 years a professor of physics at the University of Notre Dame in Indiana has made a discovery that has startling ramifications for a diversity of fields like ecology, molecular biology, computer science and quantum physics. In fact, it has been suggested that Albert-Laszlo Barabasi's findings might even transform the way that most of western society views the world.

Back in 1998 Barabasi and his colleagues started modeling complex networks by exploring the structure of the World-wide Web. They sent a software robot crawling around the Web to analyze the links between websites. When they started to look at the architecture of the web and plot the distribution of links between sites they found something other than the normal bell curve they expected - they quickly realised they were looking at a more complex situation than that capable of being described by random networks.

They found that the structure of the Web was dominated by a few highly connected sites (labeled 'hubs'), that have developed because they offer users shortcuts to information. The result is that it takes only a few clicks to get from one site to any other and even if the Web grows another 1000% it will still be easy to navigate.

Barabaski writes, "We are witnessing a revolution in the making as scientists from all different disciplines discover that complexity has a strict architecture".

These networks do not operate at random, the author contends; there are laws that govern their behavior. Other scale-free networks include the electrical power grid, Al Qaeda terrorist cells, and companies/consumers linked by trade. Furthermore, of particular relevance to us as chiropractors is the observation made by Barabaski and his colleagues that the nervous system of a living creature is also a scale-free network.

Conceptualising the nervous system from the perspective of a scale-free network may provide new insights into how the dysafferentation arising from a subluxated vertebra might have either widespread or limited implications for an organism's adaptive capacity.

David Cohen, author of the New Scientist article about Barabaski's findings, concluded by writing, "Scale-free networks give us the beginnings of a mathematical way to study the relationship between individuals and large-scale behaviour".

In response to the question posed on the cover of New Scientist the editors simply responded:

**“Nature is telling us something.....”**

Professor Barabasi's new book, is titled "**Linked: The New Science of Networks**" in the US (Perseus Nexus Publishing, US\$26.00). In Britain it is called "**Small Worlds**" and is published by Weidenfeld & Nicolson.

## Does autonomic nervous system balance determine survival in centenarians?

It has been found that healthy centenarians often have better anthropometric, endocrine, metabolic and immunological parameters than aged subjects (> 75 years old). It has been hypothesized that differences in autonomic nervous system activity could represent one of

a cluster of factors explaining the extreme survival of centenarians. However, it is not known whether there are any differences in autonomic nervous system activity between aged subjects and healthy centenarians. These issues may be of interest to the chiropractic profession as it has been hypothesized that vertebral subluxations may have a deleterious effect on the balance of the different components of the Autonomic Nervous System (ANS)

The authors of a paper published in 1999 aimed to answer the following question: **Is there any difference in baseline heart rate variability (HRV) parameters between aged subjects and healthy centenarians?**

The authors proceeded by investigating power spectral analysis of HRV at baseline in 25 aged subjects (age 75 years) and 30 healthy centenarians (age 100 years). Anthropometric measurements were made in all subjects, fasting blood samples were drawn for metabolite determinations, and HRV was determined.

Healthy centenarians had lower basal values for total power and the low-frequency (LF) component and a higher value for the high-frequency (HF) component ( $P < 0.05$ ) than aged subjects. As a result the low-frequency/high-frequency ratio (LF/HF) ( $P < 0.02$ ) was also lower in the healthy centenarians than in the aged subjects.

The authors concluded that their study demonstrates that the basal LF/HF ratio, an indirect index of cardiac sympathovagal balance, is lower in healthy centenarians than in aged subjects.

Similarly Shimizu K, et al. studied the significance of heart rate variability for survival in the extremely old. In 1992, the authors assessed the activities of daily living, cognitive function, and nutritional status of 27 centenarians. At that time the participants had no disease and in addition to assessing the above factors that authors collected data related to the power of the heart rate variability in the ultralow, very low, low (LF), and high frequency (HF) bands.

In 1996, the authors assessed survival in the participating centenarians; 17 had died and 10 were still living. Logistic regression analysis using backward elimination detected three factors that independently influenced mortality - dementia, sympathetic nerve activity represented by LF/HF, and age.

Mortality risk increased with greater age back in 1992, more severe dementia, or lower LF/HF. The authors concluded that sympathetic nerve activity maybe associated with prognosis for survival in centenarians.

#### **Reference:**

Shimizu K, Arai Y, Hirose N, Yonemoto T, Wakida Y. Prognostic significance of heart rate variability in centenarians. *Clinical Experimental Hypertension* 2002;24:91-7.

## Can cranial manipulation affect the autonomic nervous system?

One of the most consistent points of contention with regard to the cranial system has been the nature of the cranial rhythmic impulse (CRI). The CRI was in the past considered by many to be an independent rhythm occurring at a frequency similar to that of respiration (6- 14 cycles/min). It was commonly assumed that this rhythmic motion was mechanically driven by variations in the pressure of the cerebrospinal fluid system and that it could be felt synchronously all over the body (Upledger & Vreedevoogt 1983). However, recent statistical comparisons have demonstrated that the primary respiratory mechanism (PRM), as manifested by the (CRI), is palpably concomitant with the low-frequency fluctuations of the Traube-Hering-Mayer (THM) oscillation as measured with a laser-Doppler flowmeter (1). (Note; In other words, the 'primary respiratory mechanism' of cranial motion is now seen as a secondary effect of rhythmic changes within the blood vessels of the brain and rest of the body).

A new study (2) has suggested that cranial manipulation is able to modify blood-flow velocity oscillation in its low-frequency Traube-Hering-Mayer components. The authors of the study set out with the objective of determining the effect of cranial manipulation on the Traube-Hering-Mayer oscillation. Of the 23 healthy participants, 13 received a sham treatment and 10 received cranial manipulation. A laser-Doppler flowmetry probe was placed on the left earlobe of each subject to obtain a 5-min baseline blood-flow velocity record. Cranial manipulation, consisting of equilibration of the global cranial motion pattern and the craniocervical junction, was then applied for 10 to 20 minutes. The sham treatment was palpation only.

Immediately following the procedures, a 5-min post-treatment laser-Doppler recording was acquired and the pre-treatment and post-treatment data were compared. The 10 participants who received cranial treatment showed a thermal signal power decrease from 47.79 dB to 38.49 dB ( $P < .001$ ) and the baro signal increased from 47.40dB to 51.30 dB ( $P < .021$ ).

The authors conclude that, because the low-frequency oscillations are mediated through parasympathetic and sympathetic activity, cranial manipulation affects the autonomic nervous system.

### **References:**

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2. Sergueef N, Nelson KE, Glonek T. The effect of cranial manipulation on the TraubeHering-Mayer oscillation as measured by laser-Doppler flowmetry. *Altern Ther Health Med.* 2002;8:74-6.

### **Much of Medicine remains Empirical**

The following are three quotes from a paper recently published in the *BMJ* titled - Unwarranted variations in healthcare delivery: implications for academic medical centers. *BMJ* 2002;325:961-4.

**Quote** - "Academic medicine has had only limited success in improving the scientific basis of everyday clinical practice, even within the walls of its own hospitals. Patterns of practice among academic medical centers as among other institutions are often idiosyncratic and unscientific, and local medical opinion and local supply of resources are more important than science in determining how medical care is delivered. In short, after nearly 100 years of academic medicine as we know it, much of medicine in the United States remains empirical".

**Quote** - "What must academic medical centers do to reclaim the authority of clinical science as the arbiter of the efficiency and effectiveness of supply-sensitive services? The first step is to acknowledge that their own patterns of practice in managing chronic illness provide no gold standard for excellence".

**Quote** - "Although research projects conducted over the past 20 years provide successful examples of reducing under-service, improving patient safety, reducing scientific uncertainty, and improving the scientific and ethical basis for informed patient choice, these successes have not yet had much impact on the patterns of practice in the United States, even among academic medical centers".

### **Reliability and validity of a Kinesiology muscle test.**

Ludtke R, Kunz B, Seeber N, Ring J. Reliability and validity of the Kinesiology muscle test. *Complementary Therapies in Medicine*. 2001;**9**:141-5.

This randomized, double-blind, placebo-controlled study examined the test-retest reliability and validity of kinesiology muscle testing when used as a method of identifying a substance (wasp venom) known to be an allergen to a particular group of patients.

Included in the study were seven patients who were allergic to wasp venom, as confirmed by clinical and laboratory tests, and four Health Kinesiology practitioners (examiners).

Using the anterior deltoid as the indicator muscle for each patient, the examiners tested each patient's 'sensitivity' towards the substance contained in each of 20 bottles (10 bottles containing placebo and 10 contained venom). 'Sensitivity' was indicated by a weak muscle hold while 'not sensitive' (normal) was indicated by a stable hold.

Analysis of the results showed the kinesiology test to be unreliable as a method of identifying the allergenic substance ( $\kappa=0.03$ ). The method was estimated to have a sensitivity of 40% and specificity of 60%.

It was concluded that the use of Health Kinesiology as a diagnostic tool appeared to be no more effective than random guessing.

### **Impact of direct to consumer drug advertising in the US continues to grow**

According to a recent survey of 500 adults in the US (Feb, 2002), conducted by online marketing research company *InsightExpress*, one in three adults has asked their doctor about a medication they saw advertised in a television commercial. Furthermore, of those adults who asked their physician about a prescription drug after seeing a related television commercial,

- Twenty three percent (23%) said the ads made them feel like they had the advertised problem, and,
- Seventeen percent (17%) said they'd be willing to pay more for an advertised drug outside their health plan.

On top of that, another study, this time from the National Institute for Health Care Management Foundation, found that patient spending on prescription drugs increased by 17.1 % from 2000 to 2001. That is the fourth year in a row that spending on prescription drugs escalated by 17% or more. The study also found that only a small number of drugs account for the large increase - 50 drugs out of the 9432 drugs available on the retail market account for 62.3% of the \$22.5 billion increase in retail drug spending in 2001.

Antidepressants remained the top-selling drug category in 2001, up by 20.2%, with \$12.5 billion in sales.

### **Can chiropractic care improve quality of life in pediatric patients with chronic asthma?**

Bronfort G, et al. Chronic pediatric asthma and chiropractic spinal manipulation: a prospective clinical series and randomized clinical pilot study. *J Manipulative Physiol Ther.* 2001;24:369-77.

Studies indicate that it is not uncommon for patients with breathing difficulties such as asthma to receive chiropractic care. According to a Danish survey a substantial number of children with chronic asthma receive chiropractic care, and 92% of parents consider this treatment beneficial. A 1998 report of an Australian survey estimated that 1% to 10% of children with asthma receive chiropractic treatment for this condition.

The principal objective of the study by Bronfort et al. was to determine if chiropractic spinal manipulative therapy (SMT) in addition to optimal medical management resulted in clinically important changes in asthma-related outcomes in children.

A total of 36 patients aged 6 to 17 years with mild and moderate persistent asthma were randomly assigned to receive either active SMT or sham SMT in addition to their standardized ongoing medical management.

At the end of the 12-week intervention phase, objective lung function tests and patient-rated day and nighttime symptoms based on diary recordings showed no significant change.

Of the patient-rated measures, a reduction of approximately 20% in 2 bronchodilator use was seen ( $P = .10$ ). The quality of life scores improved by 10% to 28% ( $P < .01$ ), with the activity scale showing the most change. Asthma severity ratings showed a reduction of 39% ( $P < .001$ ), and there was an overall improvement rating corresponding to 50% to 75%.

The authors conclude, "After 3 months of combining chiropractic SMT with optimal medical management for pediatric asthma, the children rated their quality of life substantially higher and their asthma severity substantially lower". "These improvements were maintained at the 1-year follow-up assessment". "There were no important changes in lung function or hyper-responsiveness at any time". "The observed improvements are unlikely to be the result of the specific effects of chiropractic SMT, but other aspects of the clinical encounter that should not be readily dismissed".