

### **Does Chiropractic “Add Years to Life”?** **JCCA 2004; 48(3):217–224.**

#### **To the Editor:**

So there I was, reviewing my upcoming lecture notes for third year students in the Geriatric (or, as I prefer to call it, ‘Healthy Aging’) course at CMCC when I saw with great interest the title of Dr. Morgan’s article in the September 2004 issue of the JCCA.<sup>1</sup> In roughly two weeks time I was going to review the principle theories of the aging process from telomeres to caloric restriction, from superoxidases to comparing aging to Darwinian evolution,<sup>2</sup> and here was an article that might augment, and possibly even provide an interesting perspective, on this topic. Regretfully, my hopes were dashed on the shores of an article with such an unusual study design that it was, in my opinion, unable to successfully answer the question it asked.

Dr. Morgan sought to compare mortality rates of chiropractors (gathered over two different time periods) to the general population and to mortality rates of medical doctors. The mortality rates of chiropractors were drawn from two data pools: 1969 to 1979 and 1990 to 2003 (what I will refer to as the ‘first’ and ‘second’ data pools respectively). Using data gleaned from either Dynamic Chiropractic’s ‘*In Remembrance*’ or ‘*Who’s Who in Chiropractor-a Necrology*’, Dr. Morgan reported that the mortality rate amongst chiropractors was not only lower than that observed in the general male population, it was also lower than the mortality rate reported among medical doctors.

There are several problems with the structure of this study. First, as Dr. Morgan noted, he could only obtain mortality rates from a select few male chiropractors in these two time periods. The problem is that women live, on average, 4 to 10 years longer than their male counterparts.<sup>3</sup> Since this study only had access to the mortality rates of male chiropractors, whereas data from medical doctors undoubtedly had data from both sexes (Dr. Morgan was uncertain on this point) it is not surprising that chiropractic mortality rates would score lower. In fact, it would have gone against every other epidemiological study published in the past 50 years if it had reported any else but.

Another problem was the age of male life expectancy

from the general population Dr. Morgan chose to use as a reference point. Specifically, Dr. Morgan compared the life expectancy of chiropractors (calculated to be 73.4 years and 74.2 years from each data pool respectively) to an average life expectancy of men in the general population of 76.9 years, using a reference from the year 2002.<sup>4</sup> However, since the data gathered from chiropractors covered a 35-year time span, Dr. Morgan could have just as readily used a value of 72.7 years (taken from a 1990 source)<sup>5</sup> or 73 years (taken from a 2000 source).<sup>6</sup> Had he done so, this study would then have had to report that the male chiropractors did, in fact, live longer than their male counterparts from the general population.

Another problem with this study was both the total numbers of deaths among practitioners examined as well as *the time frame over which they were collected*. The total number of chiropractors included in Dr. Morgan’s study, from all the hundreds, (if not thousands) that no doubt died between 1969 and 2003, were 55 from the first data pool and 67 from the second data pool. This represents roughly three persons a year over the 35 years spanned in this study. These numbers were then compared to 530 medical doctor deaths recorded in *only one year* – 1995. In essence, Dr. Morgan may have been trying to draw statistical conclusion based on a practitioner’s age at the time of death of three or so male chiropractors compared to over 500 medical doctors (sexes unknown) in the same year.

One of the greatest problems with Dr. Morgan’s study is that it cannot control for advances in health care made during the time covered by this study. For example, the 55 chiropractors in the first data set died somewhere in the years between 1969 to 1979. Thus, they could not have benefited from the strides made in the fields of diagnosis (CAT scans, MRIs and so on) or treatment (cardiac surgery, cancer therapy, transplantation technology and pharmaceuticals) that medical doctors from the 1990s would have had access to prior to their deaths in 1995. A list of the technologies available to a person in the 1970s compared to a similar list of available technologies in 1995 would indeed be a formidable group of health care options, particularly among those illnesses responsible for the highest rates of mortality: heart disease, cancer, lung disease, stroke and diabetes.

Chiropractors, of course, do not live in isolation. Even if spinal care conveyed oncostatic or antihypertensive

benefits such gains would most likely be obscured not only by lifestyle, but also by an even more omnipresent force. A few years ago, I had the opportunity to attend the 17th Congress of the International Association of Gerontology in Vancouver, BC. One of the keynote speakers was Dr. Thomas B.L Kirkwood, a molecular geneticist recognized as a world expert in the area of the aging process.<sup>7</sup> After taking the audience through the evidence of the more common theories of aging, he then stated that the most important factor that he had found that determines which *individual* in a population lives longer than another individual in the same population, the factor that seems to trump all others, is good old fashion *chance*. Certainly the finding from Dr. Morgan's study, resting on a small number of chiropractors from the gender most likely to shed their mortal coil, roughly half of whom died during a less technologically advanced time in health care as compared to a sample of medical doctors, using arbitrarily chosen statistics from the general population, may easily be attributed to chance alone.

I submit that, as alluded to by Dr. Morgan, a more insightful study would be to monitor qualitative outcomes among persons (perhaps chiropractors) receiving chiropractic care as compared to persons not receiving chiropractic care (perhaps medical doctors), if such a study could be constructed. Thus, rather than look at raw numbers of longevity, it might be more informative if outcome measures included a practitioner's morbidity, abilities to perform both their Activities of Daily Living (ADLs) and Instrumented Activities of Daily Living (IADLs), ability to optimize their level of health and the ability to maintain their independence. In my experience, virtually every expert in the field of geriatric care emphasizes the importance of health promotion and prevention over life span.

I understand the intent of Dr. Morgan's study, to challenge what he sees is an oft-quoted adage emanating from within some chiropractic circles. Not unlike a study by Grod et al.,<sup>8</sup> unsubstantiated claims made within the profession must be challenged for their veracity, and perhaps the claim that chiropractic care can purportedly prolong life is such a claim. Unfortunately, it seems to me that this study did not, and could not, answer the question it meant to answer.

Respectfully submitted,

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Associate Professor, Canadian Memorial Chiropractic College

### References

- 1 Morgan L. Does chiropractic 'add years to life'? J Can Chiro Assoc 2004; 48(3):217-224.
- 2 Gleberzon BJ. Theories of aging. In: Chiropractic care of the older patient, 1st edition. (Ed: BJ Gleberzon). Oxford, UK. Butterworth-Heinemann 2001:37-45.
- 3 Gleberzon BJ. Geriatric demographics. In: Chiropractic care of the older patient, 1st ed. (Ed: BJ Gleberzon). Oxford, UK. Butterworth-Heinemann 2001:14-21.
- 4 Staff, Final 2000 Mortality Statistics. 2002, National Center for Human Services, Atlanta.
- 5 Wachtel TJ. Biology, epidemiology and demographics of aging: Life expectancy. In: Practical guide to the care of the geriatric patient, 2nd edition. (Ed: FF Ferri, MD Fretwell and TJ Wachtel). St. Louis, MI. Mosby-Year Book Inc. 1997:14.
- 6 Havlick RJ. Demographics. In: Merck Manual of Geriatrics (third edition). Merck Research Laboratories (Merck & Co. Inc)(Ed: Beers MH, Berkow R). Whitehouse Station, NJ. 2000; 12.
- 7 Kirkwood BLT. Keynote address. 17th Congress of the International Association of Gerontology (IAG), July 3, 2001, Vancouver, BC.
- 8 Grod JP, Sikorski D, Keating JC Jr. Unsubstantiated claims in patient brochures from the largest state, provincial, and national chiropractic associations and research agencies. J Manipulative Physiol Ther 2001; 24(8):105-116.

### To the Editor in reply:

I thank Dr. Gleberzon for making the effort to critique the recent study in the JCCA exploring the question of whether 'chiropractic adds years to life.'<sup>1</sup>

Dr. Gleberzon expressed concern that inclusion of females in the mean age at death computation for medical doctors would unreasonably skew their mortality figures higher. Dr. Gleberzon is correct that females do live longer on average than males, but that is not at issue. While today female medical school enrollment can easily be 50% or more such was not the case 50 years ago.<sup>2</sup> Dr. Gleberzon forgets that medical physicians who are dying of old age today entered practice in the 1940's and 1950's at a time when female medical school enrollment was miniscule. Thus I disagree with Dr. Gleberzon, and feel it is reasonable to state that female gender influence in calcu-

lating the mean age at death of physicians dying today is minimal.

Dr. Gleberzon took issue with the choice of a year 2000 (not 2002, as Dr. Gleberzon claimed) as a reference point for mean age at death of the general population. To address this concern I extracted mortality data from *Dynamic Chiropractic* for chiropractic deaths from 1998 to 2003, effectively ‘straddling’ the year 2000 reference point, for a closer comparison. This extraction produced 31 chiropractic names with a mean age at death of 71.3 years and a standard deviation of 13.6. The age at death for this group clustered around the year 2000 reference point is even lower than the chiropractic mortality data of the other two chiropractic groups reported. No matter how you slice the data, chiropractors do not live as long as comparative groups. In fact when we consider that the chiropractic group from 1969–1979 lived an average of 74.2 years, the group from 1990 to 2003 lived an average 73.3 years, and the group from 1998 to 2003 lived an average 71.3 years we must wonder if chiropractic longevity is actually decreasing?

So there I was, scratching my head, as Dr. Gleberzon then launched into a claim of some ‘omnipresent force’ at work, which in this case turned out to be chance. His claim being that chance might explain why the chiropractors included in this study might not live as long. It is common knowledge that if you want to live a long life then it helps, by chance, to have long-lived parents. But this is an *individual* effect, and does not extend to groups made up of random members, as were the groups in the chiropractic study. Dr. Gleberzon is asking us to believe that chance alone would miraculously select out 122 doctors, scattered in time over several years, from all across the country, and then pick only those who would one day be included in a *Dynamic Chiropractic* or *Who Was Who in Chiropractic* obituary, and then arbitrarily end their lives early. Speculation is one thing – but this is contrary to good reason.

Reference was then made by Dr. Gleberzon to studies by Haylick and Kirkwood pointing to a mean age at death for the general population of around 73 years between the years of 1990 and 2000. What Dr. Gleberzon failed to consider is that these figures represent deaths from *all* causes, including suicide, homicide, and accidents. Including these other causes, which mostly occur at younger ages, skews the mean age at death for the general population in these studies to a lower number. When

these other causes of death are factored out the mean age at death in the general population increases substantially. By contrast in the chiropractic study mean ages at death were specifically *only* from those deaths that resulted from *natural causes*.

So it appears we have come full circle, and Dr. Gleberzon has failed to prove his point.

Looking ahead it would certainly be desirable to have studies with more comprehensive mortality data, but until that time comes I submit that the data to date supports the conclusion that chiropractors themselves do not demonstrate a longevity advantage. As was pointed out in the response to Dr. Parker a significant number of the chiropractors included in this mortality study were the top people in the profession, the *crème de la crème* of chiropractic. If top chiropractic leaders are not experiencing longevity benefits from chiropractic care then who will?

It may be well now to ask ‘What factors might be contributing to decreased chiropractic longevity?’ We could ask, for example: Are our elderly chiropractors so ‘fixated’ on the ephemeral ‘subluxation’ as a universal panacea that they are neglecting proven approaches to elderly health care like blood pressure management and influenza immunization?

Lon Morgan, DC, DABCO  
Meridian, Idaho

#### References

- 1 Morgan, L., *Does Chiropractic ‘Add Years to Life’?* JCCA, 2004; 48(3):217–224.
- 2 Colborn, R., *The changing medical student population at the University of Cape Town.* S Afr Med J, 1985; 85(4):256–261.

#### To the Editor:

Reading this article reminded me of a claim contrary to the findings of Dr. Morgan. A few years ago there was a widely distributed audio tape selling minerals entitled “Dead Doctors Don’t Lie” which claimed that the average medical doctor’s life span was 58 years old. A google search on the internet quickly found the web site below designed to debunk this tape’s assertions about the healing powers of minerals. This site (which had an interest

in reporting a high average age of death for medical doctors) quoted the following: "According to Kevin Kenward of the American Medical Association: 'Based on over 210,000 records of deceased physicians, our data indicate the average life-span of a physician is 70.8 years.'" Using this data, chiropractors live 3 years longer than medical doctors.

As well, to really test the adage, I would like to have seen the life spans of chiropractic patients who regularly received "maintenance care" over many years compared with the average population. After all, I would think that more than a small minority of chiropractors get care based mainly on symptoms rather than the full prevention model that the adage alludes to.

David Parker DC  
Bonnyville, Alberta

<http://skepdic.com/deaddocs.html>

### To the Editor in reply:

I thank Dr. Parker for his response to the recent study published in JCCA reviewing the basic lifespans of white, male chiropractors vs. the same groups in the general population and in the medical profession.<sup>1</sup> In that study it was found that chiropractors had an average lifespan of approximately 74 years, vs. 76.9 years for the general population, and 81.5 years for medical doctors.

Dr. Parker referred to a website debunking the Joel Wallach "Dead Doctors Don't Lie" audio tapes wherein it was also asserted that "... the average life-span of a physician is 70.8 years."<sup>2</sup> Unfortunately, the website provided does not itself provide a reference supporting the claim that physicians have only a 70.8 year lifespan, asserting only that the information came from a Kevin Kenward of the AMA. A search of both the JAMA and AMA websites, however, found no instance of a Kevin Kenward ever having made such an assertion. A medline search revealed a single instance wherein Kenward co-authored a study examining physician characteristics and Medicare claims data but no evidence of Kenward having made a claim of a 70.8 year physician lifespan.<sup>3</sup> In the absence of further supporting evidence this assertion must be viewed with suspicion.

Dr. Parker's suggestion for following a large chiropractic patients for a lifetime is worthy of consideration even though such a study would be difficult to implement.

Since the "Does chiropractic 'Add Years to Life'?" study was published additional data on physician lifespan has become available. One study found an average age at death of U.S. white male physicians to be 73.0 years.<sup>4</sup> This figure, however, included deaths from accidents and suicides. It has been found elsewhere that accidents account for nearly 10 percent of physician deaths, with a high percentage of those coming from private airplanes.<sup>5</sup> If suicide and accident deaths, which generally occur at younger ages, are excluded the average age at death of medical physicians then rises substantially higher than 73.0 years.

The bigger question, however, is not how long do MDs live, but rather **'Why don't chiropractors live longer'?**

The study on chiropractic longevity included many prominent names in chiropractic: educators, association leaders, etc. These doctors represent the 'cream of the crop' in chiropractic circles. Yet these individuals, whom we might expect to best exemplify the benefits of the 'chiropractic lifestyle', to 'walk the talk', to 'set the example', as it were, had lifespans below the national average.

How might we explain this? Several hypothetical factors might contribute, including:

- 1 Chiropractors may have an over-reliance on treating 'subluxations' for all health problems and at the same time viewing MDs as the enemy. Thus they may avoid receiving appropriate medical treatment for cancer, heart disease, diabetes, etc., thus shortening their lives.
- 2 Stress is already known have a deleterious effect upon human health. Chiropractors not only have the stress of education, running a practice, etc., but also the additional stress of intense infighting within the profession, and the stress of constantly being shunned by much of the health care community.
- 3 It is well known that influenza is deadly amongst the elderly.<sup>6</sup> If older chiropractors insist on following the misguided tradition of avoiding all immunizations they may increase their risks and shorten their lifespans.

If the above hypotheses are correct then it appears chiropractors are their own worst enemy when it comes to

longevity. All of the above risks are correctable by chiropractors accepting and incorporating correct scientific information – even when it collides with long-standing traditions.

Lon Morgan DC, DABCO

### References

- 1 Morgan L. Does Chiropractic ‘Add Years to Life’? JCCA 2004; 48:217–224.
- 2 <http://skeptdic.com/deaddocs.html>.
- 3 Baldwin L, et al. Linking physician characteristics and medicare claims data: issues in data availability, quality, and measurement. Med Care 2002; 40:IV-82–95.
- 4 Frank E, Biola H, and Burnett C Mortality Rates and Causes Among U. S. Physicians. Am J Prev Med 2000; 19:155–159.
- 5 Ullmann U. Cause-Specific Mortality Among Physicians With Differing Life-Styles. JAMA 1991; 265:2352–2359.
- 6 Thompson W. Influenza-associated hospitalizations in the United States. JAMA 2004; 292:1333–1340.

### To the Editor:

This letter concerns the article that was written by Lon Morgan, *Does chiropractic “add Years to life”?* (JCCA 2004; 48(3):217–224)

In the conclusion of his paper Dr Morgan states “Further study is recommended to discover what factors might contribute to lowered chiropractic longevity.” This conclusion implies that the longevity of chiropractors is indeed lower. By his own admission “the data is limited in not including all chiropractic deaths” and Morgan also states “Even still, it is uncertain whether the deaths appearing in these publications represent a valid sample of all chiropractic practitioners in general”. What the article does at best is show a possible small reduction of chiropractic longevity. Further study should be aimed first of all at finding out if there is indeed a reduction in chiropractic longevity and then, if there is, looking for the factors that could play a role.

The article also talks about “chiropractic lifestyle”. I guess that would comprise healthy habits and regular chiropractic care. First, we don’t know if the chiropractors that passed away were getting adjusted somewhat regu-

larly. I’m always amazed to talk to chiropractors and find out that they haven’t been adjusted for a year or more. If they got adjusted regularly, we don’t know if the care was precise and scientifically sound or some kind of “pop and pray” technique. Also some chiropractors get adjusted regularly but eat the worst food and smoke because they think that as long as “innate is flowing” they are going to be just fine.

I would like to add that even if it is not possible, now or in the future, to measure if “chiropractic adds years to life” for a certain population, it does without a doubt add years to life for specific patients. I’ve been in practice for 6 years and two patients, so far, have flat out told me that they would have committed suicide had it not been for the chiropractic care that they received. And I’m inclined to believe them. I’m sure that any chiropractor that has been in practice for a while has either experienced those things in his office or heard of such things happening in another practice. I’ve also heard of and seen numerous animals that were scheduled for euthanasia that got adjusted and went on to live for a few more years. For those people and animals chiropractic sure made their life longer. Unfortunately, most of these events never get published making it difficult to measure them.

In conclusion I do wish to congratulate Dr Morgan for taking on a tough question and probably an unpopular one too.

Paul Labelle DC  
Private Practice, Montreal

### To the Editor in reply:

I thank Dr. Labelle for his thoughtful commentary. There is much to agree with in his views. Dr. Labelle asks whether “... the chiropractors that passed away were getting adjusted somewhat regularly.” We don’t know and can only, at best, assume that they were. These were, after all, some of the most noted teachers and leaders in the profession, but ultimately we don’t know if they were practicing what they preached. To answer the question definitely would entail following a large number of DCs over many decades ensuring they did receive regular spinal adjustments and also controlling for any number of other variables. A daunting task indeed.

As Dr. Labelle alluded chiropractors have conflicting views on topics like nutrition. Some have asserted to the effect that “... you can dine at the Ritz, or eat out of a dumpster. If your spine is inline, you’ll feel fine.” Others promote a dizzying array of vitamins and supplements out of their offices. Anyone who visits a chiropractic convention will also notice the relatively large number of DCs who continue to smoke in spite of massive evidence regarding the detrimental health effects of smoking. This combined with the maze of various chiropractic assessment and adjusting approaches and it’s difficult to say what the true “*chiropractic lifestyle*” is.

If we can’t determine what “*typical*” chiropractic care is, and if chiropractors themselves do not demonstrate any longevity advantage, then how can we determine whether any real-world health benefit accrues to the average chiropractic patient?

A disciplined, evidence-based re-assessment of chiropractic’s appropriate place in health care is called for.

Lon Morgan DC, DABCO

**Chiropractic Dinosaur.**  
**JCCA 2004; 48(3):198–200 (commentary).**

**To the Editor:**

First, I must commend Dr. Halowski for his extensive efforts over his years of practice. Clearly he has made every effort to promote and support chiropractic through his distinguished career.

But, alas, I am unable to agree with the intent of his commentary. While the student who called Dr. Halowski a “Chiropractic Dinosaur” may have been rude, I hope he was correct. I hope that this profession is advancing, for us to survive another century we need to evolve; we cannot simply follow the words of DD and BJ as gospel while ignoring the advances around us.

I won’t bother debating the details of Dr. Halowski’s comments – such as the statement “... subluxations do exist, that they are real and have been scientifically validated ...” – the effort would be pointless, I’d rather focus on the overall message of resistance to progression.

When I started at CMCC some 14 years ago the profession was split along “straight” and “mixer” philoso-

phies – I don’t believe those are valid descriptors anymore. Our profession is now split more along Empiricist vs. Rationalist attitudes (Measuring philosophy: a philosophy index – JCCA 2002; 46(3)). Empiricists primarily validate chiropractic from their own experience and accept traditional chiropractic philosophy, whereas Rationalists look for scientific validation and focus more on the NMS conditions.

This dichotomy continues to dog the profession. We cannot be both. While many argue we can each choose our own path and work together, it’s not functional. We cannot claim in our favour the weight of evidence supporting SMT for NMS conditions, but at the same time ignore the studies denying organic effects.

If we choose the traditional route then I don’t see our profession maintaining a significant role in an increasingly evidence-based health care field. We’d be relegated to the alternative medicine category, which will progressively shrink as “medicine” co-opts individual effective treatment techniques (specifically manipulation) and applies them in an evidence-based fashion.

There is no question that chiropractic survived and blossomed due to the passion and drive of individuals who, like Dr. Halowski, put their heart and soul behind “Chiropractic”. But, to say chiropractic is “... the detection and the correction of the vertebral subluxation complex and nothing more” minimizes our value. Rather than restricting ourselves, thanks to the efforts of previous generations, we are in a position to take chiropractic the next step forward. To become neuromusculoskeletal specialists.

In over 10 years of practice (which by the way I enjoy, and my patients seem to appreciate) I have NEVER detected or corrected a “Subluxation” – apparently I’m “not a real Chiropractor”. Instead, I view chiropractic as a manual branch of medicine – focused on the relief of NMS disorders.

The public already views chiropractors as specialists for back pain. The niche NMS market exists, we have a huge head start, but physiotherapists are angling to fill the gap with more courses on manipulation and advancement towards DPT designation. We need to, as a group, step forward to fill the roll as NMS specialists. Even the CCA’s marketing program is aiming for that same market.

The question that Dr. Halowski asks “Would I have the power and passion to move this profession forward?” – To which I answer, yes – I have every hope of moving

this profession forward towards NMS specialists. Building on our current diagnostic skills and effective treatment by adopting additional efficacious treatment approaches that can help our patients. Techniques with proven effectiveness in musculoskeletal complaints – rehabilitation, soft tissue therapies (myofascial release, stretching, massage, etc.), maybe acupuncture, even medications if appropriate.

Or, would I rather be a “Chiropractic Dinosaur” – focused on keeping the Chiropractic “... principle and practice unadulterated and unmixed” from its inception over 100 years ago. That is not moving us forward – that is resistance to progression.

Times change – It’s important to understand the battles that were fought to build this profession – but we can’t let century old ideas restrict us from evolving into something better. If we are to move forwards some of the original ideas need to retire to the history books rather than continue as the forefront of our profession.

Mark Bodnar, DC, FCCRS(C)  
www.bedfordchiro.ca

### To the Editor in reply:

I rest my case, just like this student you may be practicing in the future, it just won’t be chiropractic. You need to embrace the past to enhance the future. You can’t have a foreground without a background. I never, never want to be part of medicine and refer to myself as a NMS specialist. I will always want to be referred to as a chiropractor.

Allan Halowski DC  
Calgary, Alberta

### The effect of low force chiropractic adjustments on body surface electromagnetic field. JCCA 2004; 48(1):29–35.

### To the Editor:

In consideration of the authors’ response,<sup>1</sup> it appears that I may not have clearly stated my question. My question is *Why did the authors not statistically analyze the difference between the control group and the intervention*

*group?* The authors reported that there was no statistically significant change in the control group over time and two statistically significant changes in the intervention group over time. These analyses are *within group* comparisons (comparing *before* to *after* within each group: Tables 1–2, Figures 2–5).<sup>2</sup> However, a more clinically relevant comparison would have been to analyze the outcomes of the intervention group directly to that of the control group (a *between group* comparison). This is a more common analysis when a control group is used and is really the only way to determine if there is a difference between a control group and an intervention group.

My second question had to do with the use of multiple t tests. Because t tests are designed for one comparison of two means, comparing a number of variables (e.g. cervical EMF, thoracic EMF, lumbar EMF, and sacral EMF) using four t-tests is inappropriate. The more comparisons you make, the more likely it is that you’ll see a statistically significant difference in one of the comparisons, simply due to chance. In this article,<sup>2</sup> what’s called the *familywise* or *experimentwise* error rate (the cumulative error due to the use of four comparisons) is 0.19 or 19%. This means there is a 19% chance that the differences appear as a statistically significant different but aren’t (a Type 1 error). You can make a correction for this (i.e., using a Bonferonni correction) or use statistics designed for multiple comparisons.

Because of the lack of a *between group* comparison, I am not convinced that the decrease in EMF reported was the result of low force chiropractic adjustment. I’m also not convinced that the differences found were statistically significant. As such, I feel it’s premature to use of EMF in a larger trial. Using a *between group* comparison and appropriate statistics would certainly help convince me that EMF is a potentially useful outcome measure worthy of future study.

Cam McDermaid DC, FCCS(C)  
CMCC

### References

- 1 Zhang J, Snyder BJ. Letters to the Editor. J Can Chiropr Assoc 2004; 48(3):235.
- 2 Zhang J, Snyder BJ, Vernor L. The effect of low force chiropractic adjustments on body surface electromagnetic field. JCCA 2004; 48(1):29–35.

**To the Editor in reply:**

Why did the authors not statistically analyze the difference between the control group and the intervention group? To answer this question, we need to understand the purpose of the study. In our EMF study, we tried to determine very subtle changes in the body surface EMF. These subtle changes are easily disappeared or covered by the between group variations. Using t-test for within group comparisons allowed us to see if there are any differences before and after chiropractic adjustment. If there is a difference, we will move on to larger scale studies or using more vigorous statistical analysis. If there is no dif-

ference even within a group, we will not bother to do more testing at the same level.

The second question is about the use of multiple t tests. I don't know if I can analysis the before and after adjustment changes of cervical EMF, thoracic EMF, lumbar EMF, and sacral EMF using any other test, such as ANOVA, simply because these are different areas of body sharing no similarities in EMF readings. ANOVA test on these four regions provides no meaningful analysis.

John Zhang MD, PhD  
Brian J. Snyder DC

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