

# Dr. Chestnut's Research Review

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© Dr. James L. Chestnut M.Sc., D.C., C.C.W.P.

## **Evidence-Based Protocols: Putting the Body of Evidence into Practice**

I thought I would start the year by breaking the regular format of reviewing a single article and instead point out the body of evidence in support of chiropractic with the intent of helping bridge the gap between research and evidence-based practice. Evidence-based practice means practicing according to the evidence, not simply using the evidence to justify whatever interventions you choose to sell to patients. If the evidence is valid, then evidence-based care should result in superior health outcomes. The good news is - it does! The bad news is that few practitioners, in any healthcare field, are adequately aware of the evidence regarding spinal healthcare, or practicing according to it.

From the Bishop study which I reviewed in March 2017, "The knowledge translation [of the evidence] to primary health-care providers has, to date, been unimpressive. Multiple studies have demonstrated a poor correlation between what primary health-care providers think is an effective treatment and what has actually been shown to be an effective treatment." (*Bishop et al. (2010) The Chiropractic Hospital-based Interventions Research Outcomes Study: A randomized controlled trial on the effectiveness of clinical practice guidelines in the medical and chiropractic management of patients with acute mechanical low back pain. The Spine Journal 10(12): 1055-1064.*) Worse, there is a poor correlation between what chiropractic, medical, and physiotherapy schools teach, and what has actually been shown to be an effective treatment.

When the evidence with respect to patient outcomes from a reasonable course of chiropractic care with reasonable frequency and duration is compared to evidence with respect to patient outcomes from the use of drugs, surgery, physiotherapy, massage, acupuncture, or any other available spinal health care intervention, a fair interpretation is that chiropractic emerges as the most effective intervention available.

One might wonder then why systematic reviews don't always reflect this. The answer, as I will show you over the course of this year by reviewing the evidence, is that there is a documentable bias against chiropractic. Many studies that get included in these systematic reviews are studies that only include 2-3 adjustments or manipulations, often in comparison to much higher frequency and duration of other interventions. The literature, including many systematic reviews, is full of studies that provide courses of adjustments or manipulations that are clearly not representative of usual chiropractic care and that compare the effects of such invalid courses of chiropractic care to usual medical or physiotherapy care.

The one glaring exception to this is the study by Bishop et al. which compared a usual course of 4 weeks of chiropractic care to a usual course of 12 weeks of medical care that included unlimited drugs, referral for physiotherapy, kinesiology, or massage at the discretion of the medical doctor. From the Bishop study, "This is the first reported randomized controlled trial comparing full clinical practice guideline-based treatment, including spinal manipulative therapy administered by chiropractors, to family physician-directed usual care in the treatment of patients with acute mechanical low back pain." The results? "Compared to family physician-directed usual care [prescription drugs from physicians, referral to physiotherapist and/or kinesiologist and/or massage therapist], full clinical practice guideline-based treatment including chiropractic spinal manipulative therapy is associated with significantly greater improvement in condition-specific functioning." (*Bishop et al. (2010) The Chiropractic Hospital-based Interventions Research Outcomes Study: A randomized controlled trial on the effectiveness of clinical practice guidelines in the medical and chiropractic management of patients with acute mechanical low back pain. The Spine Journal 10(12): 1055-1064.*)

How much better was 4 weeks of 2-3 adjustments/week of chiropractic compared to 12 weeks of usual medical care which included drugs, physiotherapy, kinesiology, or massage and in which 78% of the usual medical group patients were still taking opioids after 12 weeks? After 12 weeks, and after a full 8 week gap with no chiropractic care because all the chiropractic care was provided in the first 4 weeks, compared to a full continuous 12 weeks of usual medical care, the chiropractic group still showed a 2700% greater improvement!

The frequency and duration of care is not a major factor when rating the quality of a study using the Jadad or other research study quality rating scales so studies that include only 2-3 adjustments or manipulations can be rated very highly in terms of methodological quality. Further, valid studies documenting excellent results from chiropractic and/or manipulation (like the Bishop and Senna studies previously reviewed) are often not included in systematic reviews. The studies that get included or excluded in systematic reviews are determined by the reviewers. Systematic reviews themselves are inconsistent with respect to which studies they include or exclude! How does one rate the quality of a systematic review?! The answer is one must go through each of the studies included, be aware of the studies excluded, be aware of the methodology of each study and how to assess it for validity not just in terms of subject inclusion, randomization, outcome measures, blinding, and inclusion of placebo, but in terms of whether or not the frequency and duration of the interventions are balanced among subject groups and representative of usual, evidence-based care. You can see why so few are able or willing to critically review systematic reviews!

Even worse, the lack of evidence for usual medical care, surgery, and physiotherapy are rarely pointed out and rarely is there a willingness to apply the same burden of proof to these interventions as there is to chiropractic. Often the excuse that the research regarding chiropractic is inconsistent or confusing is put forward as a justification to withhold recommendation of chiropractic care yet the far more inconsistent and confusing, and often plainly negative research results for drugs, surgery, and physiotherapy are completely ignored. There is simply no valid scientific or ethical way to justify the current lack of usage of, referral for, or insurance coverage for chiropractic interventions, or to justify the current virtual monopoly of usage of, referral for, and coverage for, usual medical care, surgery, and physiotherapy. The claim that more evidence is required for chiropractic as more expensive, less effective, and often more harmful interventions continue to be fully accepted and covered is, in itself, strong evidence of either ignorance, bias, or both.

I have never said that there is unequivocal evidence that chiropractic works every time for every patient or that more research is not warranted. What I have always said is that there has been an enormous amount of research on manipulation or adjustment and that a fair reading of the literature, when one holds every possible spinal healthcare intervention to the same burden of evidence, and one directly compares a fair course of usual chiropractic care to usual medical care, surgery, physiotherapy, acupuncture, or massage, that the evidence regarding effectiveness and cost-effectiveness is clearly stronger for chiropractic than any other available intervention. Thus, based on the available evidence, chiropractic should not simply be labeled one of many possible equal alternatives to usual medical care but should be, based on the evidence, the most highly recommended primary care intervention for non-traumatic, non-infectious, non-cancerous spinal health problems.

I have always believed that the best thing that ever happened to chiropractic is the movement toward evidence-based care. The truth is that the current available body of evidence, when read and interpreted without bias, strongly supports chiropractic and/or manipulation as the best available intervention choice - IF chiropractors practice according to this body of evidence. I am not blindly biased in favor of chiropractic and you shouldn't be either. I am biased in favor of the available body of evidence and you should be too. I am equally critical of the lack of implementation of evidence into chiropractic education and practice as I am of the lack of implementation of evidence into other healthcare education and practice. However, being evidence-based requires an honest and open discussion of the evidence for, or the lack of evidence for, all available interventions. The fact that all available interventions require further study should never be used to hide the fact that not all available interventions have the same current level of evidence - they don't!

The tactic of demanding more and more evidence for chiropractic while continuing to advocate and pay for less evidence-based, less effective, more expensive, and often more harmful alternatives has been used for decades and it has conservatively cost trillions of dollars, hundreds of thousands of lives, millions of life years, and tens of millions of quality life years. Enough!

The only way to end this is to create an evidence-based culture within chiropractic education and practice. The only way to do this is to make chiropractors and other healthcare providers aware of the evidence and to create evidence-based practice protocols based on this evidence. I have spent my professional life in this pursuit. I did not create intervention protocols and then go out and find ways to justify them or market them. I spent years reading the peer-reviewed literature and then, based on this literature, created and taught Evidence-Based Chiropractic Protocols (and Evidence-Based Lifestyle Protocols).

The most evidence-based interventions available for patients with non-traumatic, non-infectious, non-cancerous spinal health problems are, without doubt, chiropractic, omega-3, vitamin D (and Vit A), daily spinal hygiene exercises, regular aerobic and strength exercise, and regular psychological fitness exercise. There is simply no more evidence-based or effective way to restore and/or maintain spinal health and function and spine-related overall health and quality of life. I will focus on physical and psychological exercises in future reviews, for this review I will quickly summarize the evidence for chiropractic, omega-3, and vitamin D (and vit A).

### **Chiropractic, Omega-3, and Vitamins A and D: The Most Evidence-Based Spinal Health Protocol**

Let's start with a review (by no means comprehensive) of some of the body of clinical evidence for chiropractic. I will then provide a similar review of the body of clinical evidence for supplementation with omega-3 and vitamins A and D.

#### **Chiropractic**

**1979:** "By the end of the Inquiry we found ourselves irresistibly and with complete unanimity, drawn to the conclusion that modern chiropractic is a soundly-based and valuable branch of health care in a specialized area neglected by the medical profession." (*Chiropractic in New Zealand. (1979) Report of New Zealand Government Commission on Chiropractic*).

**1992:** "A fair interpretation of the evidence accumulated to date indicates that the impact of chiropractic mandates comes close to the "best case" scenario of low costs and high benefits." (*Schiffrin, L.G. (1992). Mandated Health Insurance Coverage for Chiropractic Treatment: An Economic Arrangement with Implications for the Commonwealth of Virginia. Richmond, Virginia*).

**1993:** "On the evidence, particularly the most scientifically valid clinical studies, spinal manipulation applied by chiropractors is shown to be more effective than alternative treatments for low back pain." "There is an overwhelming body of evidence indicating that chiropractic management of low-back pain is more cost-effective than medical management." "Many medical therapies are of questionable validity or are clearly inadequate." "Our reading of the literature suggests that chiropractic manipulation is safer than medical management of low back pain." "What the literature revealed to us is the much greater need for clinical evidence of the validity of medical management of low back pain." (*Manga, et al. (1993). The Manga Report: The effectiveness and cost-effectiveness of chiropractic management of low-back pain. Richmond Hill, Ontario, CANADA. Kenilworth Publishing (an Independent Report Commissioned by the Ontario Provincial Government)*).

**1993:** "The subgroup analysis suggests better results of manual therapy [manipulation] compared to physiotherapy in chronic patients (duration of present complaints of 1 yr or longer)." (*Koes, B.W. et al. (1993) A randomized clinical trial of manual therapy and physiotherapy for persistent back and neck complaints: subgroup analysis and relationship between outcome measures. J Manipulative Physiol Ther May; 16(4):211-219*)

**1995:** "At three years the results confirm the findings of an earlier report that when chiropractic or hospital therapists treat patients with low back pain as they would in day to day practice those treated by chiropractic derive more benefit and long-term satisfaction than those treated by hospitals." (*Meade, T.W. et al. (1995) Randomised comparison of chiropractic and hospital outpatient management for low back pain: results from extended follow up. BMJ; 311:349*).

**2004:** "In our study population of 0.7 million members who had chiropractic coverage in the medical plan, we estimated an annual reduction of approximately \$16 million as a result of lower utilization of high-cost items." "This study provides additional information regarding the economic benefits and utilization patterns associated with systematic access to chiropractic care." (*Legorreta et al. (2004) Comparative Analysis of Individuals With and Without Chiropractic Coverage. Arch Int Med 164; 18*).

**2007:** Chiropractors using a nonsurgical/nonpharmaceutical approach demonstrated reductions in both clinical and cost utilization when compared with PCPs using conventional medicine alone. (*Sarnat et al. (2007) Clinical Utilization and Cost Outcomes From an Integrative Medicine Independent Physician Association.: An Additional 3-Year Update JMPT 30 (5) 263-269*).

**2007:** "For patients who do not improve with selfcare options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits-for acute low back pain, spinal manipulation [no other intervention was considered to have proven benefits!]." (Chou, R. et al. (2007) *Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med.*; 147: 478-491).

**2008:** "All formal government enquiries into chiropractic since the 1970s have found contemporary chiropractic health care safe, effective, cost-effective and recommended licensure and government funding." (Chapman-Smith, David LL.B. *The Chiropractic Report. (2008) The Chiropractic Profession: Basic Facts, Independent Evaluations, Common Questions Answered. Vol 22 (5) pp1-8.*

**2010:** "Compared to family physician-led usual care, full clinical guidelines-based treatment including chiropractic spinal manipulative therapy is associated with significantly greater improvement in condition specific functioning." (Bishop et al. (2010) *The Chiropractic Hospital-based Interventions Research Outcomes (CHIRO) Study: a randomized controlled trial on the effectiveness of clinical practice guidelines in the medical and chiropractic management of patients with acute mechanical low back pain. The Spine Journal 10(12): 1055-64* .

**2011:** "Compared to care from medical doctors and physiotherapists, care from chiropractors during the disability episode ( "curative"), during the health maintenance care period (main exposure variable, "preventive"), and the combination of both (curative and preventive) was associated with lower disability recurrence HRs (hazard ratios)." "Those cases treated by chiropractors had less use of opioids and fewer surgeries." (Cifuentes et al. (2011) *Health Maintenance Care in Work-Related Low Back Pain and its Association with Disability Recurrence. Journal of Occupational and Environmental Medicine 53(4): 396-404.*

**2011:** "Sixty patients, with chronic, nonspecific LBP lasting at least 6 months, were randomized to receive either (1) 12 treatments of sham SMT over a 1-month period, (2) 12 treatments, consisting of SMT over a 1-month period, but no treatments for the subsequent 9 months, or (3) 12 treatments over a 1-month period, along with "maintenance spinal manipulation" every 2 weeks for the following 9 months." "Patients in the second and third groups experienced significantly lower pain and disability scores than first group at the end of 1-month period ( $P = 0.0027$  and  $0.0029$ , respectively)." "However, only the third group that was given spinal manipulations (SM) during the follow-up period showed more improvement in pain and disability scores at the 10-month evaluation." "In the non-maintained SMT group, however, the mean pain and disability scores returned back near to their pretreatment level." "SMT is effective for the treatment of chronic nonspecific LBP. To obtain long-term benefit, this study suggests maintenance SM after the initial intensive manipulative therapy." (Senna & Machaly (2011) *Does Maintained Spinal Manipulation Therapy for Chronic Nonspecific Low Back Pain Result in Better Long-Term Outcome? SPINE 36 (18) 1427-37.*

**2013:** "In a subgroup of patients with nonspecific LBP, spinal manipulation was significantly better than nonsteroidal anti-inflammatory drug diclofenac (Voltaren) and clinically superior to placebo." (Von Heymann, W. et al. (2013) *Spinal High-Velocity Low Amplitude Manipulation in Acute Nonspecific Low Back Pain: A Double-Blinded Randomized Controlled Trial in Comparison with Diclofenac [Voltaren] and Placebo. Spine 38 (7): 540-548.*

**2014:** "Firstly, in comparison to previous reports of limited evidence showing no difference between true and sham manipulation, the results of this systematic review show moderate to strong evidence for the beneficial effects of manipulation in comparison to sham manipulation." "These differences are demonstrated in terms of pain relief, functional improvement, and overall-health and quality of life improvements in the short-term for all stages of LBP." (Hidalgo, et al. (2014). *The efficacy of manual therapy and exercise for different stages of non-specific low back pain: an update of systematic reviews. Journal of Manual and Manipulative Therapy 22(2): 59-74.*

**Omega-3 Fatty Acids:**

"The agent best documented by hundreds of references in the literature for its anti-inflammatory effects is omega-3 essential fatty acids (EFAs) found in fish and in pharmaceutical-grade fish oil supplements." (Maroon JC, Bost JW. *Omega-3 fatty acids (fish oil) as an anti-inflammatory: an alternative to nonsteroidal anti-inflammatory drugs for discogenic pain. Surgical Neurology. 2006;65(3):326-331*).

"There is extensive documentation in the rheumatology, ophthalmology, and cardiovascular literature on the beneficial anti-inflammatory effects of high-dose fish oil in the reduction of joint pain from rheumatoid and osteoarthritis, and also major positive effects on ... coronary atherosclerosis, which is now considered an inflammatory disease." "In an editorial published in the same issue of *Surgical Neurology*, J.I. Ausman, MD, PhD, states "the importance of this work to neurosurgeons is that now there is an analgesic agent that can take the place of the COX-2 inhibitors and be used with no side effects." (Maroon JC, Bost JW. *Omega-3 fatty acids (fish oil) as an anti-inflammatory: an alternative to nonsteroidal anti-inflammatory drugs for discogenic pain. Surgical Neurology. 2006;65(3):326-331*).

"Omega-3 fatty polyunsaturated fatty acids (PUFAs) have been shown to decrease the production of inflammatory eicosanoids, cytokines, and reactive oxygen species; have immunomodulatory effects; and attenuate inflammatory diseases." (Mickleborough, T.D. *Omega-3 polyunsaturated fatty acids in physical performance optimization. Int J Sport Nutr. Exerc. Metab. 2013; 23: 83-96*).

"A meta-analysis of 16 studies at 3-4 months showed significant effects for four of six pain outcomes: patient assessed pain, morning stiffness, number of painful and/or tender joints, and NSAID consumption [significantly reduced NSAID consumption]." (Goldberg RJ, Katz J. *A meta-analysis of the analgesic effects of omega-3 polyunsaturated fatty acid supplementation for inflammatory joint pain. Pain 129 (2007) 210-233*).

By affecting cell membrane composition, metabolism, signal pathways, and by direct control of gene expression, sufficient omega 3 essential fatty acid levels play a key role in the prevention of human diseases such as obesity, diabetes, cancer, neurological and brain disorders, and heart disease. (Ntambi, J.M. & Bene, H. *Polyunsaturated fatty acid regulation of gene expression. J Mol Neuroscience 2001 Apr-Jun; 16 (2-3): 273-8*).

Fish oil supplementation reduces exercise-induced inflammation, decreases delayed onset muscle soreness, increases the rate of recovery, and reduces the risk for infection due to immunodeficiency. Fish oil supplementation is associated with improved cognitive abilities including reaction time, decision making, and stabilizing mood. (Mickleborough, T.D. *Omega-3 polyunsaturated fatty acids in physical performance optimization. Int J Sport Nutr. Exerc. Metab. 2013; 23: 83-96*).

"A Purdue University study showed that kids low in Omega-3 essential fatty acids are significantly more likely to be hyperactive, have learning disorders, and to display behavioural problems." (Stevens, LJ et. al. *Omega-3 fatty acids in boys with behavior, learning, and health problems. Physiol Behav. 1996 59(4/5) 915-920*).

"Omega-3 fatty acids lower the risk of cancer through their suppressing effect on the biosynthesis of eicosanoids [molecules from omega-6 fatty acids that promote inflammation, suppress the immune cells that eliminate cancer cells, and stimulate cancer cell growth]." (Larsson, SC, et.al. *Dietary long-chain n-3 fatty acids for the prevention of cancer: a review of potential mechanisms. Am J Clin Nutr 2004;79:935-45*).

Due to the overwhelming evidence of benefit, the American Heart Association now recommends the use of omega-3 fatty acid supplements for the primary and secondary prevention of coronary heart disease. (Bronson, U. & Dengel, D. *Influence of vascular oxidative stress and inflammation on the development and progression of atherosclerosis. Am J Lifestyle Med. 4 (6) 521-34*).

### Vitamin D:

"Some researchers have found this (vitamin D deficiency) to occur in up to 85% of chronic musculoskeletal pain cases, especially those involving the lower back." (*Stewart Leavitt, Ph.D. Vitamin D - A Neglected 'Analgesic' for Chronic Musculoskeletal Pain. Pain Treatment Topics June 2008*).

"In the research investigations to date, patients found to have deficient 25(OH)D (Vitamin D) concentrations had been variously diagnosed with fibromyalgia syndrome, hyperesthesia, rheumatic disorders, osteoarthritis, back pain, bone and joint pain, muscle weakness, and other chronic somatic complaints." (*Stewart Leavitt, Ph.D. Vitamin D - A Neglected 'Analgesic' for Chronic Musculoskeletal Pain. Pain Treatment Topics June 2008*).

"The active 1,25(OH)<sub>2</sub>D form of vitamin D is a potent modulator of inflammation, and may play a role in shutting off chronic inflammatory responses." (*Pedersen LB, et al. 1,25-dihydroxyvitamin D3 reverses experimental autoimmune encephalomyelitis by inhibiting chemokine synthesis and monocyte trafficking. J Neurosci Res 2007;85:2480-2490*).

Research indicates that vitamin D supplementation modulates or decreases pro-inflammatory cytokines (e.g. C-reactive protein, interleukin 6 and 12, and tumor necrosis factor-alpha) while increasing anti-inflammatory cytokines (e.g. interleukin-10). Clinical investigators have further suggested that vitamin D may help to moderate painful chronic inflammatory autoimmune conditions that are influenced by excessive cytokine activity, such as inflammatory bowel disease and Crohn's disease. (*Boxer RS, Dauser RA, Walsh SJ, et al. The association between vitamin D and inflammation with the 6-minute walk and frailty in patients with heart failure. J Am Geriatr Soc. 2008;56:454-461*).

Subjects were treated for 3 months with 5000 IU/day to 10,000 IU/day of vitamin D3 (patients >50 kg received the larger dose). There were no episodes of hypercalcemia reported, and pain symptoms were relieved in 95% of the patients. (*Al Faraj S, Al Mutairi K. Vitamin D deficiency and chronic low back pain in Saudi Arabia. Spine 2003;28:177-179*).

Supplementation of Vit D in subjects with deficient Vit D levels resulted in a 50% increase in muscle force and reaction time. A similar change was seen in the ability to relax the muscle - in other words the muscle responds quicker to the brain signal both to contract and relax. Vit D regulates calcium metabolism and calcium is responsible for muscle contraction. (*Glerup H., Mikkelsen K, Poulsen L, et al. Hypovitaminosis D myopathy without biochemical signs of osteomalacic bone involvement. Calcif Tissue Int. 2000; 66:419-424*).

Vitamin D levels are correlated with muscle efficiency and muscle mitochondrial activity and phosphocreatine recovery significantly improved with vitamin D supplementation. In a parallel study the researchers showed that low vitamin D levels were associated with reduced muscle function and recovery. (*Akash Sinha, et al. Improving the vitamin D status of vitamin D deficient adults is associated with improved mitochondrial oxidative function in skeletal muscle. Endocrine Abstracts, 2013; DOI: [10.1530/endoabs.31.OC1.6](https://doi.org/10.1530/endoabs.31.OC1.6)*).

"Birge and Haddad found that supplementation with vit D acts directly on muscle to increase protein synthesis." "Several cross-sectional studies have assessed associations between Vit D levels and various parameters of neuromuscular performance, finding direct associations between Vit D levels and physical performance. Correlations were more frequent and strongest for reaction time, balance, and timed tests of physical performance." (*Cannell et al. (2009) Athletic Performance and Vitamin D. Medicine and Science in Sports and Exercise. 41 (5) 1102-1110*).

"Several randomized controlled trials in older adults found that vitamin D improves various parameters of neuromuscular functioning, including balance, muscle strength, and reaction time... ." "Another test of the theory are interventional studies in reducing falls, assuming falls are failures of athletic performance. Bischoff-Ferrari et al. recently reviewed that literature and concluded that vitamin D, even in relatively low doses (800 IU/day), reduces falls in the elderly." (*Cannell et al. (2009) Athletic Performance and Vitamin D. Medicine and Science in Sports and Exercise. 41 (5) 1102-1110*).

"Vitamin D dramatically up-regulates the genetic expression of antimicrobial proteins (AMPs) in immune cells of the innate immune system [the part of the immune system that immediately attacks and kills viruses, bacteria, and fungi - the branch of the immune system responsible for fighting colds and flu]." "Also, macrophages use vitamin D to enable the synthesis of the bactericidal peptides needed to deal with bacterial invaders." (*Nature Immunology, (Vitamin D controls T cell antigen receptor signaling and activation of human T cells ) 10.1038/ni.1851*).

In a 3 year trial taking 800 IU/day of Vitamin D reduced the incidence of colds and flu by 70%. In the group taking 2000 IU/day the incidence of colds and flu was reduced by almost 100% (only 1 of 104 subjects developed cold or flu). (*Alogia, J. et al. Epidemic Influenza and Vitamin D. Epidemiology and Infection 2007, Vol 135 (7) pp. 1095-1098*).

A group of Type 2 diabetic subjects with chronic, painful neuropathy were supplemented with 2000 IU/day of Vitamin D for 3 months. Symptoms improved from an average of "distressing" to an average of "mild". Overall results were a nearly 50% reduction in pain scores. (*Lee P, Chen R. Vitamin D as an analgesic for patients with type 2 diabetes and neuropathic pain. Arch Intern Med. 2008;168(7):771-772*).

Vitamin D-sensitive cancers are responsible for 257,000 deaths (46% of all cancer deaths in U.S. in 2007). (*Jemal A, et al. Cancer statistics, 2007. CA Cancer J Clin. 2007 Jan-Feb;57(1):43-66*).

A four-year study on vitamin D supplementation showed a 77% reduction in all invasive breast cancers in women who received vitamin D supplementation versus those who did not supplement. (*Lappe, J.M. et al. Vitamin D and calcium supplementation reduces cancer risk: results of a randomized trial. Am J of Clin Nutr 2007;85:1586-1591*).

Women who maintained sufficient vitamin D levels had an 80% reduction in breast cancer incidence compared to those who had deficient vitamin D levels. (*Lowe, LC et al. Plasma 25-hydroxy vitamin D concentrations, vitamin D receptor genotype and breast cancer risk in a UK Caucasian population. Eur J Cancer. 2005;41:1164-9*) ..

"High serum vitamin D was associated with lower mortality from breast cancer." "Patients with the highest concentration of Vitamin D had approximately half the fatality rate compared to those with the lowest concentration." (*Mohr SB et al. Meta-analysis of Vitamin D sufficiency for improving survival of patients with breast cancer. Anticancer Research. 2014;34:1163-1166*).

"In an earlier study, patients with clinical depression were randomized to receive vitamin D3 supplementation or placebo. Those patients administered vitamin D had significantly enhanced mood and a reduction in negative-affect symptoms." (*Stewart Leavitt, Ph.D. Vitamin D - A Neglected 'Analgesic' for Chronic Musculoskeletal Pain. Pain Treatment Topics June 2008*).

### **Importance of Supplementing Vitamins A and D Together Using Cod Liver Oil - why I created Innate Choice® OmegaA+D Sufficiency™ composed of half fish oil and half cod liver oil:**

The reason I include vitamin A is because vitamins A and D act synergistically and physiologically modulate each other's absorption and utilization via epigenetic changes to each other's receptors on cell membranes.

It is imperative that the source of vitamin A is from traditional Norwegian-Processed cod liver oil because this type of cod liver oil contains naturally occurring vitamin A. Most methods of deodorization of cod liver oil remove the vitamin A and then replace it with synthetic vitamin A.

Synthetic vitamins, including synthetic vitamin A, have been shown in multiple studies to increase cancer rates. In a study of 22,000 pregnant women who were given synthetic Vitamin A the study was halted because birth defects increased 400% (*Rothman, K. Teratogenicity of High Vitamin A Intake. N Eng J Med. 1995: 333;1369-1373*). In a study of 29,000 male smokers who were given synthetic beta carotene and synthetic Vitamin E the study was stopped when rates of lung cancer, heart attacks, and death increased (*Beta Carotene Cancer Prevention Study Group. The effect of vitamin E and beta carotene on the incidence of lung cancer and other cancers in male smokers. N Eng J Med. 1994: 330;1029-1035*).

"Vitamin A, provitamin A, and carotenoids are well-known antioxidants. However, humans cannot synthesize vitamin A and must obtain it from their diets." "Cod liver oil is a good source of vitamin A supplementation, as the dose of vitamin A is moderate and the quality of vitamin A is excellent." (*Huang, WB et al. Cod liver oil: a potential protective supplement for human glaucoma. Int J Ophthalmol 2011;4(6):648-651*).

"Cod liver oil is used widely as a dietary supplement. It is a rich source of vitamin A, vitamin D, and essential omega-3 fatty acids, especially eicosapentaenoic acid (EPA) and docosahexanoic acid (DHA)." "In previous studies, cod liver oil supplementation has been suggested to reduce cardiometabolic risk factors, have anticancer effects, and ameliorate cognitive impairment induced by chronic stress." (*Huang, WB et al. Cod liver oil: a potential protective supplement for human glaucoma. Int J Ophthalmol 2011;4(6):648-651*).

"The active form of vitamin D3 is an immunoregulatory hormone with beneficial effects on Th1 cell-mediated inflammatory diseases." "Thus, we initially reveal that Vit D and Vit A have synergistic effects on the generation of Th17 cells, suggesting that the combination would provide a promising novel therapy for Th17 cell-related immune diseases including skin inflammation." (*Ikedo, U et al. 1,25 dihydroxyvitamin D3 and all-trans retinoic acid synergistically inhibit the differentiation and expansion of Th17 cells. Immunology Letters 2010. 134(1):7-16*).

"Vitamin A and vitamin D balance, enhance, and contain each other through the retinoid X receptor (RXR)." "Because they share a receptor, if we supplement either vitamin D or vitamin A in an unbalanced fashion, we create a functional deficiency of the one not supplemented." "Low blood levels of vitamin D, vitamin A, and carotenoids are all correlated with greater risk of heart disease." "Both vitamin A and vitamin D are far more than vitamins, with profound effects on every tissue of the body...they are involved in regulation of everything from bone to the brain, the kidney to the immune system, the heart to the pancreas." (*Levine, SA. The importance of a balanced approach to vitamin D supplementation. Journal of Orthomolecular Medicine. 2011;26(1):15-20*).

"In summary, we describe a unique and unexpected facet of intermolecular cross-talk between VDR and RXR and demonstrate that RXR actively participates in RXR-VDR-mediated gene transcription by directly recruiting coactivators in response to 1,25-(OH)-2D-3." [In layperson terms vitamin A (retinoid) is required to activate the expression of vitamin D controlled genes. In other words, without sufficient amounts of vitamin A, the actions of vitamin D can be impaired or even blocked. Vitamin A and Vitamin D work synergistically.] (*Bettoun, Burris, et al. Retinoid X Receptor Is a Non-silent Major Contributor to Vitamin D Receptor-Mediated Transcriptional Activation. Molecular Endocrinology 17: 2320-2328, 2003*).

"Vitamins A and D each increase the genetic expression of cell receptors for the other. Together, vitamins A and D cause a three-fold increase in production of receptors compared to either vitamin alone." "This would imply that the policy of giving vitamin D supplement alone in pregnancy instead of cod liver oil would need adjustment. Cod liver oil, as natural supplement of vitamin A and vitamin D, is well known for its beneficial effects on the growth of infants and children." (*Ng et al. Vitamin D and vitamin A receptor expression and the proliferative effects of ligand activation of these receptors on the development of pancreatic progenitor cells derived from human fetal pancreas. 2011 Stem Cell Rev 7 (1): 53-63*).

"TUNEL showed vitamin A and vitamin D induced prostate cancer cells apoptosis [cancer cell death]. The combination of vitamin A and vitamin D markedly enhanced the expression of Bax and reduced the expression of Cyclin D1 by real time-PCR and western blot assay." "In conclusion, vitamin A and vitamin D could synergistically induce apoptosis in prostate cancer cells." (*Sha, J et al. Synergistic effect and mechanism of vitamin A and vitamin D on inducing apoptosis of prostate cancer cells. Mol Biol Rep. 2013;40(4):2763-2768*).



### Dr. Chestnut's Commentary

As I said earlier, I believe the path to success for the chiropractic profession and for individual chiropractors is to create an evidence-based culture within chiropractic education and practice. The only way to do this is to make chiropractors and other healthcare providers aware of the evidence and to create evidence-based practice protocols based on this evidence.

I have spent decades completing a Master's Degree in Science, completing my Doctor of Chiropractic degree, reading and reviewing thousands of peer-reviewed papers, writing books, creating and teaching the material for the International Chiropractors Association Evidence-Based Chiropractic and Wellness Lifestyle Certification program, and doing my best to educate practitioners and the public by providing thousands of lectures around the world and creating my monthly research review and newsletters.

I have used the knowledge, experience, and wisdom I have gathered to create Evidence-Based Chiropractic and Evidence-Based Lifestyle Protocols and implementation systems that include evidence-based patient assessment, reports, education, and intervention. I also created Innate Choice, the world's only supplement company that sells only evidence-based essential nutrient supplements. I continue to do all I can to provide practitioners with what they need to create a highly successful, highly ethical, evidence-based practice and to build a highly successful, highly ethical, evidence-based chiropractic profession.

I hope this month's review helps you to more fully understand and to have easier access to the body of evidence for chiropractic and to feel more confident in the body of evidence supporting chiropractic adjustment as the world's most evidence-based intervention for spinal health. I hope also that you have a better understanding of the importance of supplementation with omega-3 and vitamins A and D, why I created OmegaA+D Sufficiency, and why it is the world's best source of omega-3 and synergistic amounts of vitamins A and D.

Most of all I hope I have successfully encouraged you to implement the available evidence into your practice, to provide the most evidence-based interventions in order to elicit the best possible patient outcomes, and to experience the enormous ethical practice success that every ethical chiropractor deserves.

I hope you will join me in 2018 at either the certification program modules in Dallas or at one of the Evidence-Based Protocols seminars. Go to [www.thewellnesspractice.com](http://www.thewellnesspractice.com) and check out the dates and locations.

My goal for 2018 is to reach and help more chiropractors and to help them learn and implement the evidence in order to achieve practice success. If you feel they could help others, I would appreciate your referrals for the newsletter service, seminars, and other educational materials. Thank you.

Wishing you a very healthy, happy, evidence-based, and prosperous new year!