

Reducing Pain and Inflammation Naturally – Part 3: Improving Overall Health While Safely and Effectively Treating Musculoskeletal Pain

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Abstract: Following the optimization of diet and fatty acid balance, the next therapeutic steps in the treatment of pain and inflammation can include the use of vitamin D, chondroitin sulfate, niacinamide, and botanical medicines such as *Boswellia*. In direct contrast to so-called “anti-inflammatory drugs” which always have significant toxicity, each of these natural treatments has been proven in controlled clinical trials to significantly reduce pain and inflammation without major adverse effects. Chondroitin sulfate has actually been shown to reduce cardiovascular mortality in humans while it safely and effectively ameliorates the pain and inflammation of osteoarthritis. Similarly, vitamin D supplementation has been proven effective in the treatment of hypertension, depression, migraine headaches, polycystic ovary syndrome and in the prevention of type-1 diabetes. By failing to fully cover chiropractic and naturopathic healthcare services, insurance companies which comprise and contribute to the American healthcare system are losing profitability and forcing patients to use drug and surgical treatments that are commonly less effective, more dangerous, and more expensive than the natural treatments described in this paper. Services provided by chiropractic and naturopathic physicians are supported by peer-reviewed research and deserve equitable coverage and status in America’s healthcare system.

INTRODUCTION

As primary care providers with specialized training in musculoskeletal medicine, chiropractic physicians typically play a dual role in clinical practice on a daily basis, generally striving to simultaneously accomplish two related goals in each patient: 1) promoting overall wellness and professionally-supervised patient-implemented preventive healthcare, and 2) alleviating acute and chronic musculoskeletal pain. Both of these goals are important given the tremendous financial and social impact of musculoskeletal pain and the progressive deterioration of Americans’ health. At any given time, nearly thirty percent of the American population suffers from musculoskeletal pain, joint swelling, or limitation of movement, and approximately 1 of every 7 (14% of total) visits to a primary healthcare provider is for the treatment of musculoskeletal pain or dysfunction. Resulting in more than \$100 billion in US healthcare costs each year, back pain is the most prevalent medical problem in the US, is the leading cause of long-term disability, and is the second leading cause of restricted activity and the use of prescription and non-prescription drugs.¹ The preventive healthcare and wellness promotion advocated and implemented by chiropractic and naturopathic physicians is now more important than ever since the health of the American population is consistently and progressively declining: obesity and diabetes are “ever-growing” epidemics among children and adults,² infant mortality has recently increased for the first time in 40 years,³ and self-reported health status and health-related quality of life among adults are declining.⁴ In the 25 years between 1975 and 2000, the incidence of cancer increased significantly, and the number of people diagnosed with cancer is expected to double in the next several decades.⁵ Despite these negative health trends, America spends more on healthcare than does any other nation—an unprece-

dent \$1.55 trillion, which is roughly 15% of the US gross domestic product.⁶ From the perspective of cost-effectiveness, the medically-dominated American healthcare system delivers a very poor return on investment, and it appears that assertive wellness promotion and increased utilization of chiropractic and naturopathic healthcare may provide improved outcomes and decreased overall healthcare costs.^{7,8}

Numerous adverse effects are produced as a direct result of medical/pharmaceutical management of benign musculoskeletal pain. According to a 1998 review by Singh,⁹ “Conservative calculations estimate that approximately 107,000 patients are hospitalized annually for nonsteroidal anti-inflammatory drug (NSAID)-related gastrointestinal (GI) complications and at least 16,500 NSAID-related deaths occur each year among arthritis patients alone. The figures for all NSAID users would be overwhelming, yet the scope of this problem is generally under-appreciated.” More recently following the withdrawal of the arthritis drug rofecoxib (Vioxx) in late September 2004, Topol¹⁰ extrapolated that as many as 160,000 adverse cardiovascular events (including stroke, myocardial infarction, and death) may have resulted from the collusion of Merck’s intentional failure to withdraw what was known for years to be a dangerous drug, the FDA’s failure to enforce regulatory standards to protect the public, and the overutilization of Vioxx by the medical profession, which was well informed of the lethality of Vioxx for several years¹¹ before Merck’s confessionary and belated withdrawal of the drug. Soon thereafter, several other so-called “anti-inflammatory drugs” such as valdecoxib (Bextra),¹² celecoxib (Celebrex),¹³ and naproxen (Aleve)¹⁴ were likewise associated with excess cardiovascular injury and death. Although the advertising-induced feeding frenzy on Celebrex made it the most successful drug launch in US history with more than 7.4 million prescriptions written within its first 6 months,¹⁵

within 2 years of its release, evidence linking the drug to increased cardiovascular events (including death) was accumulating,¹¹ and the drug has since been linked to a wide range of adverse effects such as membranous glomerulopathy and acute interstitial nephritis,¹⁶ acute cholestatic hepatitis,¹⁷ and toxic epidermal necrolysis.¹⁸ When compared with placebo in cardiac surgery patients, Bextra/valdecoxib is associated with a 3-fold to 4-fold increased risk of heart attack, stroke, and death,¹⁹ and currently 7 million arthritis patients, many of whom are already at high risk for cardiovascular disease, are being treated with this drug.¹²

Increasingly aware of the negative effects of pharmaceutical management of musculoskeletal pain, patients and healthcare providers alike are looking to natural treatments and chiropractic healthcare^{20,21} with the hopes of avoiding the risks of iatrogenic disease, such as drug-induced renal failure,²² hepatotoxicity,²³ gastrointestinal ulceration and hemorrhage,²⁴ osteonecrosis,^{25,26} joint degeneration,^{27,28} hypertension,²⁸ myocardial infarction,¹¹ and premature death^{11,12} that are associated with the non-steroidal anti-inflammatory drugs (“NSAIDs”), non-NSAID analgesics such as acetaminophen, and the relatively new selective cyclooxygenase-2 inhibitors (cox-2 inhibitors, or “coxibs”). It is tragically paradoxical that many of the pharmaceutical drugs used for the suppression of arthritis symptoms and advertised as “arthritis relief” actually exacerbate joint destruction and chronic inflammation by interfering with the biosynthesis of the glycosaminoglycans that are essential components of joint cartilage while also promoting destruction of subchondral bone.^{25,26,27,28} This places chiropractic physicians in an ethical dilemma when helping patients who have been prescribed potentially dangerous medications by their medical doctors. On the one hand, chiropractic physicians are aware of the research showing that, for example, coxibs provide little clinical benefit while promoting increased cardiovascular mortality and other potentially lethal adverse effects. On the other hand, if a chiropractic physician advises discontinuation of the medication, he or she may be reprimanded for “practicing medicine.” It appears that chiropractic physicians will need to obtain limited prescription rights for the sake of helping protect their patients from iatrogenic and drug-induced disease. Given that chiropractic physicians are already duly trained in basic and clinical sciences sufficient for primary care, post-graduate certification courses in pharmacology would be sufficient if additional training is deemed necessary to obtain these prescription rights.

The first two articles in this series reviewed the importance of diet and fatty acids in the alleviation of pain and inflammation. This article reviews the most commonly used and well-researched nutritional and botanical interventions for the treatment of pain and inflammation,

namely vitamin D, glucosamine and chondroitin sulfate, niacinamide, vitamin D, proteolytic enzymes, Devil’s Claw (*Harpagophytum procumbens*), Willow bark (*Salix* spp), and Boswellia (*Boswellia serrata*). This review will provide chiropractic and naturopathic physicians with clinically useful information to help their patients attain improved health and well-being. Osteoarthritis and chronic low-back pain, the two most prevalent musculoskeletal afflictions, will serve as prototypes for this discussion.

SELECTED NUTRITIONAL AND BOTANICAL THERAPEUTICS FOR THE ALLEVIATION OF JOINT PAIN AND INFLAMMATION

Subsequent to the overall health improvement and anti-inflammatory benefits provided by the supplemented Paleo-Mediterranean diet described previously, many patients who require additional anti-inflammatory interventions can be safely and effectively treated with the following phytonutraceuticals, each of which is supported by experimental and clinical data in humans. Mechanism(s) of action, indications, contraindications, dosage, and common drug interactions (if any) are listed for each.

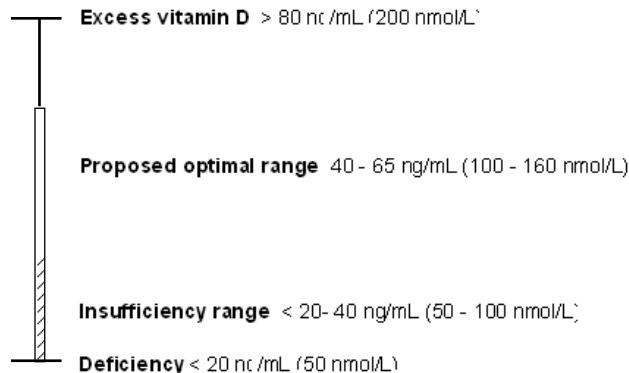
Glucosamine and chondroitin sulfate: Glucosamine and chondroitin are the “building blocks” from which cartilage is built and oral supplementation is intended to enhance cartilage anabolism and to thus counteract the enhanced cartilage catabolism seen in destructive arthritic processes. Clinical trials with glucosamine and chondroitin sulfates have shown consistently positive results in clinical trials involving patients with osteoarthritis of the hands, hips, knees, temporomandibular joint, and low-back.^{29,30,31,32,33,34} For example, glucosamine sulfate was superior to placebo for pain reduction and preservation of joint space in a 3-year clinical trial in patients with knee osteoarthritis.³⁶ Arguments against the use of glucosamine due to inflated concern about inefficacy or exacerbation of diabetes³⁷ are without scientific merit^{38,39} as evidenced by a 90-day trial⁴⁰ of diabetic patients consuming 1500 mg of glucosamine hydrochloride with 1200 mg of chondroitin sulfate which showed no significant alterations in serum glucose or hemoglobin A1c and by the previously cited 3-year study which found significant clinical benefit and no adverse effects on glucose homeostasis. The adult dose of glucosamine sulfate is generally 1500-2000 mg per day in divided doses, and the dose of chondroitin sulfate is approximately 1000 mg daily. Both treatments are safe for multiyear use, and rare adverse effects include allergy and nonpathologic gastrointestinal upset. Clinical benefit is generally significant following 4-6 weeks of treatment and is maintained for the duration of treatment. In contrast to coxib and other mislabeled “anti-inflammatory” drugs that consistently elevate the incidence of cardiovascular disease,

death, and other adverse effects, supplementation with chondroitin sulfate appears to safely reduce the pain and disability associated with osteoarthritis while simultaneously reducing incidence of cardiovascular morbidity and mortality.^{41,42} In a study with animals that spontaneously develop atherosclerosis,⁴³ administration of chondroitin sulfate appears to have induced regression of existing atherosclerosis. In a six-year study with 120 patients with established cardiovascular disease, 60 chondroitin-treated patients suffered 6 coronary events and 4 deaths compared to 42 events and 14 deaths in a comparable group of 60 patients receiving “conventional” therapy; chondroitin-treated patients reported enhancement of well-being while no adverse clinical or laboratory effects were noted during the 6 years of treatment.⁴⁴

Vitamin D (cholecalciferol): Vitamin D insufficiency is epidemic in the United States and is extremely prevalent (>90%) among patients with chronic musculoskeletal pain⁴⁵ limb pain,⁴⁶ and low-back pain.⁴⁷ The mechanism by which this pain is produced has been clearly elucidated: 1) vitamin D deficiency causes a reduction in calcium absorption, 2) production of parathyroid hormone (PTH) is increased to maintain blood calcium levels, 3) PTH results in increased urinary excretion of phosphorus, which leads to hypophosphatemia, 4) insufficient calcium phosphate results in deposition of unmineralized collagen matrix on the endosteal (inside) and periosteal (outside) of bones, 5) when the collagen matrix hydrates and swells, it causes pressure on the sensory-innervated periosteum resulting in pain.⁴⁸ In patients with vitamin D deficiency, oral supplementation with vitamin D clearly produces anti-inflammatory benefits,^{49,50} and treatment with vitamin D can safely lead to dramatic reductions in musculoskeletal pain in a large percentage of patients.^{46,47} Routine annual measurement of vitamin D status should be the standard of care⁵¹ since failure to diagnose vitamin D deficiency and to provide adequate replacement doses are both ethically questionable and scientifically unjustifiable in light of the low cost, manifold benefits, rare adverse effects, and high prevalence of vitamin D deficiency.^{52,53} Physiologic requirements are approximately 4,000 IU per day in men⁵⁴ and can only be achieved with high-dose oral supplementation or full-body sun exposure on a frequent or preferably daily basis. As reviewed in the recent monograph by Vasquez et al,⁵⁵ relative contraindications include the use of thiazide diuretics or presence of a vitamin D hypersensitivity syndrome such as primary hyperparathyroidism, adrenal insufficiency, hyperthyroidism, hypothyroidism, or granulomatous disease such as sarcoidosis, Crohn’s disease, or tuberculosis). Serum calcium is periodically monitored in patients receiving moderate doses of vitamin D (adult range 4,000 – 10,000 IU per day), since hypercalcemia is the best laboratory indicator of vitamin D excess.

High doses of vitamin D (up to 100,000 IU per day) have been safely used during pregnancy^{56,57} periodic testing of serum calcium is required to monitor and for hypercalcemia. Vitamin D supplementation has been proven effective in the treatment of hypertension, depression, migraine headaches, polycystic ovary syndrome and in the prevention of cancer and type-1 diabetes.⁵⁵

Figure 2. Normal and optimal ranges for serum 25(OH) vitamin D levels based on current research. Used with permission from Vasquez A. Integrative Orthopedics. (OptimalHealthResearch.com): 2004



Proteolytic enzymes: Oral administration of proteolytic enzymes (such as pancreatin, bromelain, papain, trypsin and alpha-chymotrypsin) for therapeutic purposes is well established on physiologic, biochemical, and clinical grounds, and a brief review of their historical use is warranted. One of the first experimental studies was published by Beard in 1906 in the *British Medical Journal* wherein he showed that proteolytic enzymes significantly inhibited tumor growth in mice with implanted tumors,⁵⁸ and a year later in that same journal, Cutfield⁵⁹ reported tumor regression and other objective improvements in a patient treated with proteolytic enzymes. In the American research literature, anti-cancer effects of proteolytic enzymes were reported during this same time in the *Journal of the American Medical Association* in anecdotal case reports of patients with fibrosarcoma,⁶⁰ breast cancer,⁶¹ and head and neck malignancy⁶²—all of whom responded positively to the administration of proteolytic enzymes; no adverse effects were seen. Although nearly a century would pass before Beard’s study and results were replicated with modern techniques,^{63,64} by now it is well established that orally administered proteolytic enzymes are well absorbed from the gastrointestinal tract into the systemic circulation^{65,66} and that the anti-tumor, anti-metastatic, anti-infectious, anti-inflammatory, analgesic, and anti-edematous actions result from synergism between a variety of mechanisms of action, including the dose-dependent stimulation of reactive oxygen species production and anti-cancer cytotoxicity in human neutrophils,⁶⁷ a pro-differentiative effect,⁶⁸

reduction in PG-E2 production,⁶⁹ reduction in substance P production,⁷⁰ modulation of adhesion molecules and cytokine levels,⁷¹ fibrinolytic effects and a anti-thrombotic effect mediated at least in part by a reduction in 2-series thromboxanes.⁷² Unfortunately, enthusiasm for the enzyme treatment of cancer waned prematurely when trypsin was judged to not be a “miracle cure”, when the mechanism of action could not be determined, and as enthusiasm surrounding drug and radiation treatments grabbed the attention of allopaths.⁷³ However, modern controlled clinical trials in cancer patients have established the value of enzyme therapy, which produces important clinical benefit (e.g., symptom reduction and prolonged survival) for little cost and with negligible adverse effects.^{74,75,76} Research in other clinical applications for proteolytic enzymes has consistently shown benefit when properly formulated and manufactured preparations are administered appropriately in the treatment of cellulitis, diabetic ulcers, sinusitis, and bronchitis.⁷⁷ For example, in a double-blind placebo-controlled trial with 59 patients, Taub⁷⁸ documented that oral administration of bromelain significantly promoted the resolution of congestion, inflammation, and edema in patients with acute and chronic refractory sinusitis; no adverse effects were seen in any patient.

When not treating patients with cancer or infectious disease, chiropractic and naturopathic physicians today use these enzymes mostly for the treatment of inflammatory and injury-related disorders. Reporting from the Tulane University Health Service Center, Trickett⁷⁹ reported that a papain-containing preparation benefited 40 patients with various injuries (e.g., contusions, sprains, lacerations, strains, fracture, surgical repair, and muscle tears); no adverse effects were seen. In a recent open trial of patients with knee pain, Walker et al⁸⁰ found a dose-dependent reduction in pain and disability as well as a significant improvement in psychological well-being in patients consuming bromelain orally. Most of the studies reviewed by Brien et al⁶⁹ were suggestive of a positive benefit in patients with knee osteoarthritis, but inadequate dosing clearly prohibited the attainment of optimal results. Bromelain also attenuates experimental contraction-induced skeletal muscle injury,⁸¹ reduces production of hyperalgesic PG-E2 and substance P, is generally effective in the amelioration of trauma-induced injury, edema, and inflammation, and is practically non-toxic.⁷⁰ Although bromelain may be used in isolation, enzyme therapy is generally delivered in the form of polyezyme preparations containing pancreatin, bromelain, papain, trypsin and alpha-chymotrypsin.

Niacinamide: Niacinamide is a form of vitamin B3 that was first shown to be highly effective in the treatment of

osteoarthritis by Kaufman more than 50 years ago.⁸² Furthermore, Kaufman’s documentation of an “anti-aging” effect of vitamin supplementation in general and niacinamide therapy in particular⁸³ is consistent with recent experimental data demonstrating rapid reversion of aging phenotypes by niacinamide through possible modulation of histone acetylation.⁸⁴ A recent double-blind placebo-controlled repeat study found that niacinamide therapy improved joint mobility, reduced objective inflammation as assessed by ESR, reduced the impact of the arthritis on the activities of daily living, and allowed a reduction in medication use.⁸⁵ While the mechanism of action is probably multifaceted, inhibition of joint-destroying nitric oxide appears to be an important benefit.⁸⁶ The standard dose of 500 mg given orally 6 times per day is more effective than 1,000 mg 3 times per day. Hepatic dysfunction is rare when daily doses are kept below 3,000 mg per day, yet Gaby⁸⁷ suggests measurement of liver enzymes after 3 months of treatment and yearly thereafter. Antirheumatic benefit is generally significant following 2-6 weeks of treatment, and patients may also notice an anxiolytic benefit, which is probably due to the binding of niacinamide to GABA/benzodiazepine receptors.⁸⁸

Boswellia (*Boswellia serrata*): *Boswellia* shows anti-inflammatory action via inhibition of 5-lipoxygenase with no apparent effect on cyclooxygenase. A recent clinical study showed that *Boswellia* was able to reduce pain and swelling while increasing joint flexion and walking distance in patients with osteoarthritis of the knee.⁸⁹ While reports from clinical trials published in English are relatively rare, a recent abstract from the German medical research⁹⁰ stated, “In clinical trials promising results were observed in patients with rheumatoid arthritis, chronic colitis, ulcerative colitis, Crohn’s disease, bronchial asthma and peritumoral brains edemas.” Additional recent studies have confirmed the effectiveness of *Boswellia* in the treatment of asthma⁹¹ and ulcerative colitis.⁹² Minor gastrointestinal upset has been reported. Products are generally standardized to contain 37.5–65% boswellic acids, which are currently considered the active constituents with clinical benefit. The target dose is approximately 150 mg of boswellic acids thrice daily; dose and number of capsules/tablets will vary depending upon the concentration found in differing products. Lower doses are effective when used as a part of a comprehensive, multicomponent treatment plan.

Devil’s Claw (*Harpagophytum procumbens*): *Harpagophytum* has a long history of use in the treatment of musculoskeletal complaints, and recent clinical trials have substantiated its role as a moderately effective analgesic suitable for clinical utilization. At least 12 clinical trials have been published on the use of *Harpagophytum* in

the treatment of musculoskeletal pain, and all trials have found the botanical to be clinically valuable and with adverse effects comparable to placebo.⁹³ *Harpagophytum*'s clinical benefit appears to derive chiefly from its analgesic effect, since administration of the herb does not alter eicosanoid production in humans. In patients with osteoarthritis of the hip and knee, *Harpagophytum* is just as effective yet safer and better tolerated than the drug diacerein.^{94,95} In a study involving 183 patients with low-back pain, *Harpagophytum* was found to be safe and moderately effective in patients with "severe and unbearable pain" and radiating pain with neurologic deficit.⁹⁶ Most recently, *Harpagophytum* was studied in a head-to-head clinical trial with the formerly popular but dangerous selective cox-2 inhibitor Vioxx (rofecoxib); the data indicate that *Harpagophytum* was safer and at least as effective.⁹⁷ About 8% of patients may experience diarrhea or other mild gastrointestinal effects, and fewer patients may experience dizziness; *Harpagophytum* may potentiate anticoagulants. Treatment should be continued for at least 4 weeks, and many patients will continue to improve after 8 weeks from the initiation of treatment.⁹⁸ Products are generally standardized for the content of harpagosides, with a target dose of at least 30 and up to 60 mg harpagoside per day. However, the whole plant is considered to contain effective constituents, not only the iridoid glycosides. Chrubasik⁹⁹ noted that while *Harpagophytum* appears to be safe and moderately effective for the treatment musculoskeletal pain, different proprietary products show significant variances in potency and clinical effectiveness. Data suggest that *Harpagophytum* is better than placebo and at least as good as commonly used NSAIDs, suggesting that *Harpagophytum* should be clinically preferred over NSAIDs due to the lower cost and what appears to be greater safety.

Willow bark (*Salix spp*): In a double-blind placebo-controlled clinical trial in 210 patients with moderate/severe low-back pain (20% of patients had positive straight-leg raising test), extract of willow bark showed a dose-dependent analgesic effect with benefits beginning in the first week of treatment.¹⁰⁰ In a head-to-head study of 228 patients comparing willow bark (standardized for 240 mg salicin) with Vioxx (rofecoxib), treatments were equally effective yet willow bark was safer and 40% less expensive.¹⁰¹ Actions of willow bark are manifold including anti-oxidative, anti-cytokine, along with cyclooxygenase- and lipoxygenase-inhibiting effects. A non-purified extract of the phytomedicinal is required for full clinical benefit. The daily dose should not exceed 240 mg of salicin, and products should include other components of the whole plant. Except for rare allergy, no adverse effects are known, yet use during pregnancy and with anti-coagulant medication is discouraged.

SPINAL MANIPULATION: MECHANISMS OF ACTION AND SYNERGISM WITH NUTRITIONAL/BOTANICAL INTERVENTIONS

Select nutritional interventions as surveyed in this paper may have enhanced effects and benefits when combined with spinal manipulative therapy. For example, enhanced respiratory burst clearly carries both antitumor and antimicrobial benefits, and this physiologic effect can be induced by oral consumption of proteolytic enzymes as well as by chiropractic spinal manipulative therapy.¹⁰² Likewise, we would expect synergism between spinal manipulative therapy¹⁰³ and nutritional¹⁰⁴ and botanical (e.g., *Boswellia*) interventions in the treatment of asthma, particularly since these treatments are mediated primarily via different mechanisms—namely the neurophysiologic inhibition of neurogenic inflammation and the biochemical reduction in pro-inflammatory mediators such as leukotrienes, respectively. As a final example, synergism would be expected in the treatment of low-back pain when spinal manipulation, therapeutic exercise, proprioceptive retraining, oral vitamin D supplementation, and botanical medicines such as *Harpagophytum* and Willow Bark are used together in holistic, integrative, multicomponent treatment plans.¹⁰⁵ Taken together, these data form an integrative model that incorporates and mechanistically validates the chiropractic "triad of health" which appreciates the interconnectedness of physical, biochemical, and neurologic aspects of human physiology.¹⁰⁵

CONCLUSIONS

The chiropractic profession continues to develop and mature over time and with advances in research that further our understanding of health and disease and the value of diet, nutrition, exercise, spinal manipulation and other natural therapeutics. In contrast to our allopathic counterparts, chiropractic and naturopathic physicians are the only healthcare providers trained to consider each patient as an integrated being and to give specific attention to the physiological and biochemical aspects of health and disease, including structural, spinal, musculoskeletal, neurological, vascular, nutritional, emotional and environmental relationships.¹⁰⁶ The anti-inflammatory and analgesic nutritional and botanical medicines described in this review are generally appropriate for the treatment of inflammatory and degenerative musculoskeletal conditions, and they comprise an attractive alternative to the too-often lethal effects of pharmacologic anti-inflammatory and anti-rheumatic drugs.

If we consider that medical/surgical interventions result in an excess of 110,000 – 225,000 iatrogenic American deaths each year,^{107,108} we could reasonably conclude that

undue restriction of chiropractic and naturopathic physicians to practice preventive healthcare and the discriminatory legal and financial barriers that inhibit patients from accessing alternatives to drugs and surgery ultimately deny patients' access to safe, effective, cost-effective, empowering, affordable healthcare by simultaneously restricting them to interventions that carry greater risk for harm and greater financial expense. With ever-increasing costs and ever-worsening health outcomes, the American healthcare system is destined for collapse unless we change the model upon which our healthcare system is founded—namely the belief that surgery and chemical drugs are the solutions to chronic diseases induced by nutritional deficiencies, oxidative stress, impaired detoxification, defects in fatty acid metabolism, altered gastrointestinal function, and neuromusculoskeletal dysfunction. We have reached an irrevocable impasse in which our current healthcare system dominated by drugs and surgery is no longer consistent with the balance of scientific research.¹⁰⁹ The time has come for patients and practitioners of natural healthcare to demand change and equitable access within the healthcare arena.

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