Institute for Science in Medicine

WHITE PAPER

CHIROPRACTIC

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Institute for Science in Medicine (ISM) is an international, educational and public-policy organization comprised of health care professionals, scientists, and researchers who agree that the best science available should be used to determine health policy and to establish a standard of care that both protects and promotes the public health. We necessarily oppose policies which erode a science-based standard of care and thereby significantly expose the public to fraudulent, worthless, or harmful medical practices and products.

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Chiropractic is a licensed health care profession in the United States. Its core principle is that misalignments ("subluxations") of the spinal bones (vertebrae) cause ill health and disease and that detecting and correcting them can relieve symptoms and improve overall health. There is no scientific evidence that chiropractic subluxations exist or that their purported "detection" or "correction" confers any health benefit. In spite of this, chiropractors use a broad spectrum of methods that purport to diagnose and treat subluxations and claim such treatments benefit the patient's health.

Background

Origins

Daniel David Palmer, a self-described "magnetic healer" with no scientific background or medical training, is said to have "discovered" chiropractic in 1895 after he struck the spine of a deaf janitor and claimed it restored the man's hearing. Palmer concluded that slightly misaligned vertebrae ("subluxations") interfered with the flow of "Innate Intelligence," from the brain through the spinal nerves, causing 95% of all disease.[1] "Adjustment" of these subluxations put the supposedly misaligned vertebrae back into place and removed this interference, allowing the body to heal itself.[1,2]

The "Subluxation" Today

Palmer's ideas were simply a variation of "vitalism," a long-discredited concept that postulates a nonmaterial "life force," yet they remain the central tenet of chiropractic to this day. It is difficult to generalize about chiropractic practice because it is not grounded in a coherent science-based system of knowledge unlike, for example, medicine, dentistry, or pharmacy. Chiropractors cannot agree on what subluxations are, how they can be located, or how they should be treated. This has resulted in dozens of nonvalidated diagnostic and treatment modalities,[3] inconsistent terminology,[3,4] and a dearth of evidence-based practice guidelines.[5]

Although some have equated Palmer's vitalistic "innate intelligence" with the flow of nerve impulses transmitted by spinal nerves, the bones of the spinal column cannot be displaced sufficiently—without breakage—to impinge on nerves.[6] Even if there is some form of nerve impingement, the chiropractic claim that this can block "nerve flow" and affect organ function is based on a simplistic and false view of the nervous system.

Attempts by chiropractors to further modify the concept of the subluxation in the face of evidence that it does not exist have led to definitions so implausible and vague as to be incomprehensible.[3,4] Part of this effort includes renaming the term *subluxation*. Some 100 different terms have been used, including manipulable lesion, vertebral subluxation complex, joint dysfunction, and functional spinal lesion.[7]

These names and definitions are nothing more than variations on Palmer's subluxation and depend upon a preconceived and unsubstantiated notion that some sort of spinal pathology is present. It is instructive to note that neither the existence nor clinical significance of the chiropractic subluxation is recognized by the scientific medical community.

Whatever it is called and however defined, chiropractors remain devoted to the subluxation concept. The economic success of chiropractors largely depends on having patients believe that their chiropractor has detected and can correct the patient's subluxations, and that if the subluxations are ignored the patient's health will suffer. The Council on Chiropractic Education, the accrediting agency for US chiropractic colleges, requires competency in subluxation diagnosis and treatment as part of accredited Doctor of Chiropractic programs.[8] A 2010 report from the National Board of Chiropractic Examiners (NBCE) states that "the specific focus of chiropractic practice is known as the *chiropractic subluxation* or *joint dysfunction*."[9] The NBCE clinical examination includes detection and correction of a subluxation.[10] According to a 2003 survey of North American chiropractors, 88% thought that the term vertebral subluxation complex should be retained by the chiropractic profession.[11] They also thought that the subluxation is a significant contributing factor in 62% of visceral ailments. Almost 90% thought that the adjustment should not be limited to musculoskeletal conditions.[11]

This remains true despite the fact that the lack of evidence underpinning the subluxation is widely admitted in the chiropractic literature.[12-17] This lack of evidence prompted the British General Chiropractic Council, which governs the practice in Great Britain, to issue guidance to chiropractors that the vertebral subluxation complex is "is taught only as an historical concept," that "there is no clinical research base to support the belief that it is the cause of disease or health concerns" and essentially stating that it is inappropriate to make such claims in advertising or practice.[18]

Types of Practice

Chiropractors can be divided into roughly two groups:

- *Straight* chiropractors: Practice is devoted almost exclusively to the detection and correction of subluxations and adheres to the traditional Palmerian notion that these subluxations block "nerve flow" between the brain and bodily organs.[3,19]
- *Mixer* chiropractors: Practice includes some form of subluxation-based belief system. Also includes standard interventions, such as physical therapy and exercise advice. Employ other unproven and implausible treatments, such as homeopathy, acupuncture, and "cold" lasers.[3,20,21]

A small percentage of chiropractors have renounced the subluxation altogether and use standard physical therapy for musculoskeletal problems. Some of them formed an organization, the National Association for Chiropractic Medicine, which has since been disbanded, although their website is still online.[22]

Chiropractic Treatment, Education, and Training

The Council on Chiropractic Education (CCE), a private organization controlled solely by chiropractors, is designated by the US Department of Education as the accrediting agency for all chiropractic colleges.[23] Federal law requires that all college accrediting agencies ensure compliance with standards covering financial stability, staffing levels, transparency of operations, record-keeping, and the like.[24] However, there is no requirement that what is taught be evidence-based or in accord with generally accepted scientific principles.

Although chiropractors are permitted by state law to call themselves "doctor," their education and training is inferior to that of other doctoral-level health professions, such as medical doctors and dentists. Chiropractic is taught exclusively in fifteen small independent private colleges.[25] No US chiropractic school is affiliated with any other Carnegie Classification Baccalaureate, Master's or Doctorate Granting College or University, nor has any attained Research University status.[26] All efforts to become part of a university have failed.[3] Enrollment in chiropractic colleges decreased almost 40% between 1991 and 2002;[3] one California chiropractic college closed its doors in 2011 because of declining enrollment.[27]

Admission to chiropractic school does not require an undergraduate degree. Only a 2.5 on a 4.0 scale average in 90 undergraduate hours, including some science courses, is necessary.[28] Unlike medical and other professional graduate programs, there is no admissions test.[28] Students must pass the National Board of Chiropractic Examiners examination to practice.

Chiropractic students have relatively little experience in actual patient care prior to going into practice. For the vast majority of chiropractic students, the only supervised clinical experience takes place during chiropractic college, usually in small campus clinics where the range of problems they encounter and manage is narrow.[1] Chiropractors are not required to do any post-degree training, and chiropractic residencies are rare. Even then, what chiropractors call a "residency" is not the equivalent of a medical specialty residency,[29,30] where an additional three to seven years of postgraduate training is necessary to become a primary-care physician or a specialist.[31]

The American Chiropractic Association sanctions chiropractic "specialties" in areas such as pediatrics, internal medicine, and neurology.[32] These specialties adopt the nomenclature of medical specialties, such as "Diplomate," "Fellow," and "Board Certified," but without the equivalent education and training necessary for medical specialization. Except for radiology,[29] these do not require residency training as a prerequisite. Rather, between 150 hours and 360 hours of weekend classes, or on-line or DVD materials are a prerequisite to taking one or more exams. Some programs require a case study or project in addition. Very little, if any, actual patient care is required.[33-43]

Regulation of Chiropractic Practice

All of the 50 US states currently license chiropractors and define the practice of chiropractic, either explicitly or implicitly, as the detection and correction of subluxations and assume that this benefits human health.[44] In the majority of states, chiropractors are regulated by Boards consist-

ing of practicing chiropractors, although some states include public members. These Boards usually have the power, within the limits of their statutory authority, to enact administrative rules governing the practice of chiropractic.

New Mexico recently created a new category of chiropractic practice called the "Advanced Practice Chiropractic Physician," which can be attained by an additional 90 hours of training and taking an exam. This status includes limited prescribing privileges, although a number of the authorized drugs are generally considered substandard in medical practice.[45,46]

Utilization of Chiropractic Services

Chiropractors held about 52,600 jobs in the US in 2010. The US Department of Labor estimates that by 2020 this number will increase by 14,900.[47] However, there is a downward trend in the percentage of US adults using chiropractic services, which decreased from 9.9% to 5.6% between 1997 and 2006.[48,49] These patients spent $5.9 billion on chiropractic care in 2006.[49]

Public and private health insurance coverage of chiropractic services is widespread.[49] This is mainly due to mandates enacted by state legislatures. Inclusion of chiropractic services tends to increase insurance premium costs[50] and is strongly associated with high-frequency use of chiropractic services.[51] Taxpayer-funded coverage of chiropractic services includes Medicare, which, as required by the Social Security Act, covers only "active/corrective manual manipulations of the spine to correct subluxations."[52]

Chiropractic Diagnosis and Treatment Overview

If subluxations were the underlying cause of disease, it would follow that spinal adjustments could treat the gamut of health problems and chiropractic's scope would be limitless. Asthma, ear infections, painful periods, bedwetting, colic, learning disabilities, autism, and ADHD are among the conditions commonly mentioned in chiropractic writings.[53] The American Chiropractic Association, the largest chiropractic trade association in the US, claims that chiropractors can provide management of "a broad variety of conditions," such as cardiovascular disease, autoimmune disease, gastrointestinal disorders, and "other conditions and disorders."[54] In the Ohio Northern University survey, almost 90% of respondents stated that adjustments should not be limited to musculoskeletal conditions.[11] There was substantial agreement that adjustments cause improvements in cases of dysmenorrhea (84.2%), otitis media (77.0%), and asthma (allergic type) (77.5%).[11] This view prevails even though chiropractic adjustments have not been proven effective for any non-musculoskeletal condition.[55-58] The most recent large-scale survey of chiropractic practice reveals that chiropractors commonly employ subluxation-based diagnosis and treatment for both musculoskeletal and nonmusculoskeletal conditions.[9]

Thus, although the public may perceive chiropractors as "back doctors," many see themselves otherwise.[13] Chiropractors are, in their own view, primary care physicians who treat the entire population—neonate to geriatric patient—for a broad range of conditions and diseases.[9,11,15,59-62] The 2012 accreditation standards of the Council on Chiropractic Education state that the goal of chiropractic education is to prepare graduates to "practice primary health

care as a portal-of-entry provider for patients of all ages and genders."[28] A recent article in a leading chiropractic trade publication suggests that chiropractors are "conservative primary care physicians" able to diagnose and manage a wide range of disease and conditions, including diabetes, heart disease, and depression.[62]

Because, according to chiropractors, subluxations can be entirely asymptomatic, many recommend periodic "spinal checkups" for everyone, including children. These visits, commonly referred to as "maintenance care" or "wellness care," include checking for and adjusting subluxations.[3,63-66] One survey reported that 98% the responders recommend maintenance care to 78.7% of their patients (including children and adolescents), for an average of 14.4 visits annually.[67] The majority of those surveyed considered maintenance helpful to the respiratory, gastrointestinal, cardiovascular, and reproductive systems.[67]

In addition to a confusing array of names and definitions, chiropractors use the term "manipulation" differently than do other health care professionals. Spinal manipulation is a manual therapy employed by a number of health care professionals, including physical therapists, medical doctors, osteopaths and chiropractors.[68] Its purpose, when properly employed, is to reduce pain, increase joint range of motion, and address other physical manifestations of joint impairment.[68] Chiropractors claim that manipulation is safer in their hands than those of other professionals, but there is no scientific evidence to back this assertion.[68]

Current evidence shows that spinal manipulation is effective for certain types of back pain, although not necessarily superior to other methods.[57,69] It is beyond the scope of this Policy Statement to review the evidence for or against spinal manipulation when properly employed as a manual therapy for musculoskeletal conditions, as this use is not a matter of concern to the Institute for Science in Medicine. It is important to understand, however, that only chiropractors use spinal manipulation as a form of "adjustment," that is, as a treatment for "subluxations." This is never legitimate because the chiropractic subluxation does not exist. This distinction cannot be overemphasized: even if a chiropractor claims to be treating, for example, back pain with spinal manipulation, that use is legitimately indicated only if the diagnosis is supported by evidence-based criteria that indicate that manipulation may help. Subluxation-based diagnoses provide no legitimate basis for manipulating spines.

Unscientific Methods

The lack of an underlying rationale for chiropractic diagnosis and treatment has led to development of numerous nonvalidated techniques. Many chiropractors employ methods that are unsubstantiated, implausible, and not based upon the body of knowledge related to health, disease, and health care that has been widely accepted by the scientific community. These approaches include:

Applied kinesiology. A system of diagnosis and treatment based on the notion that every organ dysfunction is accompanied by a specific muscle weakness, which enables diseases to be diagnosed through muscle-testing procedures. Its practitioners also claim that nutritional deficiencies, allergies, and other adverse reactions to food substances can be identified by placing substances in the mouth or using glass vials that the patient holds. "Good" substances will make

specific muscles stronger, whereas "bad" substances will cause specific weaknesses. "Treatment" may include special diets, food supplements, acupressure, and spinal manipulation.[70]

Hair analysis to assess nutritional status. A small sample of hair is sent to a laboratory that measures the content of minerals on or in the hair and recommends products that supposedly correct nutrient "imbalances." Hair mineral content does not reflect body stores, and nutritional recommendations based on hair analysis are worthless.[71]

Activator methods. A diagnostic and treatment system centered on the idea that leg-length analysis can identify "subluxations" and determine when to adjust and when not to adjust the spine. Proponents also claim, "Regular spinal adjustments can become your body's line of defense against illness, disease, and pain."[72]

Meric system. Chiropractic system based on the idea that specific spinal joints are associated with specific organs and that a wide variety of diseases can be treated by adjusting the specified vertebrae.[73] (See Figure 1 below)

Electrodermal testing. This is done with a device that measures electrical resistance of the skin to a tiny current generated by the device. The software is programmed to diagnose the gamut of disease and recommend supplement or homeopathic products. The entire procedure is bogus.[74]

Inappropriate prescribing. Many chiropractors prescribe dietary supplements, glandulars, enzymes, and homeopathic products that have no plausible rationale and not been proven effective for their intended purposes. Many also sell the products to their patients.[3,9,21,45,46]

Dangers

Delay of effective medical treatment. Failure to receive timely diagnosis and treatment of a medical condition by a qualified professionals adequately trained in differential diagnosis of all bodily systems and with sufficient knowledge and scope of practice to treat all human conditions and diseases.[75]

Excessive Radiation. Indiscriminate use of X-rays, including use of full spine X-rays in identifying "subluxations," thereby exposing patients to unnecessary radiation.[76-79] One chiropractic practice guideline recommends the *routine* use of AP and Lateral Full Spine radiographic views for determination of the "vertebral subluxation."[79]

Opposition to vaccination. Chiropractors and their organizations have traditionally opposed vaccination, a view that has not changed in accordance with the overwhelming evidence supporting the safety and efficacy of vaccination.[1,80] A recent study of Washington State insurance records revealed that toddlers who saw chiropractors were significantly less likely to have been vaccinated against measles/mumps/rubella, chickenpox, or the flu in accordance with the recommended schedule.[81] The International Chiropractic Pediatric Association (ICPA) solicits funds for an anti-vaccination organization and employs anti-vaccination speakers at its conferences.[82,83]

Artery dissection and stroke. It is generally recognized in the medical profession that there is a small risk of stroke and death from forceful rotation with the neck fully extended, as is em-

Figure 1.

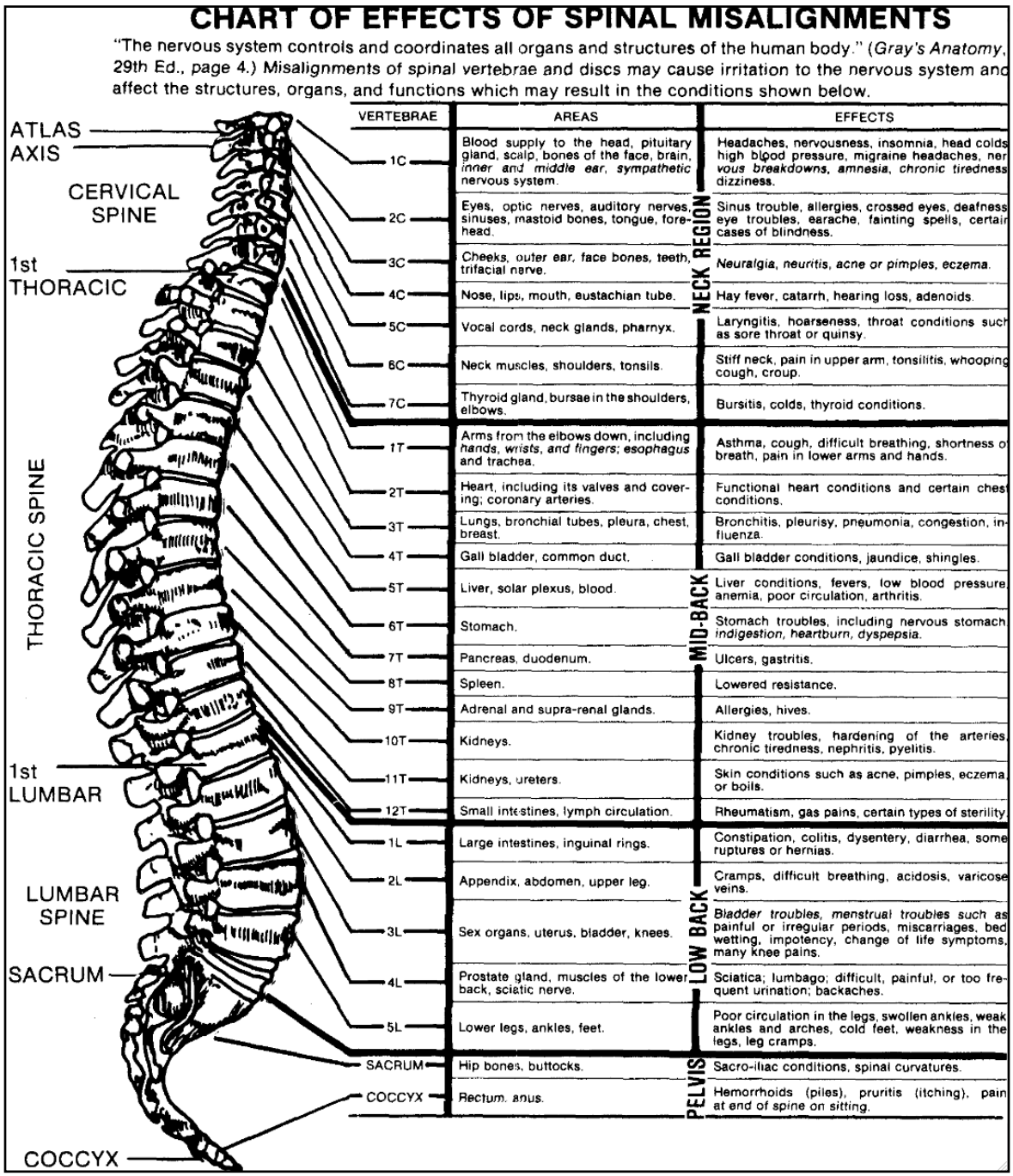

Chart from a chiropractic brochure. Many chiropractors use charts like this to reinforce the idea that spinal problems are a major cause of disease. This chart claims that "spinal misalignments" can cause more than 100 health problems, including allergies, amnesia, crossed eyes, deafness, gallbladder conditions, hernias, jaundice, and pneumonia. Simpler charts showing how nerves connect from the spine to the body's organs are used to assert that regular spinal care is essential for good health.

ployed in chiropractic cervical manipulation, which can cause injury to the arteries supplying blood to the brain.[84-93] Based on a review of Canadian health insurance claims, chiropractors claim that patients who suffered a stroke following chiropractic cervical manipulation actually had a vertebral artery dissection already in progress when they visited the chiropractor.[94] However, this study does not appear to have altered the view of anyone other than chiropractors that cervical manipulation can cause arterial dissection and subsequent stroke. Given the fact that manipulation to "adjust" a "subluxation" is never appropriate, any risk—no matter how small—is unjustifiable.

Wasted Health Resources. Whether payment is out-of-pocket or covered by insurance, diagnosis and treatment of the chiropractic subluxation adds a substantial burden to health care costs with no return in terms of benefit.

Poor Risk/Benefit Ratios. In addition to arterial dissection, stroke and death, spinal manipulation can cause mild to moderate transient adverse effects, such as pain, headache and fatigue.[55,95] When inappropriately performed as a means of "adjusting" the "subluxation," the total lack of benefit cannot justify any risk, no matter how small.

Ethics violations. Well-established ethical principles of personal autonomy, informed consent, and beneficence are violated when patients are subject to treatments with no possible benefit to their health.[96]

Policy Concerns

All professionals who hold themselves out as qualified to manage health problems should respect and adhere to the same standards of science-based practice. Although most chiropractors fail to do this, government policies and practices perpetuate their delivery of substandard and sometimes dangerous care. The following policy areas urgently need attention.

Chiropractic practice acts. Although their terminology is inconsistent, all state chiropractic practice acts presently allow subluxation "detection" and "correction" and permit chiropractors a broad range of unscientific and irrational practices. In addition, regulation of chiropractors is largely left to themselves.

Insurance coverage. State and federal laws require insurance programs to pay for chiropractic care, much of which fails to meet basic tests of scientific plausibility and effectiveness. The Social Security Act, for example, includes coverage for treating subluxations.

Chiropractic education. The US Department of Education permits an agency controlled by chiropractors to govern chiropractic's educational system. This allows perpetuation of untenable practices.

Lack of public awareness. The public is largely unaware of the chiropractic's shortcomings. Government agencies are silent about this, while licensing and mandatory insurance laws lend an imprimatur of government approval.

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