

History and Overview of Theories and Methods of Chiropractic

A Counterpoint

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Spinal manipulation has been used for its therapeutic effects for at least 2500 years. Chiropractic as we know it today began a century ago in a simplistic manner but has developed into a well-established profession with 33 colleges throughout the world. During the initial, bumpy years, many people thought it had little more value than a placebo. Nevertheless, there have always been satisfied recipients of chiropractic care during the years, and the profession slowly gained prominence – mostly by word of mouth. More recently, personal opinions based on isolated incidents have given way to the results of numerous clinical and basic science studies, primarily regarding low back pain. As of 2002, 43 randomized trials of spinal manipulation for low back pain had been published with 30 showing more improvement than with the comparison treatment, and none showing it to be less effective. Other studies have shown that chiropractic care compared with medical care is safer, costs no more and often costs much less, and has consistently greater patient satisfaction for treatment of similar conditions. Consequently, there is now better public and professional opinion of chiropractic with coverage by insurance companies and government agencies. That trend is likely to continue.

There is no question that chiropractic has been, and continues to be more controversial than traditional medicine, although less so now than in the past. There was a time when numerous chiropractors were prosecuted and jailed under the pretense of being a threat to society, for practicing medicine without a license because many states had no provisions for licensure of chiropractors. However that attitude has changed through the years as intense and widespread opposition gradually has given way to more acceptance and greater cooperation with other, more traditional health care providers and a more positive general

public opinion with millions of satisfied patients. This review is intended to give an overview of why that has happened by describing the history and nature of chiropractic followed by a brief estimate of what the future can be expected to bring for the profession as a whole.

History

The concept of using spinal manipulation for therapeutic purposes has been around for a long time, going back at least 2500 years in numerous but apparently quite isolated sorts.¹ Chiropractic as the profession we know today began on September 18, 1895.³¹ D. D. Palmer was then practicing as a magnetic healer—a fairly common approach to health care at the time. The janitor in his building, Harvey Lillard, had become deaf after feeling something give way in his back while exerting himself in a cramped, stooping position. Palmer noted a vertebra out of its normal position and reasoned that if he could get it back in place, the man's hearing might be restored. Using the transverse process as a lever, Palmer applied what later became known as the first chiropractic adjustment, and Lillard regained his hearing. A short time later, Palmer had a similar experience with a patient with heart trouble.

Based on those two striking experiences, Palmer began a systematic investigation into that general approach to health care. It was Palmer's perception of the significance of those two events, coupled with his methodical and persistent followup, and by others who became aware of this developing train of thought, that led to the extended and more refined profession of chiropractic as it exists throughout the world today. There was no funding available, and solid clinical research methods were not yet formally developed. Nevertheless, Palmer opened the first school of such training in 1896. Little is known about what actually was included in those first years, although one early graduate stated that the schooling consisted primarily of observing Palmer's techniques and applying them to patients during a period of approximately 3 months.⁴⁷ The

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term “chiropractic” was derived from the Greek words *πρακτικός* (*prakticos*) and *χειρο* (*chiro*), meaning practice by hand.

A rather bumpy road followed with D. D. Palmer’s son, B. J. Palmer, being largely responsible for building the school into a significant and stable institution. In those early subsequent years, the chiropractic profession expanded and diversified with numerous other schools opening as early as 1897. The various schools often were based on differing opinions as to the best ways to apply the general concept of chiropractic, and sometimes apparently because of personality differences between prominent figures. It also seems that some were not legitimate institutions of learning with honorable intent, but were merely diploma mills trying to ride the wave of the emerging profession as an easy way to make money. By 1925, there was a peak of at least 82 schools in existence at the same time, although many were small and some apparently never graduated any students.¹⁵ By 1960, the number of schools had decreased to 22 and reached a low of 11 in 1969. With increased standards, accreditation, and licensure requirements aiding in the general maturation of the profession, the number of schools has been more stable during the last few decades. For some time, many people thought chiropractic was no better than placebo treatments at best, with some claiming chiropractors were quacks deliberately attempting to deceive the public for personal gain. Despite substantial opposition, there were always some loyal supporters of chiropractic treatment, claiming they had received major help where other treatments had failed. The profession slowly grew, primarily attributable to word of mouth from satisfied patients. Controversy continues today, but the discipline generally is better received and is more stable with 18 chiropractic colleges in the United States and another 15 throughout the rest of the world.

Efficacy and Patient Satisfaction

For most of the first century of chiropractic, there was little published data, but many studies have been done during the last 20 years as federal funding from the National Institutes of Health and from the Health Resources and Services Administration has begun to be awarded for chiropractic-related research projects. A summary paper by Meeker and Haldeman, published in 2002, indicates that there have been at least 73 randomized clinical trials of various types of spinal manipulation with 43 randomized trials of spinal manipulation specifically for treatment of some form of low back pain.²⁹ Thirty of those 43 studies showed that manipulation achieved better results than the comparison treatments in at least a subgroup of the treated patients, and the other 13 studies found no differences. Meeker and Haldeman also pointed out that “No

trial to date has found manipulation to be statistically or clinically less effective than the comparison treatment.”²⁹

Although by far most chiropractic treatment is given for back pain, it seems able to affect a broader range of conditions as shown in the following few examples. Second to back pain, chiropractors probably are best known for treatment of chronic headaches. Although not rigorously documented in large-scale, well-designed randomized control trials, as of 2001, there had been at least nine trials of various degrees of quality and size involving 683 patients with chronic headaches with reported clinical improvement.² In one study, subjects with chronic mechanical neck pain syndromes receiving spinal manipulation had an average increase in pressure pain threshold of 45% whereas a control group showed no change.⁴⁸ There is some indication that chiropractic treatment may be helpful for some cases of temporomandibular disorders based on positive case reports^{13,19,38} and the improvement of all nine patients in a small prospective case series.¹¹ The edge light pupil cycle time, a reflex of the eye that is mediated through the autonomic nervous system, is influenced by high-velocity manipulation to the upper cervical spine.¹⁸ Mechanical stimulation of the spine of rats has an effect on blood pressure, heart rate, and the activity of sympathetic nerves.³⁹ Some chiropractors report having successful treatment of otitis media such as in a case report by Saunders⁴⁰ that also includes reviews of a retrospective study of 46 children,¹⁶ a pilot study of 22 children,⁴¹ and two case series of five and 322 children.^{14,17}

Nevertheless, there are different views concerning the efficacy of chiropractic treatment, which is not surprising. Unfortunately, it is difficult to establish definitive, unarguable, and conclusive findings regarding much in the healing arts despite the millions of papers that have been written about presumably scientifically sound studies. Because of this difficulty, numerous medical procedures have not been rigorously proven to be effective either.^{24,44} Expert opinions vary on virtually every aspect of health care. For example, take the efficacy of using vitamin C. Even though a basic understanding of vitamin C has been known a long time, and despite many studies done concerning vitamin C, there is no unity of opinion among experts regarding such basic things such as how much, how often, or in what form it should be used or for which conditions. Similarly, there is no expectation that this paper, or any other, will resolve the conflicting opinions concerning the chiropractic approach to health care. What it will do, hopefully, is point out that there are good reasons for considering the value of chiropractic treatment.

Although not the same as clinical efficacy, patient satisfaction is an important consideration when evaluating the value of a method of treatment. Studies have shown that

many patients are satisfied with the chiropractic care they have received—more so than medical patients.^{30,42} One such study, for example, included surveys of patients with back pain: 93 had chiropractic treatment and 45 had medical treatment (primarily antiinflammatory drugs).³⁰ Approximately 90% of the patients who had chiropractic treatment claimed satisfaction with their care, whereas 52% of the patients who had medical care claimed satisfaction with theirs. In another example, 84% of 376 respondents to a survey of patients who had chiropractic care stated that they were very satisfied with their care, and 97% said they would recommend their chiropractor to a friend or relative.⁴²

Safety

Although some individuals try to make it seem that going to a chiropractor is risky business, the facts do not bear out such claims. The most common severe adverse event that has been associated with chiropractic treatment is a vertebrasilar stroke, which can be fatal. However, in the 65 years from 1934 to 1999, there were only 19 deaths anywhere in the world that were known to be associated with chiropractic treatment.⁴⁶

There are many more strokes associated with chiropractic treatment that do not result in death, although even these are rare. Based on reports to their insurance companies, there is one stroke of any degree associated with the care provided by 1000 chiropractors each year, or one stroke associated with approximately 1,000,000 chiropractic treatments.⁹ That means that, on average, 24 of 25 chiropractors will never see a patient have even a mild stroke during a career of 40 years. These numbers do not necessarily mean that the few strokes associated with chiropractic treatment actually were caused by the treatment—some could have just happened to occur in close proximity to a chiropractic treatment. With the millions of chiropractic treatments that have been given, it stands to reason that some patients would randomly have a stroke in close proximity to receiving chiropractic care.

In comparison to the 19 deaths that were at least associated with chiropractic treatment worldwide during a 65-year-period, there are approximately 225,000 iatrogenic deaths each year in the US, making it the third leading cause of death.⁴⁵ That large number includes all forms of medical treatment, many of which are for severe cases. However, even looking at low-dosage use of aspirin, perhaps the mildest, most common, and perceived by virtually everybody to be a safe medical treatment, there are still seven or eight deaths each year per million population (not just among those who use aspirin).²⁵ In comparison, the risk associated with chiropractic treatment can reasonably be considered slight.

Education and Licensure

The first chiropractic schools a century ago were often hastily put together with little oversight or in depth structure—the first appearing only one year after the first chiropractic adjustment was given in 1895. As the years passed by, chiropractic training diversified and yet stabilized within fairly specific points of view and approaches. Today, most of the 18 chiropractic colleges in the United States are accredited by a U.S. Department of Education certified agency, the Council of Chiropractic Education. Chiropractic institutions also have received professional and regional accreditation. They all require at least 4 academic years of schooling before their graduates are eligible to take licensure examinations. Successful completion of the examinations of the National Board of Chiropractic Examiners is either recognized or required by 46 states. Annual proof of continuing education credits also is required by most states for license renewal. In the United States, all but one of the chiropractic colleges are privately funded, but the colleges in Australia, South Africa, Denmark, one in Canada, and two in Great Britain are located in government-sponsored universities and colleges.²⁹

A 1998 study compared chiropractic and medical education based on site visits to three chiropractic and three medical institutions in North America.⁷ The chiropractic program consisted of approximately 4800 hours which was essentially the same as the medical program of 4667 hours, although medical students then are required to take 3 more years of graduate education to be eligible to practice. The additional medical training largely presents a breadth of clinical conditions that typically are not encountered in chiropractic education. Although similar in many categories, there are some differences, including more anatomy and physiology in the chiropractic curricula whereas medical curricula have more public health.

Independent Studies of Chiropractic

Most commentaries regarding chiropractic (pro and con) come from sources with a distinct bias, and therefore their interpretations of existing data tend to conform to their preexisting opinions. That would be the case with this article, and with the article published with this one by Homola. The most objective evaluations of chiropractic would be expected to come from independent sources if they have no vested interests, but rather simply have a need to know. There have been two such major studies done by the governments of two nations seeking to determine whether it would be in the best interests of their citizens to include chiropractic in their systems of socialized health care.^{6,28}

The first one was done in New Zealand more than 25 years ago.⁶ After a lengthy, exhaustive inquiry, a comprehensive 377-page report was compiled that listed many

findings including the following quotes that were taken from the Summary of Principle Findings:

Spinal manual therapy in the hands of a registered chiropractor is safe.

The education and training of a registered chiropractor are sufficient to enable him to determine whether there are contra-indications to spinal manual therapy in a particular case, and whether the patient should have medical care instead of or as well as chiropractic care.

Spinal manual therapy can be effective in relieving musculoskeletal symptoms such as back pain, and other symptoms known to respond to such therapy, such as migraine.

Chiropractors should, in the public interest, be accepted as partners in the general health care system. No other health professional is as well qualified by his general training to carry out a diagnosis for spinal mechanical dysfunction or to perform spinal manual therapy.

The other independent study was done by the government of Ontario for which a group of health economists was commissioned to study chiropractic management of low back pain (LBP).²⁸ The following quotes were taken from the Executive Summary of their findings:

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 LBP. Many medical therapies are of questionable validity or are clearly inadequate.

There is no clinical or case-control study that demonstrates or even implies that chiropractic spinal manipulation is unsafe in the treatment of low-back pain. Some medical treatments are equally safe, but others are unsafe and generate iatrogenic complications for LBP patients. Our reading of the literature suggests that chiropractic manipulation is safer than medical management of 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. We reviewed numerous studies that range from very persuasive to convincing in support of this conclusion. The lack of any convincing argument or evidence to the contrary must be noted and is significant to us in forming our conclusions and recommendations. The evidence includes studies showing lower chiropractic costs for the same diagnosis and episodic need for care.

There is good empirical evidence that patients are very satisfied with chiropractic management of LBP and considerably less satisfied with physician management. Patient satisfaction is an important health outcome indicator and adds further weight to the clinical and health economic results favoring chiropractic management of LBP.

Despite official medical disapproval and economic disincentive to patients (higher private out-of-pocket cost), the use of chiropractic has grown steadily over the years. Chiropractors are now accepted as a legitimate healing profession by the public and an increasing number of medical physicians.

Theory

Chiropractic is based on the theory that intervertebral joints can become stabilized in some aberrant situation that may lead to biomechanical and/or neurologic alterations. It originally was thought that it was a simple matter of a vertebra getting out of alignment relative to the adjacent vertebrae and consequently applying pressure on the spinal nerve root as it exited the spine through the intervertebral foramen. The subluxation, as this condition has been termed, was thought to sometimes cause the impediment of action potentials as they passed through that nerve. This "foot on the hose" concept provides an easily visualized explanation as to how subluxations could cause any of a myriad of symptoms in whatever region that nerve happened to supply.

As research began to be done, it became apparent that the mechanisms involved are not as straightforward as originally thought. Nevertheless, the general notion of some sort of deleterious lesion involving the spine and/or adjacent structures with far reaching implications that can be affected by spinal manipulation can be explained by other mechanisms. For example, it has been theorized that edema or inflammation of tissues in or around the intervertebral foramen sometimes could cause enough pressure on the spinal nerve roots to interfere with nerve impulses passing through them.²⁶ Some have hypothesized that rotational misalignment of the cervical vertebrae could twist the dura mater causing the dentate ligaments to pull directly on the spinal cord.²⁰ One other theory, of many, is that spinal kinematics can be impaired by localized joint fixations of various etiologies.³⁶ That is why some chiropractic approaches involve manual flexion of the spine—the clinicians are looking for specific areas of restricted motion.

Because the exact mechanisms are not known does not negate the validity and usefulness of the general concept of a subluxation. The term, which is ingrained in the profession, is somewhat of a misnomer because it no longer seems that there is always an abnormal displacement of one vertebra relative to the others. The entire practice of spinal manipulation is based on the concept that there must be some kind of lesion in the spine that responds favorably to manipulation. Therefore, other more accurately descriptive names have been suggested, such as manipulatable lesion. There is no reason to perform spinal manipulation if one is not convinced that there is some kind of lesion

present that would respond to manipulation. Although the specific mechanisms involved are not known, it has been empirically shown that there are specific indicators that typically are associated with a spinal lesion that is likely to respond to manipulation (a subluxation) such as joint restriction, muscle spasm, and/or pain.

Basic and Clinical Research

Although not well understood, there is a compendium of information concerning the nature of the subluxation that is coming from sources inside and outside the chiropractic profession. At least 34 animal studies have been done in that regard,²¹ with a few briefly mentioned in the following paragraph.

One study involving rats provided indications that an artificially induced subluxation leads to anatomic derangement of the spinal vertebrae.²⁷ A series of studies with rabbits included one that showed changes in gastric motility when misalignments were artificially induced in those spinal segments where nerves to the stomach exit from the spine.¹⁰ In a different rabbit study, narrowing of the neural foramen led to degeneration of the intervertebral disc which was accelerated by vibration, but no degeneration was induced by vibration alone.³² More recent studies involving artificially induced subluxations in rats have shown that a localized region of spinal stiffness leads to degeneration of facet surfaces, spur formation, and increased spinal stiffness even after the external fixation was removed.⁸ Responses of muscle spindles and Golgi tendon organs to spinal manipulation have been observed and described in cats.³³

Numerous *in vivo* and *in vitro* studies have been done concerning the immediate biomechanical and neurophysiologic aspects of spinal manipulation in the human body. Several studies have involved electromyographic (EMG) measurements documenting immediate (within a fraction of a second), apparently reflexive responses to spinal manipulation^{5,22} and the abrupt reduction of elevated levels of resting EMG activity in paraspinal muscles within a few minutes or seconds.^{12,23,43} The excised human lumbar spine has been shown to exhibit short column buckling under axial loading to assume an abnormal but stable configuration suggesting that there may be situations in which spinal manipulation could be helpful in restoring proper biomechanical functionality to the spine.^{34,49,50} Chiropractic manipulation has been found to improve gait symmetry in some cases.³⁷

Progress has been slow but steadily increasing as federal research funding has begun to be awarded for chiropractic-related studies during the last 20 years. The future of chiropractic research looks bright inasmuch as federal funding agencies, primarily the National Institutes of

Health (NIH), recognize the need for more chiropractic and other complementary and alternative medicine (CAM)-related research. The National Center for Complementary and Alternative Medicine (NCCAM) was formed in 1999 within the NIH specifically to address and fund CAM-related issues. The first federally funded building project dedicated to chiropractic research was completed 3 years ago, and the Palmer Center for Chiropractic Research was established with federal funding at the Palmer College of Chiropractic in Davenport, IA. The current program at Palmer for training chiropractic clinical researchers for the future is federally funded. Millions of federal dollars have been awarded to numerous chiropractic and other colleges and universities to fund various chiropractic-related research projects. This funding is expected to continue to increase as research capabilities increase at chiropractic colleges and interest in such research grows at other institutions.

Future Expectations

The future of clinical practice of chiropractic appears bright. There is increasing recognition and cooperation from medical and other clinicians as evidenced by the occurrence of joint practices⁴ and establishment of chiropractic colleges in public and other universities in other countries. Chiropractic services now are covered by most insurance companies, which provides an indication of the effectiveness, and specifically the cost effectiveness, of chiropractic treatment. The Veterans Administration and the Department of Defense also have begun to provide chiropractic treatment in their hospitals and clinics. According to the US Department of Labor, "Job prospects are expected to be good for persons who enter the practice of chiropractic. Employment of chiropractors is expected to grow faster than the average for all occupations through the year 2012 as consumer demand for alternative health-care grows."³ A look on the Web for best jobs found chiropractic listed as fourth in the 25 Top Jobs for 2005.³⁵

Chiropractic has struggled to overcome a less than optimal beginning, with some of its troubles likely being brought on or accentuated by the attitudes and manner of some of the early key players. Despite a bumpy start, the chiropractic profession is coming to its own. There always have been adamant supporters and adamant scoffers whose opinions often were shaped by a few isolated situations of which they were aware. However, as more documented information is developed and becomes available in the literature, personal opinions are giving way to established track records and research findings. Most chiropractic treatment is given for back pain, although there are indications that it may be helpful for other conditions as well. Inasmuch as studies consistently indicate that chiropractic

treatment, at least for back pain, is as effective and safe (if not more so) than medical treatment, that the cost of chiropractic care is not more (and often is considerably less) than medical care, and that patients receiving chiropractic care are on average more satisfied with their care than patients receiving medical care are with theirs, it is not surprising that positive public and professional opinion and use of chiropractic are increasing.

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