

Chiropractic and Its Use in Treating Low-Back Pain

2.5 Contact Hours

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Chiropractic and Its Use in Treating Low-Back Pain

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The contents of this course are taken from the National Center for Complimentary and Alternative Medicine, NIH. Learning objectives and post test have been prepared by Dr. Ratnakar P. Kini.

Objectives

Upon completion of this course, the learner will be able to:

1. Define chiropractic?
2. Discuss the discovery and uses of chiropractic.
3. Discuss the various diseases for which chiropractic is used.
4. Discuss and explain the various modalities of chiropractic treatment.
5. Enumerate and discuss the various side effects possible with chiropractic therapy.
6. Discuss the governmental regulations and health insurance plans for chiropractic therapy.
7. Discuss the scientific research findings in chiropractic therapy for low back pain.

Introduction

Chiropractic ("kye-roh-PRAC-tic") is a form of health care that focuses on the relationship between the body's structure, primarily of the spine, and function. Doctors of chiropractic, who are also called chiropractors or chiropractic physicians, use a type of hands-on therapy called manipulation (or adjustment) as their core clinical procedure. While there are some differences in beliefs and approaches within the chiropractic profession, this Research Report will give you a general overview of chiropractic, discuss scientific research findings on chiropractic treatment for low-back pain, and suggest other sources of information. Terms that are linked are defined in the "Definitions" section of this report.

Key Points

Chiropractic is most often used to treat musculoskeletal conditions--problems with the muscles, joints, bones, and connective tissue such as cartilage, ligaments, and tendons.

Research studies of chiropractic treatment for low-back pain have been of uneven quality and insufficient to allow firm conclusions. Nonetheless, the overall sense of the data is that for low-back pain, chiropractic treatment and conventional medical treatments are about equally helpful. It is harder to draw conclusions about the relative value of chiropractic for other clinical conditions.

The risk of experiencing complications from chiropractic adjustment of the low back appears to be very low. However, the risk appears to be higher for adjustment of the neck.

It is important to inform all of your health care providers about any treatment that you are using or considering, including chiropractic. This will help each provider make sure that all aspects of your health care are working together.

What is chiropractic?

The word "chiropractic" combines the Greek words *cheir* (hand) and *praxis* (action) and means "done by hand." Chiropractic is an alternative medical system and takes a different approach from conventional medicine (see box) in diagnosing, classifying, and treating medical problems.

What is conventional medicine?

Conventional medicine is medicine as practiced by holders of M.D. (Doctor of Medicine) or D.O. (Doctor of Osteopathic Medicine) degrees and by their allied health professionals, such as physical therapists, psychologists, and registered nurses. Other terms for conventional medicine include allopathy; Western, mainstream, orthodox, and regular medicine; and biomedicine.

What is complementary and alternative medicine (CAM)?

Health care practices and products that are not presently considered to be part of conventional medicine are called CAM. **Complementary** medicine is used **together with** conventional medicine. **Alternative** medicine is used **in place of** conventional medicine.

The basic concepts of chiropractic can be described as follows:

- The body has a powerful self-healing ability.

- The body's structure (primarily that of the spine) and its function are closely related, and this relationship affects health.
- Chiropractic therapy is given with the goals of normalizing this relationship between structure and function and assisting the body as it heals.

What is the history of the discovery and use of chiropractic?

Chiropractic is a form of spinal manipulation, which is one of the oldest healing practices. Spinal manipulation was described by Hippocrates in ancient Greece.¹⁻³ In 1895, Daniel David Palmer founded the modern profession of chiropractic in Davenport, Iowa. Palmer was a self-taught healer and a student of healing philosophies of the day. He observed that the body has a natural healing ability that he believed was controlled by the nervous system. He also believed that subluxations, or misalignments of the spine (a concept that had already existed in the bonesetter and osteopathic traditions), interrupt or interfere with this "nerve flow." Palmer suggested that if an organ does not receive its normal supply of impulses from the nerves, it can become diseased. This line of thinking led him to develop a procedure to "adjust" the vertebrae, the bones of the spinal column, with the goal of correcting subluxations.

Some chiropractors continue to view subluxation as central to chiropractic health care.² However, other chiropractors no longer view the subluxation theory as a unifying theme in health and illness or as a basis for their practice. Other theories as to how chiropractic might work have been developed.

Who uses chiropractic and for what health problems?

In 1997, it was estimated that Americans made nearly 192 million visits a year to chiropractors.⁴ Over 88 million of those visits were to treat back or neck pain.⁵ In one recent survey, more than 40 percent of patients receiving chiropractic care were being treated for back or low-back problems.⁶ More than half of those surveyed said that their symptoms were chronic. Conditions commonly treated by chiropractors include back pain, neck pain, headaches, sports injuries, and repetitive strains. Patients also seek treatment of pain associated with other conditions, such as arthritis.⁷

Low-back pain is a common medical problem, occurring in up to one-quarter of the population each year. Most people experience significant back pain at least once during their lifetime.⁸ Several recent reviews on low-back pain have noted that in most cases acute low-back pain gets better in several weeks, no matter what treatment is used.⁸⁻¹⁰ Often, the cause of back pain is unknown, and it varies greatly in terms of how people experience it and how professionals diagnose it.¹¹ This makes back pain challenging to study.

What kind of training do chiropractors receive?

Chiropractic training is a 4-year academic program consisting of both classroom and clinical instruction (see box). At least 3 years of preparatory college work are required for admission to chiropractic schools.^{12,13} Students who graduate receive the degree of Doctor of Chiropractic (D.C.) and are eligible to take state licensure board examinations in order to practice. Some schools also offer postgraduate courses, including 2- to 3-year residency programs in specialized fields.¹⁴

Chiropractic Training

Chiropractic training typically includes¹²:

Coursework in anatomy, physiology, microbiology, biochemistry, pathology, nutrition, public health, and many other subjects

The principles and practice of chiropractic

Research methods and procedures

Direct experience in caring for patients

The Council on Chiropractic Education, an agency certified by the U.S. Department of Education, is the accrediting body for chiropractic colleges in the United States.¹⁴

What do chiropractors do in treating patients?

If you become a chiropractic patient, during your initial visit the chiropractor will take your health history. He will perform a physical examination, with special emphasis on the spine, and possibly other examinations or tests such as x-rays.¹⁵ If he determines that you are an appropriate candidate for chiropractic therapy, he will develop a treatment plan.

When the chiropractor treats you, he may perform one or more adjustments. An adjustment (also called a manipulation treatment) is a manual therapy, or therapy delivered by the hands. Given mainly to the spine, chiropractic adjustments involve applying a controlled, sudden force to a joint. They are done to increase the range and quality of motion in the area being treated. Other health care professionals--including physical therapists, sports medicine doctors, orthopedists, physical medicine specialists, doctors of osteopathic medicine, doctors of naturopathic medicine, and massage therapists--perform various types of manipulation. In the United States, chiropractors perform over 90 percent of manipulative treatments.¹⁶

Most chiropractors use other treatments in addition to adjustment, such as mobilization, massage, and nonmanual treatments (see examples in the box).¹

Examples of Nonmanual Chiropractic Treatments¹

Heat and ice
Ultrasound
Electrical stimulation
Rehabilitative exercise
Magnetic therapy
Counseling about diet, weight loss, and other lifestyle factors
Dietary supplements
Homeopathy
Acupuncture

Have side effects or problems been reported from using chiropractic to treat back pain?

Patients may or may not experience side effects from chiropractic treatment. Effects may include temporary discomfort in parts of the body that were treated, headache, or tiredness. These effects tend to be minor and to resolve within 1 to 2 days.^{7,17}

The rate of serious complications from chiropractic has been debated. There have been no organized prospective studies on the number of serious complications. From what is now known, the risk appears to be very low.^{14,16,17} It appears to be higher for cervical-spine, or neck, manipulation (e.g., cases of stroke have been reported^{18,19}). The rare complication of concern from low-back adjustment is cauda equina syndrome, estimated to occur once per millions of treatments (the number of millions varies; one study placed it at 100 million¹⁶).^{1,20,a}

For your safety, it is important to inform all of your health care providers about any care or treatments that you are using or considering, including chiropractic. This is to help ensure a coordinated course of care (to find out more, see the NCCAM fact sheet "Selecting a Complementary and Alternative Medicine Practitioner").

^aMore information on the topic of complications can be found in references 1-3, 14, 21, and 22, and in scientific databases such as CAM on PubMed (see "For More Information").

Does the government regulate chiropractic?

Chiropractic practice is regulated individually by each state and the District of Columbia. Most states require chiropractors to earn continuing education credits to maintain their licenses.^{1,13} Chiropractors' scope of practice varies by state--including with regard to laboratory tests or diagnostic procedures, the dispensing or selling of dietary supplements, and the use of other

CAM therapies such as acupuncture or homeopathy.^{13,14,23} Chiropractors are not licensed in any state to perform major surgery or prescribe drugs.^b

^bIn Oregon, chiropractors can become certified to perform minor surgery (such as stitching cuts) and to deliver children by natural childbirth.^{14,23,24}

Do health insurance plans pay for chiropractic treatment?

Compared with CAM therapies as a whole (few of which are reimbursed), coverage of chiropractic by insurance plans is extensive. As of 2002, more than 50 percent of health maintenance organizations (HMOs), more than 75 percent of private health care plans, and all state workers' compensation systems covered chiropractic treatment.¹ Chiropractors can bill Medicare, and over two dozen states cover chiropractic treatment under Medicaid.²³

If you have health insurance, check whether chiropractic care is covered before you seek treatment. Your plan may require care to be approved in advance, limit the number of visits covered, and/or require that you use chiropractors within its network.

What has scientific research found out about whether chiropractic works for low-back pain?

For this report, the results of individual clinical trials and reviews of groups of clinical trials were examined. Sources were drawn from the National Library of Medicine's PubMed database; were published in English; and studied chiropractic techniques that were identified as such (e.g., "chiropractic manipulation") rather than some other forms of "manipulation" or "spinal manipulation therapy"--which, as noted above, may be delivered by certain other health care providers.^c

Clinical Trials

A clinical trial is a research study in which a treatment or therapy is tested in people to see whether it is safe and effective. Clinical trials are a key part of the process in finding out which treatments work, which do not, and why. Clinical trial results also contribute new knowledge about diseases and medical conditions. To find out more, see NCCAM's fact sheet "About Clinical Trials and Complementary and Alternative Medicine."

So far, the scientific research on chiropractic and low-back pain has focused on if, and how well, chiropractic care helps in relieving pain and other symptoms that people have with low-back pain. This research often compares chiropractic to other treatments.

Research studies

Appendix I gives detailed findings from seven controlled clinical trials and one prospective observational study of chiropractic treatment for low-back pain published between January 1994 and June 2003.

Summary of the research findings

The studies all found at least some benefit to the participants from chiropractic treatment. However, in six of the eight studies, chiropractic and conventional treatments were found to be similar in effectiveness.^{22,25-29} One trial found greater improvement in the chiropractic group than in groups receiving either sham manipulation or back school.³⁰ Another trial found treatment at a chiropractic clinic to be more effective than outpatient hospital treatment.³¹

General reviews, systematic reviews, and meta-analyses

Appendix II lists three reviews of clinical trials on chiropractic treatment for back pain, published between October 1996 and June 2003.

Summary of the research findings

Overall, the evidence was seen as weak and less than convincing for the effectiveness of chiropractic for back pain. Specifically, the 1996 systematic review reported that there were major quality problems in the studies analyzed; for example, statistics could not be effectively combined because of missing and poor-quality data. The review concludes that the data "did not provide convincing evidence for the effectiveness of chiropractic."³² The 2003 general review states that since the 1996 systematic review, emerging trial data "have not tended to be encouraging.... The effectiveness of chiropractic spinal manipulation for back pain is thus at best uncertain."³³ The 2003 meta-analysis found spinal manipulation to be more effective than sham therapy but no more or no less effective than other treatments.¹⁰

Several other points are helpful to keep in mind about the research findings. Many clinical trials of chiropractic analyze the effects of chiropractic manipulation alone, but chiropractic practice includes more than manipulation (see Question 5).³⁴ Results of a trial performed in one setting (such as a managed care organization or a chiropractic college) may not completely apply in other settings.^{29,35} And, researchers have observed that the placebo effect may be at work in chiropractic care,³⁴ as in other forms of health care.

^cThis fact sheet often uses the term "adjustment" to refer to chiropractic manipulation. In Question 9 and Appendices I and II, "manipulation" is used where it is used in the source(s) on chiropractic being discussed.

Are there scientific controversies associated with chiropractic?

Yes, there are scientific controversies about chiropractic, both inside and outside the profession. For example, within the profession, there have been disagreements about the use of physical therapy techniques, which techniques are most appropriate for certain conditions, and the concept of subluxations. Outside views have questioned the effectiveness of chiropractic

treatments, their scientific basis, and the potential risks in subsets of patients (for example, the risks of certain types of adjustments to patients with osteoporosis or risk factors for osteoporosis, compared to patients with healthier bone structures^{33,36}).

Research studies on chiropractic are ongoing. The results are expected to expand scientific understanding of chiropractic. A key area of research is the basic science of what happens in the body (including its cells and nerves) when specific chiropractic treatments are given.

For More Information

NCCAM Clearinghouse

Toll-free in the U.S.: 1-888-644-6226

International: 301-519-3153

TTY (for deaf and hard-of-hearing callers): 1-866-464-3615

E-mail: info@nccam.nih.gov

NCCAM Web site: nccam.nih.gov

Address: NCCAM Clearinghouse, P.O. Box 7923, Gaithersburg, MD 20898-7923

Fax: 1-866-464-3616

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The NCCAM Clearinghouse provides information on CAM and on NCCAM. Services include fact sheets, other publications, and searches of Federal databases of scientific and medical literature. The Clearinghouse does not provide medical advice, treatment recommendations, or referrals to practitioners.

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

Web site: www.niams.nih.gov

Toll-free in the U.S.: 1-877-22-NIAMS (or 301-495-4484)

NIAMS supports research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases; training of scientists; and information based on research. Publications are available.

Agency for Healthcare Research and Quality (AHRQ)

Web site: www.ahrq.gov

Telephone: 301-427-1364

AHRQ is the health services research arm of the Department of Health and Human Services. Publications that may be of interest include *Chiropractic in the United States: Training, Practice, and Research* (1998) and AHRQ's *Clinical Practice Guideline No.*

14: Acute Low-Back Problems in Adults (1994; however, this document has been archived by AHRQ and is not considered current clinical guidance).

CAM on PubMed

Web site: www.nlm.nih.gov/nccam/camonpubmed.html

CAM on PubMed, a database on the Internet developed jointly by NCCAM and the National Library of Medicine, offers citations to (and in most cases, brief summaries of) articles on CAM in scientifically based, peer-reviewed journals. CAM on PubMed also links to many publisher Web sites, which may offer the full text of articles.

ClinicalTrials.gov

Web site: www.clinicaltrials.gov

ClinicalTrials.gov is a database of information on clinical trials, primarily in the United States and Canada, for a wide range of diseases and conditions. It is sponsored by the National Institutes of Health and the U.S. Food and Drug Administration.

The Cochrane Library

Web site: www.cochrane.org/reviews/clibintro.htm

The Cochrane Library is a collection of science-based reviews from the Cochrane Collaboration, an international nonprofit organization that seeks to provide "up-to-date, accurate information about the effects of health care." Its authors analyze the results of rigorous clinical trials on a given topic and prepare systematic reviews. Abstracts (brief summaries) of these reviews can be read online without charge. You can search by treatment name or medical condition. Subscriptions to the full text are offered at a fee and are carried by some libraries.

Definitions

Acupuncture: A health care practice that originated in traditional Chinese medicine. Acupuncture involves inserting needles at specific points on the body, in the belief that this will help improve the flow of the body's energy (or qi, pronounced "chee") and thereby help the body achieve and maintain health.

Acute pain: Pain that has lasted a short time (e.g., less than 3 weeks) or is severe.

Alternative medical system: A medical system built upon a complete system of theory and practice; these systems have often evolved apart from and earlier than the conventional medical approach used in the United States. An example from a Western culture is naturopathic medicine; from a non-Western culture, traditional Chinese medicine.

Bonesetter: A health care practitioner (not necessarily a licensed physician) whose occupation is setting fractured or dislocated bones.

Cauda equina syndrome: A syndrome that occurs when the nerves of the cauda equina (a bundle of spinal nerves extending beyond the end of the spinal cord) are compressed and damaged. Symptoms include leg weakness; loss of bowel, bladder, and/or sexual functions; and changes in sensation around the rectum or genitalia.

Chronic pain: Pain that has lasted a long time (more than 3 months).

Clinical trial: A clinical trial is a research study in which a treatment or therapy is tested in people to see whether it is safe and effective. Clinical trials are a key part of the process in finding out which treatments work, which do not, and why. Clinical trial results also contribute new knowledge about diseases and medical conditions.

Complication: A secondary disease or condition that develops in the course of a primary disease or condition, or as the result of a treatment.

Controlled clinical trial: A clinical study that includes a comparison (control) group. The comparison group receives a placebo, another treatment, or no treatment at all.

General review: An analysis in which information from various studies is summarized and evaluated; conclusions are made based on this evidence.

Hippocrates: A Greek physician born in 460 B.C. who became known as the founder of Western medicine.

Homeopathy: Also known as homeopathic medicine. It is an alternative medical system that was invented in Germany. In homeopathic treatment, there is a belief that "like cures like," meaning that small, highly diluted quantities of medicinal substances are given to cure

symptoms, when the same substances given at higher or more concentrated doses would actually cause those symptoms.

Manipulation: Passive joint movement beyond the normal range of motion. The term adjustment is preferred in chiropractic.

Massage: A therapy in which muscle and connective tissue are manipulated to enhance function of those tissues and promote relaxation and well-being.

Meta-analysis: A type of research review that uses statistical techniques to analyze results from a collection of individual studies.

Mobilization: A technique, used by chiropractors and other health care professionals, in which a joint is passively moved within its normal range of motion.

Myofascial therapy: A type of physical therapy that uses stretches and massage.

Naturopathic medicine: Also known as naturopathy. It is an alternative medical system in which practitioners work with natural healing forces within the body, with a goal of helping the body heal from disease and attain better health. Practices may include dietary modifications, massage, exercise, acupuncture, minor surgery, and various other interventions.

Observational study: A type of study in which individuals are observed or certain outcomes are measured. No attempt is made to affect the outcome (for example, no treatment is given).

Orthopedist: Doctor of Medicine (M.D.) who is a surgeon specializing in disorders of the musculoskeletal system.

Osteopathic medicine: Also known as osteopathy. It is a form of conventional medicine that, in part, emphasizes diseases arising in the musculoskeletal system. There is an underlying belief that all of the body's systems work together, and disturbances in one system may affect function elsewhere in the body. Most osteopathic physicians practice osteopathic manipulation, a full-body system of hands-on techniques to alleviate pain, restore function, and promote health and well-being.

Osteoporosis: A reduction in the amount of bone mass, which can lead to breaking a bone after a minor injury, such as a fall.

Placebo: Resembles a treatment being studied in a clinical trial, except that the placebo is inactive. One example is a sugar pill. By giving one group of participants a placebo and the other group the active treatment, the researchers can compare how the two groups respond and get a truer picture of the active treatment's effects. In recent years, the definition of placebo has been expanded to include other things that could affect the results of health care, such as how a patient feels about receiving the care and what she expects to happen from it.

Prospective study: A type of research study in which participants are followed over time for the effect(s) of a health care treatment.

Randomized clinical trial: A study in which the participants are assigned by chance to separate groups that compare different treatments; neither the researchers nor the participants can choose which group. Using chance to assign people to groups means that the groups will be similar and that the treatments they receive can be compared objectively. At the time of the trial, it is not known which treatment is best. It is the patient's choice to be in a randomized trial.

Review: See general review, systematic review, or meta-analysis.

Sham: A treatment or device that is a type of placebo. An example would be positioning the patient's body and placing the chiropractor's hands in a way that mimics an actual treatment, but is not a treatment.

Subacute pain: Pain that has lasted somewhat longer than acute pain (for example, more than a few days or weeks) but is not yet chronic pain.

Systematic review: A type of research review in which data from a set of studies on a particular question or topic are collected, analyzed, and critically reviewed.

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Appendix I

Research Studies of Chiropractic Treatment in Adults with Back Pain

Published from January 1994 through June 2003

Citation	Description	Findings
Hurwitz et al., 2002 ²²	Randomized clinical trial (RCT) of patients in a managed care organization compared chiropractic care ^d (with and without any of the following added: heat or cold therapy, ultrasound, electrical muscle stimulation) with conventional medical care (with and without physical therapy added). Participants (652) had acute, subacute, or chronic low-back pain with or without leg pain. Back-pain intensity and back-related disability were measured.	After 6 months of followup, the conventional medical care and chiropractic regimens were found to be comparably effective.
Hsieh et al., 2002 ²⁵	RCT compared four treatments for subacute low-back pain (LBP): "joint manipulation" by a chiropractor, back school (program of counseling and exercises), myofascial therapy, and joint manipulation plus myofascial therapy. Participants (178) had LBP for either >3 weeks but <6 months in a current episode or >2 months within the preceding 8 months for recurrent LBP, and were evaluated 3 weeks and 6 months after treatment.	No statistically significant differences were found between groups at 3 weeks or 6 months.
Cherkin et al., 1998 ²⁶	RCT in an HMO setting of 321 adults aged 20-64 with low-back pain . Patients received either chiropractic manipulation, physical therapy (PT), or a booklet on self-managing back pain. They were monitored for 2 years and evaluated for	The outcomes for those who received manipulation or PT were better than those who received the booklet, but "only marginally better." There were no significant differences between the manipulation and PT groups. Authors note that

	bothersomeness of symptoms and level of dysfunction.	manipulation and PT "may slightly reduce symptoms."
Bronfort et al., 1996 ²⁷	For chronic low-back pain , prospective RCT compared (1) chiropractic spinal manipulation therapy (SMT) plus trunk-strengthening exercises with (2) chiropractic SMT plus trunk-stretching exercises and (3) trunk-strengthening exercises combined with an NSAID (drug). Enrollees (174) were measured for low-back pain, disability, and functional health status at 5 and 11 weeks.	Each of the 3 regimens yielded a "similar and clinically important improvement over time that was considered superior to the expected natural history of long-standing chronic low back pain."
Carey et al., 1995 ²⁸	Prospective observational study on the outcomes of care for acute low-back pain by chiropractors, primary care practitioners, and orthopedic surgeons, including how long it took to return to functional status. Participants (1,633) had acute pain of less than 10 weeks' duration.	Time to recovery was "essentially the same," regardless of which provider provided the care.
Meade et al., 1995 ³¹	RCT of 741 patients who came to chiropractic and hospital outpatient clinics in 11 centers, for low-back pain . Participants were randomized to receive either chiropractic or hospital-outpatient management. Outcomes were measured mainly with a pain disability questionnaire, at 6 weeks, 6 months, and 1, 2, and 3 years.	Chiropractic was found to be more effective, especially for those with "short current episodes, a history of back pain, and initially high [pain scale] scores." Benefit was less evident at 2 and 3 years than earlier. Authors noted that further trials are needed, e.g., on specific components of chiropractic.
Triano et al., 1995 ³⁰	RCT comparing chiropractic spinal manipulation, sham manipulation, and a back education program. Participants (170) had low-back pain (lasting 7 weeks or longer or consisting of at least 6 episodes in 12 months) and were evaluated for pain and activity tolerance at enrollment,	Greater improvement was found in the manipulation group than in other groups. Pain relief continued to end of evaluation period.

	after 2 weeks of treatment, and after 2 weeks of no treatment.	
Pope et al., 1994 ²⁹	Prospective RCT compared chiropractic spinal manipulation for treatment of subacute low-back pain to massage, use of a corset, and TMS (electrical muscle stimulation). Patients (164) were treated for 3 weeks and evaluated through various standardized instruments and examinations.	Various improvements were seen in all 4 groups. The manipulation group had the most improvement in flexion and pain. However, authors concluded overall that none of the changes in physical outcomes measured was significantly different between groups.

^dHurwitz et al. define chiropractic care as "spinal manipulation or another spinal-adjusting technique."

Appendix II

Reviews on Chiropractic Treatment for Back Pain in Adults

Published from October 1996 through June 2003

Citation	Description	Findings
Assendelft et al., 2003 ^{10,e}	Meta-analysis of 39 randomized clinical trials of treatments for acute or chronic low-back pain in adults. The trials compared spinal manipulation (by chiropractors and other health care providers) with another treatment or control condition (including no treatment, conventional medical care, pain-relieving drugs, physical therapy, exercise, and back school).	Spinal manipulation was more effective than sham therapy, but no more or no less effective than other treatments. Authors found that the specific profession of the manipulators (including chiropractors) did not affect these results.
Ernst, 2003 ³³	General review of the scientific evidence for the effectiveness of chiropractic spinal manipulation for back pain (this review is not limited to low-back pain studies).	Author noted there has been only one systematic review of chiropractic spinal manipulation exclusively (Assendelft et al., 1996, see below), and that, since that study, emerging trial data "have not tended to be encouraging.... The effectiveness of chiropractic spinal manipulation for back pain is thus at best uncertain."
Assendelft et al., 1996 ³²	Systematic review of 8 RCTs of chiropractic for acute or chronic low-back pain .	Authors stated that all studies analyzed had serious flaws in design, execution, and reporting. Studies could not be pooled to reach statistical conclusions because of insufficient data and data quality problems. Authors summarized the available data narratively; concluded they "did not provide convincing evidence for the effectiveness of chiropractic for acute or chronic low back pain"; and noted that

		better-executed trials are needed in future.
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°This study on spinal manipulation is included because the authors were able to break down the findings according to the profession of the manipulator, including chiropractors.