

The Path to Change in the US Healthcare System: Chiropractic Cost-Effectiveness Supplement



**Joint policy statement regarding the cost effectiveness of chiropractic care
presented by a united chiropractic profession**

**American Chiropractic Association
The Association of Chiropractic Colleges
Congress of Chiropractic State Associations
International Chiropractors Association**

COST EFFECTIVENESS SUPPLEMENT

The following is a collection of synopses and full studies related to the cost effectiveness and efficacy associated with chiropractic care and the procedures that doctors of chiropractic provide. The American Chiropractic Association, The International Chiropractic Association, The Congress of State Associations, and the Association of Chiropractic Colleges appreciates the opportunity to provide these materials for your review. For further information, please contact any of the organizations listed at the end of this report.

General Studies

An Examination Of Musculoskeletal Cognitive Competency In Chiropractic Interns Humphreys BK, Sulkowski A, McIntyre K, Kasiban M, Patrick AN. J Manipulative Physiol Ther. 2007 Jan;30(1):44-9

Prior studies have concluded that musculoskeletal medical education is inadequate; yet, musculoskeletal complaints are one of the most common reasons for seeking physician care. The researchers in this study compared the results of 154 fourth-year chiropractic interns that completed the Basic Competency Examination in musculoskeletal medicine. Most interns passed the test with results that were considerably better than those of recent medical graduates and physical therapy doctorate students. The chiropractic intern scores were also higher than those of orthopedic staff physicians. The 51%-64% success rate of chiropractors was almost double the 20%-30% rate of medical students and doctors.

Clinical Course in Patients Seeking Primary Care for Back Or Neck Pain: A Prospective 5-Year Follow-Up Of Outcome And Health Care Consumption. Enthoven P, Skargren E, Oberg B. Spine. 2004 Nov 1;29(21):2458-65

In this study the results of a questionnaire mailed to patients who had sought primary care for nonspecific back or neck pain were reviewed.. The researchers attempted to examine the long term clinical course of back and neck pain in the group of primary care patients. Researchers found that about 50% of the original patients continued to report pain and disability at both the one-year and five-year follow-up, however the outcome scores did not deteriorate overall. Researchers concluded that due to the frequency of recurring or continual pain in patients, health policies and clinical decision models for long-term outcome must allow for these factors.

Low Back Pain In A General Population. Natural Course And Influence Of Physical Exercise--A 5-Year Follow-Up Mortimer M, Pernold G, Wiktorin C. Spine. 2006 Dec 15;31(26):3045-51.

Researchers followed 790 patients who initially sought care for low back pain from 70 different caregivers. After 5 years, only 21% of patients studied reported no continued pain while only 37% reported no disability. Pain and disability scores dropped significantly at 6 months, then remained somewhat consistent at 2 yrs and 5 yrs. Nonspecific regular exercise did not affect recovery. Between 27% and 66% of the study population experienced a recurrence of low back pain.

Estimates And Patterns Of Direct Health Care Expenditures Among Individuals With Back Pain In The United States Luo X, Pietrobon R, Sun SX, Liu GG, Hey L. Spine. 2004 Jan 1;29(1):79-86

In this study researchers analyzed data from a 1998 Medical Expenditure survey. \$26 billion was attributed to back pain. Individuals with back pain spent 60% more on overall health care than those without back pain. This cost analysis study conflicts with the experts that claim back pain is a benign, self-limiting condition.

**Lost Productive Time And Cost Due To Common Pain Conditions In The US Workforce
Stewart WF, Ricci JA, Chee E, Morganstein D, Lipton. JAMA. 2003 Nov
12;290(18):2443-54**

The American productivity audit surveyed 29,000 working adults to quantify the impact of reduced performance at work due to pain. Researchers questioned respondents regarding the cost implications of reduced performance were due to headaches, arthritis, back pain and other musculoskeletal pain. Respondents were also asked if the common pain conditions had caused them to lose concentration, repeat jobs, do nothing or feel fatigued at work. The cost of lost productive time in the US workforce was found to be \$61 billion, and 76% of that cost was attributed to health-related reduced performance. This is consistent with prior studies that concluded loss of productive time is more significant than absenteeism. The data revealed that 1.1% of the workforce were absent one or more days per week because of common pain conditions.

Cost-Effectiveness Studies

Clinical and Cost Outcomes Of An Integrative Medicine IPA. Sarnat, Richard; Winterstein, James *Journal of Manipulative and Physiological Therapeutics* 2004; 27: 336-347.

In 1999, a large Chicago HMO began to utilize doctors of chiropractic (DCs) in a primary care provider role. The DCs focused on assessment and evaluation of risk factors and practiced with a non-pharmaceutical/non-surgical approach. Insurance claims and patient surveys were analyzed to compare clinical outcomes, costs and member satisfaction with a normative control group. During the 4-year study, this integrative medical approach, emphasizing a variety of complimentary and alternative medical (CAM) therapies, resulted in lower patient costs and improved clinical outcomes for patients. The patients who went to DCs as their primary care providers had 43 percent decreases in hospital admissions, 52 percent reductions in pharmaceutical costs and 43 percent fewer outpatient surgeries and procedures.

Comparative Analysis Of Individuals With And Without Chiropractic Coverage. Legorreta A, Metz D, Nelson C, Ray S, Chernicoff H, DiNubile N. *Archives of Internal Medicine* 2004; 164: 1985-1992.

A 4-year retrospective review of claims from 1.7 million health plan members were analyzed to determine the cost effects of the inclusion of a chiropractic benefit in an HMO insurance plan. The data revealed that members with a chiropractic benefit had lower overall total annual health care costs. Back pain patients with chiropractic coverage also realized lower utilization of plain radiographs, low back surgery, hospitalizations and MRI's. Back pain episode-related costs were also 25 percent lower for those with chiropractic coverage (\$289 vs. \$399).

Chiropractic Care: Is It Substitution Care Or Add-On Care In Corporate Medical Plans? Metz D, Nelson C, LaBrot T, Pelletier K. *Journal of Occupational and Environmental Medicine* 2004; 46: 847-855.

In this study, the claims of 8 million members insured by a managed health plan were evaluated to determine how patients utilize chiropractic treatment when they have a chiropractic benefit. They found that patients use chiropractic as a direct substitution for medical care, choosing chiropractic 34 percent of the time. Having a chiropractic benefit rider did not increase the number of patients seeking care for neuromusculoskeletal complaints.

United Kingdom Back Pain, Exercise and Manipulation Randomized Trial: Cost Effectiveness of Physical Treatments for Back Pain In Primary Care. *BMJ*. 2004 Dec 11;329(7479):1381. Epub 2004 Nov 19.

This study compared the benefits of spinal manipulation and exercise to "best care" in general practice for patients consulting for back pain. 1,287 patients were divided into treatment groups and followed for more than one year. Patients receiving manipulation

and exercise had lower relative treatment costs and experienced more treatment benefits than those treated with general medical care. The authors believe that this study convincingly demonstrated that manipulation alone and manipulation followed by exercise provided cost-effective additions to general practice.

Primary Care - Cost Effectiveness of Physiotherapy, Manual Therapy And General Practitioner Care For Neck Pain: Economic Evaluation Alongside A Randomized Controlled Trial. Korthals-de Bos I, Hoving J, Van Tulder M, Van Molken R, Ader H, De Vet H, Koes B, et al. *British Medical Journal* 2003; 326: 911.

Patients who received care from general practitioners for neck pain were randomly allocated to receive manual therapy (spinal mobilization), physiotherapy (mainly exercise) or general practitioner care (counseling, education and drugs). Throughout this 52-week study, patients rated their perceived recovery, intensity of pain and functional disability. Manual therapy proved to be the most effective treatment for neck pain. The clinical outcome measures showed that manual therapy resulted in faster recovery than physiotherapy and general practitioner care. While achieving this superior outcome, the total costs of the manual therapy-treated patients were about one third of the costs of physiotherapy or general practitioner care.

Integration and Reimbursement of Complementary and Alternative Medicine By Managed Care And Insurance Providers: 2000 Update And Cohort Analysis. Pelletier K, Astin J. *Alternative Therapies in Health and Medicine* 2002; 8(1): 38-48.

In this study the authors indicated that consumer demand for complementary and alternative medicine (CAM) is motivation for more managed care organizations (MCO's) and insurance companies to assess the clinical and cost benefits of incorporating CAM into their health plans. Providers identified "consumer demand" as the most critical factor underlying their decision to offer CAM coverage. Companies surveyed in the study tended to rate "retaining existing enrollees" as being more important than in previous years. It is equally certain that there is a rapidly growing consumer demand for CAM. Market demand is one of the primary motivators for offering coverage of CAM, with consumer interest similarly cited as a key factor.

Utilization, Cost, and Effects Of Chiropractic Care On Medicare Program Costs. Muse and Associates. *American Chiropractic Association* 2001.

This study examines cost, utilization and effects of chiropractic services on Medicare costs. The study compared program payments and service utilization for Medicare beneficiaries who visited DCs and those who visited other types of physicians. The results indicated that chiropractic care could reduce Medicare costs. Medicare beneficiaries who had chiropractic care had an average Medicare payment of \$4,426 for all Medicare services. Those who had other types of care had an average of \$8,103 Medicare payment for all Medicare services. The per claim average payment was also lower with chiropractic patients, having an average of \$133 per claim compared to \$210 per claim for individuals who did not have chiropractic care.

Economic Case for the Integration of Chiropractic Services into the Health Care System.

Pran, Manga. *Journal of Manipulative and Physiological Therapeutics* 2000; 23: 118-22.

In this study the author explores the effects of the integration of chiropractic care into the health care system. The author indicates that greater use of chiropractic care would lead to reduced costs and improved outcomes. As support, the author points to studies which demonstrate that chiropractic is effective for neuromusculoskeletal disorders and the evidence that patients often prefer chiropractic care over a medical approach.

Cost Comparison of Chiropractic and Medical Treatment Of Common Musculoskeletal Disorders: A Review Of The Literature After 1980. Branson, Richard. *Topics in Clinical Chiropractic* 1999; 6(2): 57-68.

A cost comparison study between DC-provided care and care provided by general and specialist MDs for individuals with musculoskeletal conditions found that the majority of retrospective studies had positive results for chiropractic care.

Enhanced Chiropractic Coverage Under OHIP (Ontario Health Insurance Plan) As A Means For Reducing Health Care Costs, Attaining Better Health Outcomes And Achieving Equitable Access To Health Services. Manga, Pran. *Report to the Ontario Ministry of Health*, 1998.

This study demonstrates the ways in which individuals in Ontario are deterred from the use of chiropractic care because it is not covered under OHIP. The authors indicate that greater chiropractic coverage under OHIP would result in a greater number of individuals visiting chiropractors and going more often. The study shows that despite increased visits to DCs, this would result in net savings in both direct and indirect costs. Direct savings for Ontario's healthcare system could be as much as \$770 million and at the very least \$380 million.

Costs And Recurrences Of Chiropractic And Medical Episodes Of Low Back Care. Smith, M; Stano, M. *Journal of Manipulative and Physiological Therapeutics* 1997; 20(1): 5-12.

This study compared the health insurance payments and patient utilization patterns of individuals suffering from recurring low back pain who visited doctors of chiropractic or medical doctors. Insurance payments were higher for medically initiated episodes. Those who visited chiropractors paid a lower cost and were also more satisfied with the care given. Because of this, the study suggests that chiropractic care should be given careful attention by employers when using gate-keeper strategies.

Chiropractic And Medical Costs Of Low Back Care. Stano M, Smith M. *Medical Care* 1996; 34(3): 191-204.

This study compares health insurance payments and patient utilization patterns for episodes of care for common lumbar and low back conditions treated by chiropractic and medical providers. Using 2 years of insurance claims data, this study examines 6,183 patients who had episodes with medical or chiropractic first-contact providers.

Researchers found that total insurance payments were substantially greater for episodes with a medical first-contact provider. The mean total payment when DCs were the first providers was \$518, whereas the mean payment for cases in which an MD was the first provider was \$1,020.

Stano, Miron. The Economic Role of Chiropractic Further Analysis of Relative Insurance Costs for Low Back Care. *Journal of the Neuromusculoskeletal System* 1995; 3(3): 139-144.

This retrospective study of 7077 patients compared costs of care for treatment of common low back conditions when a chiropractor was the first provider versus when a medical doctor (MD) was the first provider. Total payments for inpatient procedures were higher for MD initiated treatment and especially for episodes that lasted longer than a single day. Outpatient payments were much higher for MD initiated treatments as well. Payments were nearly twice as great for the medically initiated cases and their outpatient payments were nearly 50% higher. The authors' statistical estimates indicate that the costs of care for common low back disorders using a chiropractor as first-contact provider are substantially lower than episodes in which a medical physician is the first- contact provider. The author concluded that chiropractic care could help to control health care spending.

Henschke N, Maher CG, Refshauge KM, et al. Prognosis in Patients With Recent Onset Low Back Pain in Australian Primary Care: Inception cohort study. *BMJ* 2008;337:a171

This study sought to determine the one year prognosis of patients with low back pain. In this study, 973 patients with low back pain that had lasted less than 2 weeks completed a baseline questionnaire. Patients were reassessed through a phone interview at six weeks, three months and 12 months. The study found that the prognosis claimed in clinical guidelines was more favorable than the prognosis for the patients in the study. Recovery was slow for most patients and almost 1/3 of patients did not recover within one year.

Dagenais S, Caro J, Haldeman S. A Systematic Review of Low Back Pain Cost of Illness Studies in the United States and Internationally. *The Spine Journal* 2008;8:8-20

Researchers attempted to conduct a systematic review of low back pain cost of illness in the United States and internationally. The researched conducted a systematic review of the literature and found that many studies have attempted to determine the costs associated with the treatment of low back pain. While the studies examined use a variety of methodologies many indicate that the costs of care for this ailment is substantial. Researchers determined that additional studies which would provide an estimate of the cost of low back pain with its associated costs from a societal perspective would be helpful in determining how to allocate health care resources.

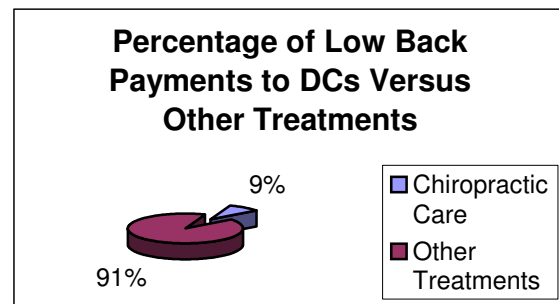
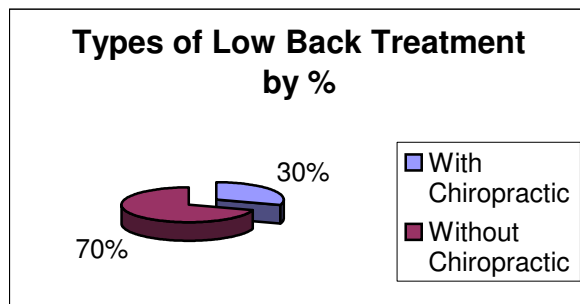
Workers Compensation Studies

Doctors of chiropractic treat injured workers through the Federal Workers' Compensation system and in all 50 states. In some states, mandates require that private plans cover chiropractic care for injured workers. The following information provides details on the role of doctors of chiropractic in the workers' compensation system.

Cost Comparisons of Chiropractic Care Versus other Health Care Provider

Texas Workers' Compensation Report¹

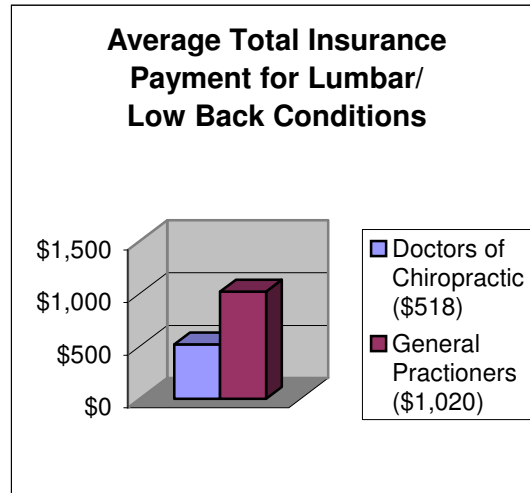
"The average cost of [low back injury] claims is \$15,884. When a worker with a lower back injury receives at least 75% of their care from a chiropractor that cost decreases to \$12,202 and when they receive at least 90% of their care from a chiropractor the average cost declines even further to \$7,632."



¹ MGT of America, Inc. *Chiropractic Treatment of Workers' Compensation Claimants in the State of Texas* (Austin, Texas: 2003)

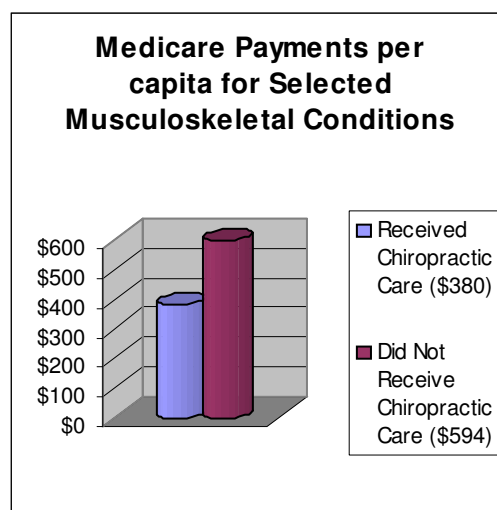
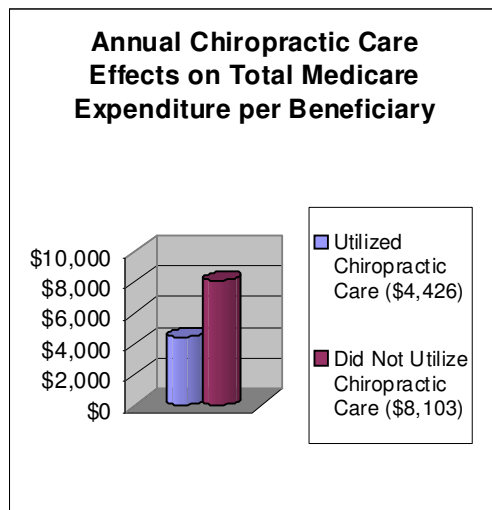
Manga II²

“The doubling of the proportion of the public that visits chiropractors in Ontario from 10% to 20%...will lead to a very substantial net savings in direct and indirect costs. Direct savings to Ontario’s health care system may be as much as \$770 million, will very likely be \$548 million, and will be at least \$380 million.”



Muse Report³

“...these results strongly suggest that chiropractic care significantly reduces per beneficiary costs to the Medicare program currently and could potentially save even more in the future.”

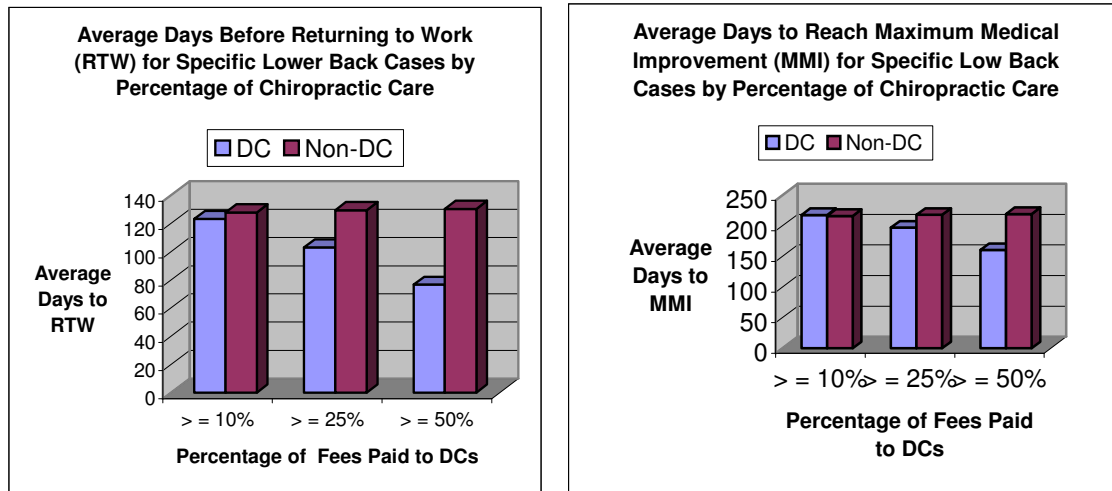


² Manga, Pran. “Enhanced chiropractic coverage under OHIP (Ontario Health Insurance Plan) as a means for reducing health care costs, attaining better health outcomes and achieving equitable access to health services.” *Report to the Ontario Ministry of Health*, 1998.

³ “Utilization, Cost, and Effects of Chiropractic Care on Medicare Program Costs” Muse and Associates. *American Chiropractic Association* 2001.

Florida Workers' Compensation Report⁴

“Based on estimated savings per claim, dramatic savings (possibly into the billions of dollars) may be possible with increased claimant access to chiropractic treatment for specific low back and other musculoskeletal conditions.”



State Specific Workers Compensation Studies

Chiropractic Treatment of Workers' Compensation Claimants in the State of Texas. Executive Summary. MGT of America Feb 2003.

This retrospective study of workers' compensation claims from 1996 to 2001 was conducted to determine the use and efficacy of chiropractic care in Texas. The researchers reviewed 900,000 claims during that time period to determine if chiropractic was cost-effective compared to medical treatment. They found that chiropractor treatment costs were the lowest of all providers. The study data demonstrated that increased utilization of chiropractic care could lead to declining costs relative to lower back injuries.

Chiropractic care of Florida workers' compensation claimants: Access, costs, and administrative outcome trends from 1994 to 1999. Folsom BL, Holloway RW. *Topics in Clinical Chiropractic* 2002; 9(4): 33-53.

This retrospective study of Florida workers' compensation claims from 1994-1999 found that the average total cost for low-back cases treated medically was \$16,998 while chiropractic care was only \$7,309. Patients treated primarily by chiropractors were found to reach maximum medical improvement almost 28 days sooner than if treated by a medical

⁴ MGT of America, Inc, *Trends in Chiropractic Treatment of Workers' Compensation in the State of Florida* (Tallahassee, Florida: 2002)

doctor. Findings from this analysis of the Florida claims indicate that considerable cost savings and more efficient claims resolution may be possible with greater involvement of chiropractic treatment in specific low back cases and other specific musculoskeletal cases.

Managed Care Pre-approval and its Effect on the Cost of Utah Worker Compensation Claims.

Jarvis KB, Phillips RB, Danielson C. *Journal of Manipulative and Physiological Therapeutics* 1997; 20(6): 372-376.

In this study, 5000 claims from 1986 and 5000 from 1989 pertaining to injured individuals in the Utah Worker Compensation Fund were examined. The study compared costs for those who received chiropractic care and those who received medical care. From 1986 to 1989 the cost of care for chiropractic increased 12% while medical care increased 71%. The replacement of wages increased 21% for those receiving chiropractic care and 114% for those receiving medical care.

Preliminary Findings of Analysis of Chiropractic Utilization in the Workers' Compensation System of New South Wales, Australia. Tuchin PJ, Bonello R. *Journal of Manipulative and Physiological Therapeutics* 1995; 18(8): 503-511.

In this study, researchers analyzed WorkCover Authority data from New South Wales. Of 1289 cases 30% had back problems. In 12% of the cases, chiropractic care was used for the treatment of spinal injury. The total payments for all cases using chiropractic and physiotherapy care were \$25.2 million, which was 2.4% of the total payments. When 20 claims were chosen at random the average chiropractic cost of care was \$299.65, while the average medical cost was \$647.20. A trend in data collected indicated that when greater than 60% of total cost of treatment came from chiropractic care the number of days missed from work was 9.5. When less than 60% of total cost of treatment came from chiropractic care the number of days missed from work was 50.3.

Additional Research Studies

Murphy DR, Hurwitz EL, Gregory AA, Clary R. A non-surgical approach to the management of lumbar spinal stenosis: a prospective observational cohort study. *BMC Musculoskelet Disord.* 2006 Feb 23;7:16.

Non-surgical treatment for spinal stenosis is often recommended but clinical outcome efficacy data has been little-studied. 57 patients with leg pain and lumbar spinal stenosis (LSS) documented by MRI or CT were treated at the Rhode Island Spine Center with distraction manipulation and neural mobilization. Neural mobilization is a nerve root mobilization technique applied by having the practitioner perform a series of maneuvers moving the foot alternatively into extension and flexion while flexing the hip and extending the knee. The distraction manipulation was theorized to break up periradicular adhesion, thereby releasing nerve root entrapment and restoring vascular function. The patients were also given cat and camel exercises to complement the manual techniques.

In general, patients were treated 2-3 times per week for 3 weeks then re-evaluated for outcome measurements and continued on a reduction of frequency basis for a mean number of 13 treatments. Improvement in disability and patient-rated changes were both significant and clinically meaningful. Long term follow-up at 16.5 months found patient-

rated improvement to be 76% while disability measured by Roland Morris Disability Questionnaire was 73%. The researchers concluded this treatment approach is a viable alternative to surgery and most patients should be treated non-surgically before considering an operation.

Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. *Spine J.* 2006 Mar-Apr;6(2):131-7

This study included 102 patients with acute back and/or leg pain of moderate to severe intensity and MRI evidence of disc protrusion. The patients received a maximum of 30 manipulations or simulated manipulations over a 30 day period. 28% of the manipulation group became pain-free locally vs. only 6% in the sham group. 55% of the manipulation group experienced absence of radicular symptoms compared to 20% of the no manipulation group. The manipulation group also had a significant decrease in use and prescriptions for NSAIDs.

Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. *J Manipulative Physiol Ther.* 2007 Mar-Apr;30(3):215-27.

Neck pain is a common ailment, with approximately 10-15% of the population suffering from it at any given time. The researchers in this study reviewed 1980 citations and found 13 high quality trials utilizing manipulation or manual therapy. Their review found that the benefit from manipulation was greater. The long-term data regarding spinal manipulation for chronic neck pain was not as conclusive. However, the results demonstrated a great benefit with treatment up to 104 weeks. The spinal mobilization trials also showed very good benefit at a 6 to 7 week outcome point, with 70% of patients having full recovery or important improvement at that point. The researchers attempted to determine whether the benefit could be the natural history and placebo effect and compared these trials with a separate group of controlled no-treatment patients. The researchers concluded that the benefit noted in this review exceeded the placebo effect and natural history of the no treatment group.

Murphy DR, Hurwitz EL, Gregory A, Clary R. A non-surgical approach to the management of patients with cervical radiculopathy. *J Manipulative Physiol Ther.* 2006 May;29(4):279-87

This study focused on 35 patients who were diagnosed with cervical radiculitis caused by either lateral stenosis or cervical disk herniation. The patients were treated with spinal manipulative therapy and were monitored for an average of 8 months. Improvement in disability was prospectively measured with a disability questionnaire and pain rating scale. The patients' cervical joints were palpated and SMT was applied to the level of dysfunction using both high-velocity and lower-velocity techniques. In some cases, anti-inflammatory modalities such as ice and anti-inflammatory drugs were used, although most of the patients were already taking these medications before the study began. Patients were typically treated 2 to 3 times per week with reduction of frequency thereafter.

Almost 90% of the patients described their improvement as excellent or good. The patients had marked improvement in both pain intensity (62%) and disability (75%) at the end of

the treatment. This improvement continued and increased at long-term follow-up. There were no major complications reported and there were no reports of short-term increases in pain. The researchers concluded the non-surgical approach to be safe and effective for the 35 patients in the study.

**Kathleen L. Beyerman, RN, EdD, Mark B. Palmerino, Efficacy Of Treating Low Back Pain And Dysfunction Secondary To Osteoarthritis: Chiropractic Care Compared With Moist Heat Alone
J Manipulative Physiol Ther 2006;29:107Q114)**

250 subjects with low back pain thought to be secondary to osteoarthritis were randomized to receive 20 treatments of either chiropractic care (flexion/distraction with spinal manipulation) with hot moist packs or hot moist packs alone. Chiropractic care with heat was found to be far superior to heat alone utilizing various outcome measures including pain intensity, ROM and activities of daily living. The chiropractic group had rapid improvement in personal care, walking, sitting and social life, while the moist heat alone group had no improvement of these factors.

Childs JD, Flynn TW, Fritz JM. A perspective for considering the risks and benefits of spinal manipulation in patients with low back pain. Man Ther. 2006 Nov;11(4):316-20.

In this study, the researchers divided 131 low back pain patients into groups receiving either manipulation and exercise or exercise alone. The researchers attempted to determine the effect of a public policy that does not routinely offer manipulation for patients with low back pain. There are large direct and indirect costs associated with prolonged low back pain disability and this study attempted to evaluate the risks associated with not treating low back pain patients with manipulation. The researchers attempted to determine the Number Needed to Treat (NNT) to prevent one patient from worsening in disability. They analyzed their treatment data and concluded that deciding not to treat a low back pain patient with manipulation is not innocuous or conservative. Patients treated with exercise only were 8 times more likely to experience worsening in disability at 1 week. Acute patients with symptoms not distal to the knee and fewer than 16 days were linked to a 66% probability that they would have a 50% reduction in disability over a 1-week period.

Gaumer G, PhD. Factors associated with patient satisfaction with chiropractic care: survey and review of the literature. J Manipulative Physiol Ther. 2006 Jul-Aug;29(6):455.

Chiropractic patient satisfaction has been reported to be very high in the scientific literature. A review of the literature found 8 studies that compared chiropractic care to care from medical doctors (MD). 6 studies showed higher satisfaction with chiropractic care while 1 found higher satisfaction with MD care and 1 was equivocal. The data for this study was collected by a national phone survey and involved contacting 400 adults who had received chiropractic services and 400 who never received chiropractic care.

The 22-minute phone interview found that 50% of all former chiropractic patients had seen a chiropractor in the past year. Family or friends had referred 66% of chiropractic patients while 12% were referred by their MD. Further analysis concluded that 12% of the adult US population had visited a chiropractor in the past 12 months. 83% of the chiropractic

patients reported they were satisfied or very satisfied while only 9% were dissatisfied with care received. The researchers concluded that the chiropractor's communication quality appeared to be a significant predictor of patient satisfaction. Patients responded that the doctors of chiropractic explained health problems and choices and seemed to be concerned about them as individuals in addition to their overall health.

Burke J, Buchberger DJ, Carey-Loghmani MT, Dougherty PE, Greco DS, Dishman JD. A pilot study comparing two manual therapy interventions for carpal tunnel syndrome. *J Manipulative Physiol Ther.* 2007 Jan;30(1):50-61.

A group of 22 carpal tunnel syndrome (CTS) patients were given a 10 session intervention of either Grastin Instrument –assisted soft tissue mobilization (GISTM) or soft tissue mobilization by hand. Both groups had substantial decrease from baseline pain at 3 months-post treatment and noticed immediate improvements in ability to perform tasks that were affected by CTS. Both wrist ROM and grip strength returned to normal.

The researchers concluded that this study supported the theory that manual therapy increases myofascial mobility which affects blood flow and thereby decreases nerve pressure. Nerve conduction latencies were not significantly improved. Clinical signs and symptoms such as Phalen's tests, Tinel's sign and 2-pt discrimination did not show adequate sensitivity or specificity to be useful as diagnostic criteria or outcome measures.

Engel RM, Vemulpad S. The effect of combining manual therapy with exercise on the respiratory function of normal individuals. *J Manipulative Physiol Ther.* 2007 Sep;30(7):509-13.

Non-communicable respiratory disease plays a significant role in worldwide mortality. Respiratory function measured with spirometry can estimate prevalence of chronic obstructive pulmonary disease. 50 asymptomatic individuals were randomized to receive exercise, manual therapy or both; then pre and post spirometry measurements were compared with the treatment effects with a control group. The manual therapy group was the only group to show a significant increase in respiratory function.

Fritz JM, Brennan GP, Leaman H. Does the evidence for spinal manipulation translate into better outcomes in routine clinical care for patients with occupational low back pain? *Spine J.* 2006 May-Jun;6(3):289-95.

Researchers examined the effect of thrust manipulation on patient diagnoses with occupational low back pain receiving worker's compensation. They stated that thrust manipulation is evidence-based, but is underutilized by physical therapists in the occupational setting. 578 patients were treated with either thrust manipulation, no-thrust manipulation or no manipulation. The thrust patients had a 66% reduction in Oswestry scores over a period of four sessions in 2.5 weeks. The thrust patients also had more improvement in both pain and disability compared to the no manipulation patients and the duration of care was shorter. The cost of physical therapy was also found to be greater in the non-thrust techniques group.

Haneline MT. Symptomatic outcomes and perceived satisfaction levels of chiropractic patients with a primary diagnosis involving acute neck pain. *J Manipulative Physiol Ther.* 2006 May;29(4):288-96

94 Chiropractic patients with acute neck pain were contacted after receiving treatment. 50% of them described experiencing acute neck pain after an automobile crash, while 40% reported no prior traumatic event. Approximately 84% of the patients indicated limited activity prior to chiropractic care and 57% of them described their restriction as severe. The mean number of chiropractic visits was 24 and included adjunctive treatment modalities in 94% of the cases. Pain levels improved dramatically from a mean of 7.5 to 1.9 (on a scale of 10) after treatment. These effects appeared to be long lasting. Overall, 94% of the patients were satisfied or very satisfied with care received. 84% of the patients had restricted activities before treatment, while only 25% of the treated patients noted restrictions at the time of the interview. Trauma patients received over 3 times as many visits as non-trauma patients. The researchers concluded the patients with acute neck pain had significant reduction in pain and activity restriction with chiropractic care.

Hawk C, Khorsan R, Lisi AJ, Ferrance RJ, Evans MW. Chiropractic care for non-musculoskeletal conditions: a systematic review with implications for whole systems research. *J Altern Complement Med.* 2007 Jun;13(5):491-512.

The objective of this systematic review of prior studies was to evaluate the evidence of chiropractic care on patients with non-musculoskeletal conditions. 179 papers addressing 50 different non-musculoskeletal conditions were reviewed. Unfortunately, the quality of many of the studies was not high. The researchers found research support for a total package of chiropractic care possibly benefiting patients with asthma, cervicogenic vertigo, and infantile colic. Evidence was promising for children with otitis media and elderly patients with pneumonia.

Boudreau LA, Busse JW, McBride G. Chiropractic services in the Canadian Armed Forces: a pilot project. *Mil Med.* 2006 Jun;171(6):572-6.

This article reviews results of surveys of 102 military personnel referred for chiropractic services in a Canadian Armed Forces Pilot Project. Traditionally, Canadian forces have had to self-pay for chiropractic services outside of the military system. The military personnel were all referred by the medical staff for chiropractic services. 52% of the patients complained of low back pain and their average initial onset was over 6 years. 94% of the patients responded that they were satisfied with the chiropractic care received while 80% of the referring physicians expressed satisfaction.

Gross DP, Ferrari R, Russell AS, Battié MC, Schopflocher D, Hu RW, Waddell G. A population-based survey of back pain beliefs in Canada. *Spine.* 2006 Aug 15;31(18):2142-5.

A telephone survey of 2400 Canadian adults found a lifetime prevalence of low back pain of 84% and a 1 week prevalence of 34%. 50% of those surveyed agreed with statements such as “back trouble makes everything worse,” “back trouble will eventually stop you from working,” and “later in life, back trouble gets progressively worse.” Subjects who had taken time off from work for their last pain episode were more likely to agree with the statement, “if you have back pain you should rest until it is better” and they were more likely to use resting or avoiding activity and staying in bed more than usual. The authors indicated that those surveyed responded contrary to recent evidence-based clinical practice guidelines that indicate that back pain is benign and self-limiting.

Bronfort G, Haas M, Evans R, Bouter L. Efficacy of Spinal Manipulation and Mobilization for Low Back Pain and Neck Pain: A Systematic Review and Best Evidence Synthesis. *Spine J.* 2004 May-Jun;4(3):335-56. Review

The authors categorized 43 randomized controlled trials to assess the efficacy of spinal manipulative therapy (SMT) for back and neck pain. Overall, there was limited to moderate evidence (depending on the study) that spinal manipulative treatment for both chronic and acute lower back pain was more effective and provided more short-term relief than many other types of care, including prescription drugs, physical therapy and home exercise. There was moderate evidence that spinal mobilization was superior to physical therapy and some medical regimens for some types of neck pain. The data synthesis in the study suggests that recommendations can be made with some confidence regarding the use of SMT and/or mobilization as a viable option for the treatment of both low back pain and neck pain.

Descarreaux M, Blouin J, Drolet M, Papadimitriou S, Teasdale N. Efficacy of Preventive Spinal Manipulation for Chronic Low Back Pain and Related Disabilities: A Preliminary Study. *Journal of Manipulative and Physiological Therapeutics* 2004; 27: 509-14.

Non-specific back pain patients were treated with twelve chiropractic spinal manipulations over a one-month intensive period. The patients were then divided into two groups, one group acting as a control and another receiving maintenance spinal manipulation every three weeks for nine months. Both groups improved with chiropractic care and maintained that improvement during the tenth month study. The group receiving maintenance treatment every three weeks reported better disability scores after nine months than the control group. This study appears to confirm previous reports showing that low back pain and disability scores are reduced after spinal manipulation. It also shows the positive effects of preventive chiropractic treatment in maintaining functional capacities and a reduction in the amount and intensity of pain episodes after an acute phase of treatment.

Fritz J, Whitman J, Flynn T, Wainner R, Childs J. Factors Related to the Inability of Individuals With Low Back Pain to Improve With a Spinal Manipulation. *Physiological Therapeutics* 2004; 84: 173-190.

The authors indicate that many interventions used by physical therapists for management of low back pain patients lacks evidence supporting their effectiveness. Although spinal manipulation is one of the few interventions for low back pain supported by evidence, it appears to be underutilized by physical therapists. The purpose of this study was to determine factors that may lead to an inability to benefit from manipulation. The majority of the subjects (72 percent) receiving spinal manipulation showed improvement, consistent with previous clinical trials that have shown favorable results. The physical therapists that wrote this paper support the advice of clinical practice guidelines that advocate at least a trial of manipulation for all patients with a new onset of low back pain. This work was supported by a research grant from the Foundation for Physical Therapy.

Hoiriis K, Pflieger B, McDuffie F, Cotsonis G, Elsangak O, Hinson R, Verzosa G.

A Randomized Clinical Trial Comparing Chiropractic Adjustments to Muscle Relaxants for Sub-Acute Low Back Pain. *Journal of Manipulative and Physiological Therapeutics* 2004; 27: 388-98.

Researchers compared the relative efficacy of chiropractic adjustments with muscle relaxants and placebo/sham for sub-acute low back pain (two- to six-weeks duration). They found chiropractic was more beneficial than placebo in reducing pain and more beneficial than either placebo or muscle relaxants in reducing the global impression of severity scale (GIS).

Aure O, Nilsen J, Vasseljen O. Manual Therapy and Exercise Therapy in Patients with Chronic Low Back Pain. *Spine* 2003; 28: 525-532.

Patients complaining of lower back or radicular pain were randomized to either manual therapy or exercise for a period of two months. Both groups of patients improved with treatment, however the manual therapy group showed significantly greater improvement on both short and long- (1 year) term follow-up. The researchers in this study also observed a considerable reduction in sick leave for the manual therapy group.

Niemisto L, Lahtinen-Suopanki T, et al. A Randomized Trial of Combined Manipulation, Stabilizing Exercises, and Physician Consultation Compared to Physician Consultations Alone for Chronic Low Back Pain. *Spine* 2003; 28: 2185-2191.

In this study, researchers randomly assigned 240 chronic low back pain patients to either manipulative treatment or a medical physician consultation. The manipulative group received four weeks of physician consultation, manipulation and exercise from an experienced manual therapist, while another group received only physician consultation and an educational booklet. Outcome was measured by pain intensity and back-specific disability. Both groups improved, however the patients treated with manipulation and exercise had more reduced pain and better self-rated disability than the consultation alone group.

Giles L, Muller R. Chronic Spinal Pain - A Randomized Clinical Trial Comparing Medication, Acupuncture and Spinal Manipulation. *Spine* 2003; 28: 1490-1503.

In this study, patients with chronic lower back pain of at least 13 weeks duration were randomly assigned either to medication, needle acupuncture or spinal manipulation. The results provided evidence that in patients with chronic spinal pain, manipulation results in greater short-term improvement than acupuncture or medication. The patients receiving spinal manipulation also reported a much higher full recovery rate (27%) than either those receiving acupuncture (9%) or medication (5%).

Wolsko P, Eisenberg D, Davis R, Kessler R, Phillips R. Patterns and Perceptions of Care for Treatment of Back and Neck Pain: Results of a National Survey. *Spine* 2003; 28(3): 292-298.

Researchers conducted a national telephone survey of 2,055 adults, asking if they had back or neck problems during the past 12 months, and if yes, what type of treatment was

received and how helpful was it. 33 percent of those surveyed reported having back or neck pain during the last year; 20 percent sought chiropractic care. Chiropractic providers were perceived as having been very helpful for back or neck pain in 61 percent of the cases, in contrast to only 27 percent who perceived their medical care as being very helpful. 72 percent of those treated by a chiropractor reported the treatment as very helpful, compared to only 19 percent of those who had seen conventional providers.

Hertzman-Miller R, Morgenstern H, Hurwitz E, et al. Comparing the Satisfaction of Low Back Pain Patients Randomized to Receive Medical or Chiropractic Care: Results From the UCLA Low Back Pain Study. *American Journal of Public Health* 2002; 92: 1628-1633.

Approximately one third as many back pain patients seek chiropractic care compared to those who seek medical care. In earlier randomized clinical trials, investigators found spinal manipulation to have similar or better rates of patient satisfaction when compared to medical approaches such as physical therapy, McKenzie method and standard medical therapy. This study examined the differences in satisfaction between patients assigned to either medical care or chiropractic care in a managed care organization. In this randomized trial, the chiropractic patients were more satisfied with their back care after 4 weeks of treatment. The researchers concluded that providers in managed care organizations may be able to increase the satisfaction of their low back pain patients by communicating advice and information to patients about their condition and treatment.

Hoving J, Koes B, De Vet H, Van Der Windt D, Assendelft W, Van Mameren H, Deville W, Pool J, Scholten R, Bouter L. Manual Therapy, Physical Therapy or Continued Care by a General Practitioner for Patients with Neck Pain. *Annals of Internal Medicine* 2002; 136: 713-7220.

In a randomized, controlled trial, researchers compared the effectiveness of manual therapy, physical therapy (PT) and continued care by a general practitioner (GP) in patients with nonspecific neck pain. The success rate at seven weeks was twice as high for the manual therapy group (68.3 percent) compared to the continued care group (general practitioner). Manual therapy scored better than physical therapy on all outcome measures. Additionally, patients receiving manual therapy had fewer absences from work than patients receiving physical therapy or continued care. The magnitude of the differences between manual therapy and the other treatments (PT or GP) was most pronounced for perceived recovery.

Hawk C, Long CR, Boulanger KT. Patient Satisfaction with the Chiropractic Clinical Encounter: Report from a Practice-Based Research Program. *Journal of the Neuromusculoskeletal System* 2001; 9(4): 109-117.

When 2,987 patients from a variety of rural and urban locations in the United States and Canada completed a data collection survey, 85 percent stated that their chiropractor always listened carefully. 85.3 percent stated, their chiropractor explained things understandably. 88.2 percent stated, that the chiropractor showed respect for what they had to say. Overall, the majority of patients were highly satisfied with their care.

Gemmell HA, Hayes BM. Patient Satisfaction with Chiropractic Physicians in an Independent Physicians Association. *Journal of Manipulative and Physiological Therapeutics* 2001; 24(9): 556-559.

In this study, 150 chiropractic patients were surveyed. Chiropractic care received excellent remarks by percentage, in the following categories: Time to Get an Appointment – 84.9 percent; Convenience of Office - 57.7 percent; Access to Office by Phone - 77.3 percent; Length of Wait - 75.7 percent; Time Spent with Provider - 74.3 percent; Explanation of Treatment - 72.8 percent; Skill of Provider - 83.3 percent; Personal Manner of the Chiropractor - 92.4 percent. The overall visit category was given the excellent response by 83.3 percent of those surveyed.

Nyiendo J, Haas M, Goodwin P. Patient characteristics, practice activities, and one-month outcomes for chronic, recurrent low-back pain treated by chiropractors and family medicine physicians: a practice-based feasibility study. *Journal of Manipulative and Physiological Therapeutics* 2000; 23: 239-45.

Patients with chronic (>6 weeks), recurrent lower back pain were treated by either a chiropractor or a family medicine clinic. After one month of treatment, chiropractic patients averaged higher improvement across all outcome measurements. The differences between provider groups were most marked for the question involving satisfaction with overall care (chiropractic-90%; medical-52%). Chiropractic patients also reported greater improvement in pain severity and functional disability. This study concluded that chiropractic patients expressed greater satisfaction regarding information and treatment provided.

Burton AK, Tillotson KM, Cleary J. Single-blind randomized controlled trial of chemonucleolysis and manipulation in the treatment of symptomatic lumbar disc herniation. *European Spine Journal* 2000; 9: 202-207.

Forty patients with confirmed sciatica were treated with either osteopathic manipulation treatment or chemonucleolysis. The pain endured by the patient was measured at 2 weeks, 6 weeks and one year. After a year patients from both groups were very similar in recovery. However, at 2 and 6 weeks those receiving manipulation reported greater improvement.

Giles L, Muller R. Chronic Spinal Pain Syndrome: A Clinical Pilot Trial Comparing Acupuncture, a Non-Steroidal Anti-Inflammatory Drug and Spinal Manipulation. *Journal of Manipulative and Physiological Therapeutics* 1999; 22: 376-81.

Patients referred to Townsville General Hospital outpatient Spinal Pain Unit in Australia for evaluation and treatment of chronic (>13 weeks) spinal pain were randomized to acupuncture, medication or spinal manipulation. After 30 days of treatment only the manipulation subgroup showed significant reduction in pain intensity. The manipulation group displayed uniform, significant, substantial improvements across all outcome measurements while in the two other intervention groups no significant improvement could be found.

Davis TP, Hulbert JR, Kassem KM, Meyer JJ. Comparative Efficacy of Conservative Medical and Chiropractic Treatments for Carpal Tunnel Syndrome: A Randomized Clinical Trial. *Journal of Manipulative and Physiological Therapeutics* 1998; 21(5): 317-326.

This study sought to compare the effects of chiropractic care and conventional medical care for managing carpal tunnel syndrome. 91 patients with confirmed symptoms of carpal tunnel syndrome were divided into two groups. One group received decreasing amounts of ibuprofen over three weeks. The other group received manipulation of bony joints and soft tissues of the upper extremities and spine. The patients' improvement was monitored through self-reports and analyses of the vibrometric sensibility of the hands. There was improvement in comfort, finger sensation and nerve conduction in both groups. For right hands affected by carpal tunnel the group who received medical care improved by 1.37 decibels according to the vibrometric tests. Those receiving chiropractic care improved by 3.05 decibels.

Nilsson N, Christensen HW, Harvigsen J. The Effect of Spinal Manipulation in the Treatment of Cervicogenic Headache. *Journal of Manipulative and Physiological Therapeutics* 1997; 20(5): 326-330.

Of 53 individuals who were diagnosed with cervicogenic headaches, 28 individuals in the group received high-speed, low-amplitude spinal manipulation in the cervical spine two times a week for three weeks. The rest of the group received low-level laser to the upper cervical region and deep-friction massage in the lower cervical/upper thoracic region two times a week for three weeks. For those who received spinal manipulation treatment, the amount of headache hours per day decreased 69 percent; for those receiving laser treatment, the decrease was only 37 percent. Intensity of headache decreased 36 percent for those receiving manipulations and 17 percent for those receiving laser treatment. The use of pain relievers went down 36 percent for those receiving manipulations and was unchanged for those receiving laser treatment.

Meade TW, Dyer S, et al. Randomized Comparison of Chiropractic and Hospital Outpatient Management for Low Back Pain: Results from Extended Follow Up. *British Medical Journal* Aug 1995, Vol. 311.

741 patients were randomly allocated to either chiropractic or hospital outpatient management. A 1990 study by these researchers reported greater improvement in patients with low back pain treated by chiropractors. This paper looks at data after a three-year follow-up. According to total Oswestry scores, improvement in chiropractic patients was 29 percent greater than those treated by hospitals. The beneficial effect of chiropractic on pain was particularly clear. Other scores (personal care, lifting, walking, standing, sex life, social life and traveling) also nearly all improved more in the patients treated with chiropractic care. The substantial benefit of chiropractic on intensity of pain is evident early on and then persists. A higher proportion of patients considered chiropractic care helpful in comparison with hospital treatments.

Boline PD, Kassem K, Bronfort G, Nelson C, Anderson A. Spinal Manipulation vs. Amitriptyline for the Treatment of Chronic Tension-Type Headaches: A Randomized Clinical Trial. *Journal of Manipulative and Physiological Therapeutics* 1995; 18(3): 148-154.

This study compared the effects of spinal manipulation and pharmaceutical treatments for chronic tension headaches. Four weeks following the cessation of treatment, the pharmaceutical group demonstrated no improvement from the baseline. In the spinal

manipulation group, headache intensity dropped 32 percent; frequency dropped 42 percent; and there was an overall improvement of 16 percent in functional health status.

Carey TS, Garrett J, Jackman A, McLaughlin C, Fryer J, Smucker DR. The outcomes and costs of care for acute low back pain among patients seen by primary care practitioners, chiropractors, and orthopedic surgeons. The North Carolina Back Pain Project. *New England Journal of Medicine* 1995; 333(14): 913-917.

This study sought to compare patients' recovery and satisfaction for those with acute low back pain receiving care from the following six groups: Urban Primary Care Physicians; Rural Primary Care Physicians; Urban Doctors of Chiropractic (DCs); Rural DCs; Orthopedic Surgeons; and Primary Care Providers at a Group Model HMO. After six months, functional recoveries, return to work and complete back pain recoveries were similar for all groups. Satisfaction with care was highest for those visiting DCs.

Manga, Pran; Angus, Doug; Papadopoulos, Costa; Swan, William. The Effectiveness and Cost-Effectiveness of Chiropractic Management of Low-Back Pain. Richmond Hill, Ontario: Kenilworth Publishing, 1993.

A major study to assess the most appropriate use of available health care resources was reported in 1993 by the Ontario Ministry of Health. The report overwhelmingly supported the efficacy, safety, scientific validity and cost-effectiveness of chiropractic for low back pain.

Sawyer CE, Kassak K. Patient Satisfaction With Chiropractic Care. *Journal of Manipulative and Physiological Therapeutics* 1993; 16(1): 25-32.

341 new and returning chiropractic patients in Minnesota and Wisconsin completed a patient satisfaction questionnaire. Overall, patients demonstrated a high level of satisfaction with their doctors of chiropractic. 84% of respondents felt their chiropractic care was just about perfect. 97% agreed or strongly agreed that they would recommend this doctor to a friend or relative.

Meade TW, Dyer S, Browne W, Townsend J, Frank AO. Low Back Pain of Mechanical Origin: Randomized Comparison of Chiropractic and Hospital Outpatient Treatment. *British Medical Journal* 1990; 300(2): 1431-1437.

741 patients, who had neither been treated in the past month nor had contraindications to spinal manipulation, were treated either by doctors of chiropractic or with conventional hospital outpatient treatment for management of low back pain. Using the Oswestry scale, which quantifies pain, patients reported back on their improvement at six weeks, six months, one year and two years. At two years, chiropractic care resulted in a 7 percent benefit over hospital care.

Cherkin, D., MacCornack, F. Chiropractic in the Mainstream: Patient Evaluations of Care from Family Physicians and Chiropractors. *Western Journal of Medicine* March 1989.

This survey demonstrated that patients of chiropractors were three times as likely as patients of family physicians to respond that they were satisfied with the care they received

for low back pain. Chiropractic patients were also more likely to have been satisfied with the amount of information they were given and to believe their doctors were concerned about them. This study was conducted at the Group Health Cooperative of Puget Sound, a 40-year-old staff-model Health Maintenance Organization (HMO) in western Washington State with 32,000 enrollees. The percentage of chiropractic patients who were very satisfied with the care they received for low back pain was triple that for patients of family physicians (66 percent versus 22 percent). Patients of family physicians were significantly less likely to report having received a graphic description of the causes of low back pain or instruction on exercise, posture and lifting techniques.

Butler RJ, Johnson WG. Satisfaction With Low Back Pain Care. *The Spine Journal* 2008;8:510-521

Researchers sought to determine the satisfaction patients had with providers based on provider type. The researchers were particularly interested in bedside manner and effectiveness of care and conducted interviews periodically with 1,831 workers who experienced worker related low back pain. Researchers found that individuals were more satisfied with their health care when treated by surgeons, chiropractors (DCs), or physical therapists.

Hurwitz EL, Carragee EJ, van der Velde G, et al. Treatment of Neck Pain: Noninvasive interventions. *Spine* 2008;33:S123-S152

Researchers reviewed literature from 1980 through 2006 on noninvasive interventions for neck pain and its associated disorders. The researchers found that for whiplash-associated disorders, there is evidence that educational videos, mobilization, and exercises appear more beneficial than usual care or physical modalities. Researchers also found that therapies involving manual therapy and exercise were effective for patients with neck pain.

Chou R, Huffman LH. Nonpharmacologic Therapies for Acute and Chronic Low Back Pain: A review of the evidence for an American Pain Society/American College of Physicians clinical practice guideline. *Ann Intern Med* 2007;147:492-504

Researchers sought to determine the benefits and harms of acupuncture, back schools, psychological therapies, exercise therapy, functional restoration, interdisciplinary therapy, massage, physical therapies (interferential therapy, low-level laser therapy, lumbar supports, shortwave diathermy, superficial heat, traction, transcutaneous electrical= nerve stimulation, and ultrasonography), spinal manipulation, and yoga for acute or chronic low back pain (with or without leg pain). Researchers conducted MEDLINE searches and the Cochrane Database of Systematic Reviews and graded the methodologies of the studies. Researchers concluded that there was good evidence that cognitive-behavioral therapy, exercise, spinal manipulation, and interdisciplinary rehabilitation were moderately effective for chronic or subacute low back pain.

Further Research Studies

1. *Chiropractic Management of Low Back Disorders: Report from a Consensus Process (Journal of Manipulative and Physiological Therapeutics)*
2. *Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society (Annals of Internal Medicine)*
3. *The Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its Associated Disorders (SPINE)*
4. *Chiropractic Management of Low Back Disorders (Council on Chiropractic Guidelines and Practice Parameters)*
5. *A Supermarket Approach to the Evidence-Informed Management of Chronic Low Back Pain (The Spine Journal)*
6. *Expenditures and Health Status Among Adults with Back and Neck Problems (Journal of the American Medical Association)*

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