CHIROPRACTIC SCIENTIFIC

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Indiana State Chiropractic Association 2014



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In the spectrum of provider-assisted care for LBP, chiropractic care is among the least invasive, least dangerous and least costly approaches to be considered.

Overview - Chiropractic^[1]

Introduction

Chiropractic (Greek: done by hand). A health care profession concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal system and the effects of these disorders on general health. There is an emphasis on manual techniques, including joint adjustment and/or manipulation, with a particular focus on joint subluxation and restoring function.

Chiropractic arose as a separate profession in the United States in the 1890s. Until the 1950s the profession was concentrated in North America and was largely isolated from the mainstream of health care. In the 1960s and 1970s the foundations were laid for broader acceptance of the profession – improved educational and licensing standards, significant research, research texts and scientific journals, and legal recognition and regulation in all US states and various other countries.

Today, more than 100 years after its birth, chiropractic is taught and practised throughout the world and the profession has earned broad acceptance from the public and in national health care systems for its services. It is widely regarded as the leading example of a complementary health care discipline reaching maturity and mainstream acceptance, and WHO has now published guidelines recommending minimal educational standards for the regulation of chiropractic services within national health care systems.

Practice

The relationship between structure, especially of the spine and musculoskeletal system and function, especially as coordinated by the nervous system, is central to the profession's approach to treatment, health and well being. Philosophically there is an emphasis on the mind/body relationship in health and the natural healing powers of the body. This represents a biopsychosocial philosophy of health rather than a biomedical one.



Research demonstrates that the primary reasons patients consult chiropractors are back pain (approximately 60%), other musculoskeletal pain such as pain in the neck, shoulder, extremities and arthritic pain (20%) and headaches including migraine (10%). About 1 in 10 (10%) present with a wide variety of conditions caused, aggravated or mimicked by neuromusculoskeletal disorders (e.g. pseudo angina, dysmennorhea, respiratory and digestive dysfunctions).

Management includes manual techniques with particular competency in joint adjustment/manipulation, and rehabilitation exercises, patient education and lifestyle modification, and the use of physical therapy modalities and orthotics and

other supports. The profession makes no use of prescription drugs or surgery, and patients requiring these interventions are referred for medical care.

Interdisciplinary practice is now increasing, with chiropractic doctors/medical doctors, physical therapists and others working as partners in private practices, occupational health, automobile accident and other rehabilitation centers and national sports medicine teams. While most chiropractic services in the USA are community based in private offices, hospital based services are today commonly available in many countries.

Law

The practice of chiropractic is recognized and regulated by law in approximately 40 countries, and in many other countries where the profession is established practice is recognized and legal under general law. Common features of legislation and practice in all jurisdictions are:

- Primary care direct contact with patients
- The right and duty to diagnose, including taking and/or ordering skeletal imaging
- No use of prescription drugs or surgery

The unqualified practice of chiropractic by persons without formal training, but claiming to be 'chiropractors', remains a significant problem in some countries without regulatory legislation (e.g. Brazil, Germany, Korea, Japan).

Education

Common international standards of education have been achieved through a network of accrediting agencies that began with the US Council on Chiropractic Education (CCE), recognized by the US Office of Education since 1974. These agencies are now represented by the Councils on Chiropractic Education International (CCEI).



Entrance requirements vary according to country, but in North America are a minimum of three years university credits in qualifying subjects (more often 4 years). The chiropractic college professional program has a minimum of 4 full-time academic years, and results in a Doctor of Chiropractic degree (D.C.), with the designation of Master's Degree or equivalent in many other countries. The professional diadactic program is followed by postgraduate clinical and/or specialty residency training and/or licensing exams both in the USA and in many other countries. Postgraduate specialties include chiropractic

sciences, orthopedics, pediatrics, neurology, radiology, rehabilitation and sports chiropractic.

In former times most chiropractors graduated from North American colleges. There are now colleges in Australia, Brazil, Canada, Denmark, France, Switzerland, Japan, Korea, Mexico, New Zealand, South Africa, Spain and the UK as well as the United States. Depending upon the country chiropractic education is either within the

university system (most countries) or in private colleges (USA). Several other countries have plans to open colleges in the near future (e.g. Argentina, China, Italy, Jordan, Norway and Thailand).

Research

There is substantial evidence supporting the safety and effectiveness of chiropractic treatment for patients with the conditions most frequently seen in chiropractic practice and highly prevalent in the population, namely:

Back Pain: Evidence-based practice guidelines from international and multidisciplinary expert panels endorse chiropractic management for both acute and chronic non-specific low-back pain by recommending spinal manipulation, over-thecounter pain medication, exercise and early return to activities as the most effective and cost-effective management for most patients. Rest beyond a few days, passive machine therapies, prescription drugs and steroid injections are not recommended on account of ineffectiveness and/or side effects. Management should be on a biopsychosocial model e.g. European Back Pain Guidelines www.backpainEurope.org.

Neck Pain: Evidence-based practice guidelines from similar expert panels (e.g. Quebec Task Force on Whiplash, 1995, Bone and Joint Decade Neck Pain Task Force 2008) support similar management for non-specific neck pain, the second largest cause of musculoskeletal disability after back pain in developed countries.

Headache: Chiropractic, medical and dental research during the 1990s identified the structures in the cervical spine that cause much headache previously diagnosed as tension headache or migraine, and now identified as cervicogenic headache by the International Headache Society. Clinical trials have now reported that chiropractic management is effective for patients with cervicogenic headache.

Integration

Chiropractic services are now becoming integrated with medical and other mainstream health care services in the USA and fully integrated in a number of other countries. At the University of Southern Denmark, chiropractic and medical students complete their first three years of study of basic sciences together before branching into their separate clinical training programs. In the US chiropractic education remains outside the university system but is now available in the military and veterans' administration hospital and health care systems, and through Harvard University's health care network as well as that of the University of Pittsburgh Medical Center health care network.

References:

[1] The Chiropractic Profession, NCMIC Group, 2000

Preface

Back pain costs the U.S. well in excess of \$100B annually. [1]

The prevalence of pain has a tremendous impact on business, with a recent report by the Institute of Medicine indicating that the annual value of lost productivity in 2010 dollars ranged between \$297.4 billion to 335.5 billion. The value of lost productivity is based on three estimates: days of work missed (ranging from \$11.6 to \$12.7 billion); hours of work lost (from \$95.2 to \$96.5 billion); and lower wages (from \$190.6 billion to \$226.3 billion). [2]

A summary of no less than 73 clinical trials involving spinal manipulation published in the Annals of Internal Medicine and other scientific journals attests to the effectiveness of spinal manipulation in managing back pain with none of the trials having produced negative results.

Additionally, official guidelines from the governments of at least 8 countries in North America, Western Europe and Australia propose that spinal manipulation is one of the two most-documented and effective management strategies for back pain [the other being the use of analgesics and nonsteroidal anti-inflammatory agents]. Spinal manipulation is considered the safest first-line treatment. With this type of documented effectiveness, least side effects, and avoidance of expensive alternatives when possible, the treatments which chiropractors apply continues to demand increasing consideration from mainstream medicine in a healthcare environment that is increasingly dependent upon the documentation of rigorous scientific evidence.

Services for the diagnosis and treatment of orthopedic musculoskeletal (MSK) complaints represent the largest category of medical expenditures in the United States. Recent claims data analysis, gathered for a 12-month period through the 3rd quarter of 2011, found that 17% of medical expenses were related to orthopedic services. [3]

The management of neck and low back pain easily outpaced expenditures for all other types of orthopedic disorders. Despite advancements in understanding evidence-informed management options, outcomes and expenses related to treatment of MSK conditions in the U.S. have not improved in recent years. [4]

Given the sizable demand for spine care in the marketplace, it is increasingly important to improve delivery at both the systems and individual levels. Although consistent clinical guidelines are well established, patterns of practice with respect to treatment of lower back pain (LBP) vary widely, and are notoriously resistant to change. An additional hurdle is that patients often use questionable information (often from non-medical sources) to follow a treatment path that is contrary to evidence-based clinical practice guidelines.

Available data indicates that more than 80% of spine care costs are associated with

non-surgical services. Given that reality, it is clear that a conservative approach to spine care is a priority to more effective management of expenditures and enhanced outcomes related to orthopedic treatment of musculoskeletal issues.

In the current environment, pain complaints are a leading reason for medical visits, and MSK issues rank as the top concern. Within this category, back pain is the most common ailment confronting individuals. [5]

Despite extensive research and efforts to reduce the personal, societal, and economic burdens of LBP issues, it remains one of the ten most costly medical conditions in the United States.

Non-specific LBP encompasses approximately 85% of all back pain diagnoses, affecting 80% of all adults at a cost estimated at \$100 billion annually. [6]

About 25% of individuals experiencing back pain will seek help from a health care provider.

Nearly three-quarters of these patients visit either a physician or chiropractor. Estimates suggest around 85-90% of primary care patients with LBP are diagnosed with non-specific back pain, wherethe underlying disease or pathology remains unknown.

The management of LBP can be complex. It is best viewed as a recurrent disorder that can occur anytime in a person's life. It can fluctuate between "no" or "mild" pain to "debilitating" pain. A substantial majority of those who suddenly develop LBP will see their condition improve quickly with or without professional care. Although symptoms usually subside in less than three months, recurrences and flare-ups often occur within one year. The prognosis can be grim for those experiencing persistent pain.

The early identification of individuals "at risk' of developing long-standing pain and disability has been advocated as a means to improving health and economic outcomes.

The management of LBP can also be costly. An OptumInsight TM analysis of internal data found the treatment of orthopedic conditions is the top cost category, representing 17% of overall medical expenses. [2] This surpasses the costs attributed to cardiology, gastroenterology, oncology, etc. of overall medical expenses. Spine care services account for the largest distribution of orthopedic expenditures (46%). More than 80% of spine care costs are associated with non-surgical treatments

From an episode-based perspective, chiropractors are the most cost-efficient health care providers for the initial management of low back pain. Cost efficiency favors a care pathway that begins with a patient consulting a chiropractor

Episode entry point appears to be associated with variable care pathways

and costs Using DC as a proxy for appropriate non-surgical pathway, there is a

potential \$219M risk adjusted impact for non-surgical spine care for 1.4M episodes in 4M members over 2.5 years

Guidelines for Diagnosis and Treatment

Evidence-based clinical practice guidelines for management of LBP were first introduced in 1994 with the aim of improving quality of care while reducing costs. Since then, more than 70 different sets of guidelines have been published internationally. Some consistency can be seen in guidelines outlined worldwide over the past decade that provides a consistent set of 'quality' recommendations for acute and chronic LBP.

They typically include the five sequential goals when assessing LBP:

- 1. Ruling out potential serious pathology (i.e., infection, tumor, fracture)
- 2. Ruling out specific causes of lower back pain (such as spinal stenosis)
- 3. Ruling out substantial neurological involvement
- 4. Evaluating the severity of symptoms and functional limitations
- 5. Identifying risk factors for chronicity.

It is notable that 85-90% of individuals assessed had nonspecific or ordinary LBP. Standard clinical practice guidelines for such cases recommend against routine imaging (radiography, computed tomography (CT) scan, magnetic resonance imaging (MRI), stronger opioid analgesics, and injection procedures (epidural, facet, and soft-tissue).

The consensus of the guidelines suggests that acute non-specific LBP patients should:

- be reassured of a good prognosis
- be educated in self-care
- remain active

• use, over-the-countermedications (acetaminophen, non-steroidal antiinflammatory drugs (NSAIDS) or spinal manipulation or both as a first line of symptom control.

Treatments such as traction, ultrasound, transcutaneous electrical nerve stimulator (TENS) unit and supports/braces are not recommended in these guidelines. However, supervised exercise, and to a lesser degree behavioral modification and/or acupuncture therapies are recommended for individuals having chronic or persistent LBP.

A major gap in many existing guidelines is they fail to identify the most appropriate healthcare provider at the outset of treatment. Instead, clinical guidelines are developed with a professional group e.g., primary care practitioners as the intended audience. As a result, clinical practice guidelines (CPG) are not well suited to inform decisions about who is the most appropriate initial health care provider. The concern with having patients first consult a general practitioner is treatment strategies may not be optimized for individual patients leading to inconsistent results.



This is important because not all patients entering a care pathway for spine-related

disorders are the same. Data suggest that for first contact settings, around 55% of patients are at low risk of poor outcome and are likely to do well irrespective of treatment while 33% are at medium risk and 12% are at high-risk of poor outcome. Patients at medium risk of poor outcome are defined as experiencing pain-related physical limitations. Patients at high risk of poor outcome are experiencing physical challenges and are emotionally distressed by their back pain and social circumstances.

Individuals at high risk may be acute patients struggling with their symptoms or those with long standing symptoms. Treatment pathways that include self-care strategies along with extra support from treatments delivered by chiropractors and/or physical therapists should be an important consideration when care is initiated for individuals at medium- and high-risk of an unfavorable outcome.

"If one looked only at the United States, it would be easy to conclude that the modern back pain crisis has proved impervious to the best efforts of researchers, health care providers, and policy makers" says S.W. Weisel. He points out that results in the U.S. lag behind other countries in both nonsurgical and surgical care for low spine-related pain. Weisel adds that the U.S. health care system "does not align with the scientific evidence. It does not seem to provide effective or cost-effective care on a consistent basis. And it appears to be producing patients with chronic disabling pain in record numbers [16]

Today's reality indicates that evidence-based guidelines are often not being followed – what is called a "know-do gap," the chasm between existing knowledge and actual practice.[17] Studies show that when guidelines are used, there is a positive impact on the clinical management of LBP, including better functional outcomes, reduced health care utilization and lower costs. [18] Yet adherence by primary care physicians to guideline care is estimated to be just 65%. [19]

According to recent studies:

• only about 50% of patients seeing a primary care physician receive a recommendation to remain active

• for acute nonspecific LBP, 65% of the cases receive recommendations for imaging studies, despite a clear guideline recommending against it

• manipulation, which is supported by most guidelines, is recommended by primary care physicians in only 2% of the acute nonspecific LBP cases.[20]

Treatments for LBP are proliferating, with more than 200 "conservative" treatment options offered by at least 31 different types of health care providers in the U.S. Patients receive an unpredictable mix of diagnoses, treatments, and ideas about back pain and its causation. [21]

A market that is so difficult for patients to navigate may explain why costs are rising without a corresponding improvement in outcomes. A nationally representative survey to measure trends in health care expenditures on adults who self-reported spine problems (neck and LBP) showed a substantial increase in expenditures from 1997 to 2005. Yet there was no evidence of corresponding

improvement in self-assessed health status, functional disability, work limitations, or social functioning.[22]

Among the trends in national expenditures for spine-related cases were: • a 49% increase in the number of patients seeking spine-related care (from 12.2 million in 1997 to 18.2 million in 2006). This represented the largest contributing factor to increased outpatient expenditures. [23] • an estimated 111% increase in totalnational spine-related expenditures for chiropractic visits from 1997 to 2006.

• a 78% increase in expenditures for spine-related physical therapy

• a 188% increase in expenditures for prescription medications, directly attributed to spine problems – a bigger jump than every other service category. This trend was primarily attributed to the estimated 423% increase in the expenditure for spine-related narcotic analgesics from 1997 to 2004. [23]

Recently published data concerning Medicare beneficiaries show parallel trends in the rate of increase for care of lower back pain, including dramatic increases in:

- imaging (MRI), up 307%
- spinal injections (facet up 231%, epidural up 271%)
- lumbar fusion surgery (up 220%) over 7-10 year intervals. [22]

A larger percentage of the expenditures are front-loaded, even among patients with non-specific LBP. Diagnostic and treatment interventions were found to be common in the first month. The utilization pattern of imaging and noninvasive services was just as prevalent for the group having non-specific LBP as the overall study population.

More than 32% of patients having LBP received x-rays, with at least 50% receiving them on the same day as the initial diagnosis. Second-line medication was prescribed for 69% of patients and opioids were prescribed for 42%. The median number of days to surgery was 90 for all those having surgery. Surgery was performed within 54 days (median) of the initial diagnosis for those individuals not classified as having chronic lower back pain (greater than 3 months duration).[24]

Data from OptumHealth indicate that a more efficient treatment path typically begins with a patient consulting a chiropractor. This path tends to lead to interventions that are more closely aligned with recommended treatment guidelines and ultimately more favorable solutions at more reasonable costs.

Similar findings can be found in a two-year retrospective claims analysis of Blue Cross Blue Shield-Tennessee members. It found that "Paid costs for episodes of care initiated with a doctor of chiropractic medicine (DC) were almost 40% less than episodes initiated with a medical doctor (MD). Even after risk adjusting each patient's costs, we found that episodes of care initiated with a DC were 20% less expensive than episodes initiated with an MD." [25]

What is needed? A better process to direct care

Health care organizations recognize the importance of encouraging consumers to select providers and/or plans that offer comparatively better quality-of-care. A recent study of consumers' beliefs, values, and knowledge showed that they often choose a treatment path that is contrary to what policy makers prescribe as evidence-based health care.

A dominant misconception among many consumers is that newer technologies result in higher-quality care. It is one reason why serious challenges exist in efforts to drive consumers toward evidence-based decision making. [26]

Proponents of evidence-based practices encourage consumers to be actively involved in decision making about health care. Yet when it comes to spine-related disorders, patient information about assessing health care provider selection and management options have, to this point been limited. Only when back surgery is required does there appear to be greater access to support tools. [9]

Insurers are beginning to take steps to empower consumers with better information and make it easier for the medical community to direct care in the most appropriate and cost-effective manner. Upgrading the diagnostic triage process is a crucial step in better managing costs and improving outcomes.

Conclusion

The incidence of neck and back pain issues for patients represents one of the most significant contributors to rising health care expenditures in the U.S. The lack of progress in improving outcomes and managing related costs is a significant concern for health insurers and providers, yet the status quo does not have to stand. Clinical practice guidelines already in place can help improve results in the treatment of nonspecific spine cases. An important step in the process is to put tools in the hands of patients to help guide them along the most effective treatment path.

References:

- [1] Katz JN. Lumbar disc disorders and low-back pain: socioeconomic factors and consequences [review]. J Bone Joint Surg Am. 2006;88(suppl 2): 21-24.
- [2] AL Rosner, Ph.D., Foundation for Chiropractic Education and Research; National Institute of Medicine Hearings; February 27, 2003
- [3] Optum. Conservative Care: Ensuring the Right Provider for the Right Treatment, 2012.
- [4] Carey TS, Freburger JK, Holmes GM, et al. A long way to go: practice patterns and evidence in chronic low back pain care. Spine 2009;34:718-724 Martin BI, et al. Expenditures and health status among adults with back and neck problems. Journal of the American Medical Association 2008; 299:656-664; Williams CM, Maher CG, Hancock MJ, et al. Low back pain and best practice care: a survey of general practice physicians.Archives of Internal Medicine 2010;170:271–277
- [5] Raofi S, Schappert SM. Medication therapy in ambulatory medical care: United States, 2003 04. Vital Health Statistics 2006; 13:1-40
- [6] Soni, A. Top 10 most costly conditions among men and women, 2008: estimates for the U.S. civilian noninstitutionalized adult population, age 18 and older. Statistical Brief #331. July 2011. Agency for Healthcare Research and Quality, Rockville, MD http://www.meps.ahrq.gov/mepsweb/data_files/publications/st331/stat331.pdf
- [7] Luo X, Pietrobon R, Sun SX, et al. Estimates and patterns of direct health care expenditures among individuals with back pain in the United States. Spine 2004; 29:79–86
- [8] van Tulder M, Becker A, Bekkering T, et al. European guidelines for the management of acute nonspecific

low back pain in primary care. The Research Directorate General of the European Commission. 2004 www.backpaineurope.com

- [9] Brownlee S, Wennberg JE, Barry MJ, et al. Improving patient decision-making in health care: a 2011 Dartmouth Atlas report highlighting Minnesota. The Dartmouth Institute for Health Policy and Clinical Practice 2011 (Feb. 24); www.dartmouthatlas.org
- [10] Waddell G. The back pain revolution. 2nd ed. Edinburgh, United Kingdom: Churchill Livingstone; 2004
- [11] Hayden JA, Dunn KM, van der Windt DA, Shaw WS. What is the prognosis of low back pain? Best Practice & Research Clinical Rheumatology 2010; 24:167–179
- [12] Koes BW, van Tulder MW, Thomas S. Diagnosis and treatment of low back pain. British Medical Journal 2006; 332:1430–4
- [13] Dagenais S, Haldeman S. Evidence-based management of low back pain. Mosby (Elsevier) 2012; ISBN:978-0-323-07293-9
- [14] Chou R, Qaseem A, Snow V, et al. 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 2007; 147:478-491
- [15] Hill JC, Whitehurst DGT, Lewis M, et al. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomized controlled trial. The Lancet 2011; Published online September 29, 2011 DOI:10.1016/S0140-6736(11)60937-9
- [16] Weisel SW (ed.). Has there been any progress in the management of low back pain? The BackLetter 2011; 26:109-116
- [17] Pablos-Mendez A, Shademani R. Knowledge translation in global health. Journal of Continuing Education in the Health Professions 2006;26:81-6.
- [18] Feuerstein M , Hartzell M , Rogers HL , et al. Evidence-based practice for acute low back pain in primary care:patient outcomes and cost of care. Pain 2006; 124:140–149.
- [19] Fritz JM, Cleland JA, Childs JD. Subgrouping patients with low back pain: evolution of a classification approach to physical therapy. Journal of Orthopaedic & Sports Physical Therapy 2007a; 37:290-302
- [20] Finestone AS, Raveh A, Mirovsky Y, et al. Orthopaedists' and family practitioners' knowledge of simple low back pain management. Spine 2009; 34:1600–1603
- [21] Weiner SS, Weiser SR, Carragee EJ, Nordin M. Managing nonspecific low back pain: Do nonclinical patient characteristics matter? Spine 2011; 36:1987-1994
- [22] Haldeman S, Dagenais S. A supermarket approach to the evidence-informed management of chronic low back pain. The Spine Journal 2008;8:1-7
- [23] Deyo RA, Mirza SK, Turner JA, Martin BI. Overtreating chronic back pain: time to back off? Journal of the American Board of Family Medicine 2009; 22:62-68
- [24] Martin BI, Turner JA, Mirza SK, et al. Trends in health care expenditures, utilization, and health status among US adults with spine problems, 1997–2006. Spine 2009; 34:2077–2084
- [25] Ivanova JI, Birnbaum HG, Shiller M, et al. Real-world practice patterns, health-care utilization, and costs in patients with low back pain: the long road to guideline-concordant care. Spine Journal 2011; 11:622-632
- [26] Liliedahl RL, Finch MD, Cost of care for common back pain conditions initiated with chiropractic doctor vs. medical doctor/doctor of osteopathy as first physician experience of one Tennessee-based general health insurer. Journal of Manipulative and Physiological Therapeutics 2010; 33:1-4

[27] Carman KL, Maurer M, Yegian M, et al. Evidence that consumers are skeptical about evidencebased health care. Health Affairs 2010; 29 (7): doi: 10.1377/hlthaff.2009.0296

Historical Perspective (1989 - 1993)

It was estimated that in 1992 low back pain costs in the US amounted to staggering \$60 billion when production lost was taken into consideration. Research has indicated that low back pain disability is growing 14 times faster than the population rate. It's the leading cause of disability and morbidity in middle-aged persons, and is the most expensive source of workers' compensation costs in North America. In the 30-50 age groups, low back pain is the single most expensive health care problem.

The escalating costs associated with low back pain have prompted legislators, policy makers and insurance companies to investigate cost-containment strategies. As will be seen in the following studies, chiropractic care has been consistently identified as one of the most effective and cost effective treatments for the management of many low back conditions, especially those diagnosed as non-specific, and/or uncomplicated, in addition to a number of other neuromusculoskeletal disorders. Moreover, the volume of scientific evidence now being compiled makes a compelling case for the use of chiropractic as a means of controlling the escalating costs of our overburdened health care system.

Prevalence of Selected Impairments. United States - 1971. National Center for Health Statistics, Hyattsville, Maryland - 1975, DHHS Publication No. (PHS)75-1526 (Series 10, No. 9) and 1981 DHHS Publication No. (PHS) 87-1587 (Series 10, No. 159)

Back Injuries in Industry: A Retrospective Study Part I Overview and Cost Analysis. Spengler et al. Spine, 1986 - 11(3):241-245.

From the British Medical Journal

Scientific heavyweights deplore the NHS money wasted on "unproved and disproved" treatments used by practitioners of complementary and alternative medicine (CAM), [1][2] but Lewith, a CAM proponent, is cited elsewhere as saying that the BMJ reckons that 50% of the treatments used in general practice aren't proved, and 5% are pretty harmful but still being used. [3]



His data were taken from the BMJ Clinical Evidence website. A pie chart (see it below in the Evidence-based Practice posting) indicates that, of about 2500 treatments supported by good evidence, only 15% of treatments were rated as beneficial, 22% as likely to be beneficial, 7% part beneficial and part harmful, 5% unlikely to be beneficial, 4% likely to be ineffective or harmful, and in the remaining 47% the effect of the treatment was "unknown."

The text says, "The figures suggest that the research community has a large task ahead and that most decisions about treatments still rest on the individual judgements of clinicians and patients." On 9 October 2007 the situation had changed—but not for the better. Treatments rated "beneficial" had decreased from 15% to 13%.

References:

- 1. Kamerow D. Wham, bang, thank you CAM. British Medical Journal 2007 (Sep 29); 335:647
- 2. Colquhoun D. What to do about CAM? British Medical Journal 2007 (Oct 13); 335: 736
- 3. Cope J. The great debate. Healthwriter 2007 (Apr):1-3.

A) Cost Effectiveness (Post 2000)

2013 - Early predictors of lumbar spine surgery after occupational back injury: results from a prospective study of workers in Washington State.

Spine(Phila Pa 1976). 2013 May 15;38(11):953-64. Keeney BJ, Fulton-Kehoe D, Turner JA, Wickizer TM, Chan KC, Franklin GM.

Source

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Abstract

STUDY DESIGN: Prospective population-based cohort study.

OBJECTIVE: To identify early predictors of lumbar spine surgery within 3 years after occupational back injury.

SUMMARY OF BACKGROUND DATA: Back injuries are the most prevalent occupational injury in the United States. Few prospective studies have examined early predictors of spine surgery after work-related back injury.

METHODS: Using Disability Risk Identification Study Cohort (D-RISC) data, we examined the early predictors of lumbar spine surgery within 3 years among Washington State workers, with new workers compensation temporary total disability claims for back injuries. Baseline measures included worker-reported measures obtained approximately 3 weeks after claim submission. We used medical bill data to determine whether participants underwent surgery, covered by the claim, within 3 years. Baseline predictors (P < 0.10) of surgery in bivariate analyses were included in a multivariate logistic regression model predicting lumbar spine surgery. The area under the receiver operating characteristic curve of the model was used to determine the model's ability to identify correctly workers who underwent surgery.

RESULTS: In the D-RISC sample of 1885 workers, 174 (9.2%) had a lumbar spine surgery within 3 years. Baseline variables associated with surgery (P < 0.05) in the multivariate model included higher Roland-Morris Disability Questionnaire scores, greater injury severity, and surgeon as first provider seen for the injury. Reduced odds of surgery were observed for those younger than 35 years, females, Hispanics, and those whose first provider was a chiropractor. Approximately 42.7% of workers who first saw a surgeon had surgery, in contrast to only 1.5% of those who saw a chiropractor. The area under the receiver operating characteristic curve of the multivariate model was 0.93 (95% confidence interval, 0.92-0.95), indicating excellent ability to discriminate between workers who would versus would not have surgery.

CONCLUSION: Baseline variables in multiple domains predicted lumbar spine surgery. There was a very strong association between surgery and first provider seen for the injury even after adjustment for other important variables.

COMMENT: The results of this new study further documents chiropractic care as a first option for back pain relief and surgical avoidance. The study concluded there were reduced odds of surgery for those under age 35, women, Hispanics and those whose first provider was a chiropractor. In total, 42.7 percent of workers who initially visited a surgeon underwent surgery, in contrast to only 1.5 percent of those who first consulted a chiropractor. This important study was conducted by a collaboration of prestigious institutions, including Geisel School of Medicine at Dartmouth College, University of Washington School of Public Health, University of Washington School of Medicine, Ohio State University College of Public Health and the Washington State Department of Labor and Industries. Back injuries are the most prevalent occupational injury in the U.S., and care is commonly associated with one of the most costly treatments – spine surgery. Chiropractic is clearly the most appropriate first treatment option for patients with back pain, and this study confirms the value.

2013 - Dose-response and Efficacy of Spinal Manipulation for Care of Chronic Low Back Pain: A Randomized Controlled Trial

Spine J. 2013 Oct 16. [Epub ahead of print] Mitchell Haas, DC, et al

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BACKGROUND CONTEXT: There have been no full-scale trials of the optimal number of visits for the care of any condition with spinal manipulation.

PURPOSE: To identify the dose-response relationship between visits to a chiropractor for spinal manipulation and chronic low back pain (cLBP) outcomes and to determine the efficacy of manipulation by comparison with a light massage control.

STUDY DESIGN/SETTING: Practice-based randomized controlled trial. **PATIENT SAMPLE:** Four hundred participants with cLBP.

OUTCOME MEASURES: The primary cLBP outcomes were the 100-point modified Von Korff pain intensity and functional disability scales evaluated at the 12- and 24week primary end points. Secondary outcomes included days with pain and functional disability, pain unpleasantness, global perceived improvement, medication use, and general health status.

METHODS: One hundred participants with cLBP were randomized to each of four dose levels of care: 0, 6, 12, or 18 sessions of spinal manipulation from a chiropractor. Participants were treated three times per week for 6 weeks. At sessions when manipulation was not assigned, they received a focused light massage control. Covariate-adjusted linear dose effects and comparisons with the no-manipulation control group were evaluated at 6, 12, 18, 24, 39, and 52 weeks. **RESULTS:** For the primary outcomes, mean pain and disability improvement in the manipulation groups were 20 points by 12 weeks and sustainable to 52 weeks. Linear dose-response effects were small, reaching about two points per six manipulation sessions at 12 and 52 weeks for both variables (p<.025). At 12 weeks, the greatest differences from the no-manipulation control were found for 12 sessions (8.6 pain and 7.6 disability points, p<.025); at 24 weeks, differences were negligible; and at 52 weeks, the greatest group differences were seen for 18 visits (5.9 pain and 8.8 disability points, p<.025).

CONCLUSIONS: The number of spinal manipulation visits had modest effects on cLBP outcomes above those of 18 hands-on visits to a chiropractor. Overall, 12 visits yielded the most favorable results but was not well distinguished from other dose levels.

2013 - Outcomes of osteopathic manual treatment for chronic low back pain according to baseline pain severity:

Results from the OSTEOPATHIC Trial Manual Therapy, 06/14/2013 Clinical Article Licciardone JC et al. - The aim of this study is to assess response to osteopathic manual treatment (OMT) according to baseline severity of chronic low back pain (LBP). The large effect size for OMT in providing substantial pain reduction in patients with chronic LBP of high severity was associated with clinically important improvement in back-specific functioning. Thus, OMT may be an attractive option in such patients before proceeding to more invasive and costly treatments.

Methods

The osteopathic trial used a randomized, double-blind, sham-controlled, 2×2 factorial design to study OMT for chronic LBP.

A total of 269 (59%) patients reported low baseline pain severity (LBPS) (<50mm/100mm), whereas 186 (41%) patients reported high baseline pain severity (HBPS) (\geq 50mm/100mm).

Six OMT sessions were provided over eight weeks and outcomes were assessed at week 12.

The primary outcome was substantial LBP improvement (\geq 50% pain reduction). The Roland–Morris Disability Questionnaire (RMDQ) and eight other secondary outcomes were also studied.

Response ratios (RRs) and 95% confidence intervals (CIs) were used in conjunction with Cochrane Back Review Group criteria to determine OMT effects.

Results

There was a large effect size for OMT in providing substantial LBP improvement in patients with HBPS (RR, 2.04; 95% CI, 1.36–3.05; P<0.001).

This was accompanied by clinically important improvement in back-specific functioning on the RMDQ (RR, 1.80; 95% CI, 1.08–3.01; P=0.02).

Both RRs were significantly greater than those observed in patients with LBPS. Osteopathic manual treatment was consistently associated with benefits in all other secondary outcomes in patients with HBPS, although the statistical significance and clinical relevance of results varied.

Note: The terms manipulation and/or adjustment are synonomous terms and whether undertaken by an osteopath or chiropractor, the action is the same and whatever results obtained through that action may be attributed to that action - the act of manipulation and/or adjustment.

2013 - Nondrug Treatment for Chronic Tension Headache in Teens

American Academy of Pain Management (AAPM) 24th Annual Clinical Meeting. Abstract #25. Presented September 27, 2013.

P Przekop, DO, PhD, Betty Ford Center, Rancho Mirage, and Loma Linda University School of Medicine, Loma Linda, California,

Chronic tension-type headache (CTTH), which may affect up to 20% of teens, can be successfully treated without pharmacologic agents, a new study shows. A retrospective review of 83 adolescents diagnosed with CTTH found that osteopathic manipulation and instruction in daily mindfulness and the traditional Chinese practice of gi gong was more effective than pharmacologic therapy in relieving their headaches.

To compare the efficacy of pharmacologic vs nonpharmacologic treatment in teens with CTTH, Przekop and his team reviewed the charts of 83 adolescents (67 girls and 16 boys) who presented to their outpatient clinic for headache management between 2009 and 2013. Their average age was 15.7 years (range, 13 to 18 years).

There were 2 treatment groups. Group 1 (n = 44 patients) received amitriptyline or gabapentin as daily preventive medication. Group 2 (n = 39 patients) received bimonthly osteopathic manipulation and instruction in daily mindfulness and internal qi gong.

Qi gong is a traditional Chinese practice that aligns breathing, slow, repeated movements and awareness to promote healing, The instruction on how to do mindfulness involves telling the patients to close their eyes, get in touch with what they were feeling inside, breathe, and stop the story going on in their head, to stop the story. The teens in the experimental group were taught an internal qi gong routine that consisted of 6 simple moves that they practiced each day.

Both groups were assessed at study entry, 3 months, and 6 months to see whether the number and intensity of their headaches changed and whether the intervention affected their general health and quality of life. Both groups improved, but the improvement was much more dramatic in the group that underwent manipulation, did qi gong and practiced mindfulness.

The nonpharmacologic intervention produced better results in headache frequency, headache pain intensity, general health, social activity, and number of tender points in the trapezius, cervical spine, and superior occipital notch than did pharmacologic treatment (P = .001 for all 5 measures).

Over the 6-month period, headache frequency decreased from 23.9 to 16.4 in the pharmacologic treatment group and from 22.3 to 4.9 in the nonpharmacologic group. One potential problem is that insurance often will not pay for nonpharmacologic treatment, Dr. Przekop noted.

2013 - Adding chiropractic manipulative therapy to standard medical care for patients with acute low back pain: results of a pragmatic randomized comparative effectiveness study.

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Goertz CM, et al Spine 2013 Apr 15;38(8):627-34. doi: 10.1097/BRS.0b013e31827733e7. Source Palmer Center for Chiropractic Research, Davenport, IA 52803, USA. christine.goertz@palmer.edu Abstract STUDY DESIGN: Randomized controlled trial. OBJECTIVE: To assess changes in pain levels and physical functioning in response to standard medical care (SMC) versus SMC plus chiropractic manipulative therapy (CMT) for the treatment of low back pain (LBP) among 18 to 35-year-old active-duty military personnel.

SUMMARY OF BACKGROUND DATA:

LBP is common, costly, and a significant cause of long-term sick leave and work loss. Many different interventions are available, but there exists no consensus on the best approach. One intervention often used is manipulative therapy. Current evidence from randomized controlled trials demonstrates that manipulative therapy may be as effective as other conservative treatments of LBP, but its appropriate role in the healthcare delivery system has not been established.

METHODS:

Prospective, 2-arm randomized controlled trial pilot study comparing SMC plus CMT with only SMC. The primary outcome measures were changes in back-related pain on the numerical rating scale and physical functioning at 4 weeks on the Roland-Morris Disability Questionnaire and back pain functional scale (BPFS).

RESULTS:

Mean Roland-Morris Disability Questionnaire scores decreased in both groups during the course of the study, but adjusted mean scores were significantly better in the SMC plus CMT group than in the SMC group at both week 2 (P < 0.001) and week 4 (P = 0.004). Mean numerical rating scale pain scores were also significantly better in the group that received CMT. Adjusted mean back pain functional scale scores were significantly higher (improved) in the SMC plus CMT group than in the SMC group at both week 2 (P < 0.001) and week 4 (P = 0.004).

CONCLUSION:

The results of this trial suggest that CMT in conjunction with SMC offers a significant advantage for decreasing pain and improving physical functioning when compared with only standard care, for men and women between 18 and 35 years of age with acute LBP. PMID:23060056 [PubMed - in process]

2012 - University of Pittsburgh Medical Center (UPMSC).

This year (2012) UPMSC mandated chiropractic care as a first-line conservative treatment for a 3-month period, <u>prior</u> to any advanced imaging and/or surgical consultation. <u>http://www.upmchealthplan.com/pdf/PandP/MP.059.pdf</u>

2012 - Predictors of Improvement in Patients With Acute and Chronic Low Back Pain Undergoing Chiropractic Treatment

Journal of Manipulative and Physiological Therapeutics Volume 35, Issue 7, p 525-533, Sept 2012; CK Peterson, DC, MMedEd, J Bolton, PhD, MAEdB. K Humphreys, DC, PhD

Abstract

Objectives

The purpose of this study was to investigate outcomes and prognostic factors in patients with acute or chronic low back pain (LBP) undergoing chiropractic treatment.

Methods

This was a prognostic cohort study with medium-term outcomes. Adult patients with LBP of any duration who had not received chiropractic or manual therapy in the prior 3 months were recruited from multiple chiropractic practices in Switzerland. Participating doctors of chiropractic were allowed to use their typical

treatment methods (such as chiropractic manipulation, soft tissue mobilization, or other methods) because the purpose of the study was to evaluate outcomes from routine chiropractic practice. Patients completed a numerical pain rating scale and Oswestry disability questionnaire immediately before treatment and at 1 week, 1 month, and 3 months after the start of treatment, together with self-reported improvement using the Patient Global Impression of Change.

Results Patients with acute (<4 weeks; n = 523) and chronic (>3 months; n = 293) LBP were included. Baseline mean pain and disability scores were significantly (P < .001) higher in patients with acute LBP. In both groups of patients, there were significant (P < .0001) improvements in mean scores of pain and disability at 1 week, 1 month, and 3 months, although these change scores were significantly greater in the acute group. Similarly, a greater proportion of patients in the acute group reported improvement at each follow-up. The most consistent predictor was self-reported improvement at 1 week, which was independently associated with improvement at 1 month (adjusted odds ratio [OR], 2.4 [95% confidence interval, 1.3-4.5] and 5.0 [2.4-10.6]) and at 3 months (2.9 [1.3-6.6] and 3.3 [1.3-8.7]) in patients with acute and chronic pain, respectively. The presence of radiculopathy at baseline was not a predictor of outcome.

Conclusions Patients with chronic and acute pain reporting that they were "much better" or "better" on the Patient Global Impression of Change scale at 1 week after the first chiropractic visit were 4 to 5 times more likely to be improved at both 1 and 3 months compared with patients who were not improved at 1 week. Patients with acute pain reported more severe pain and disability initially but recovered faster. Patients with chronic and acute back pain both reported good outcomes, and most patients with radiculopathy also improved.

2012 - Spinal Manipulation Epidemiology: Systematic Review of Cost Effectiveness - Studies

J Electromyogr Kinesiol. 2012 (Oct); 22 (5): 655–662 Michaleff ZA, Lin CW, Maher CG, van Tulder MW.

The George Institute for Global Health, The University of Sydney, Missenden Road, Sydney, NSW 2050, Australia. zmichaleff@georgeinstitute.org.au

BACKGROUND: Spinal manipulative therapy (SMT) is frequently used by health professionals to manage spinal pain. With many treatments having comparable outcomes to SMT, determining the cost-effectiveness of these treatments has been identified as a high research priority.

OBJECTIVE: To investigate the cost-effectiveness of SMT compared to other treatment options for people with spinal pain of any duration.

METHODS: We searched eight clinical and economic databases and the reference lists of relevant systematic reviews. Full economic evaluations conducted alongside randomised controlled trials with at least one SMT arm were eligible for inclusion. Two authors independently screened search results, extracted data and assessed risk of bias using the CHEC-list.

RESULTS: Six cost-effectiveness and cost-utility analysis were included. All included studies had a low risk of bias scoring =16/19 on the CHEC-List. SMT was found to be a cost-effective treatment to manage neck and back pain when used

alone or in combination with other techniques compared to GP care, exercise and physiotherapy.

CONCLUSIONS: This review supports the use of SMT in clinical practice as a cost-effective treatment when used alone or in combination with other treatment approaches. However, as this conclusion is primarily based on single studies more high quality research is needed to identify whether these findings are applicable in other settings.

2012 - Value of Chiropractic Services at an On-site Health Center

J Occupational and Environmental Med 2012 (Aug);54 (8):917-921 ~

Curt A. Krause, DC; Lisa Kaspin, PhD; Kathleen M. Gorman, MPH; Ross M. Miller, MD, MPH

There has been conflicting research and an ongoing debate regarding the cost value of chiropractic. At the center of the debate is the question: Does chiropractic add to or reduce the total cost of care? The most recent and better designed studies suggest that chiropractic care can not only reduce the immediate cost of an episode of care, but reduce the recurrence of subsequent bouts of conditions such as low back pain. These musculoskeletal conditions are a heavy financial burden on society often requiring expensive tests to pinpoint the exact diagnosis.

This study, offering on-site chiropractic care, versus off-site physical therapy, concluded that "[These results suggest that] chiropractic services offered at on-site health centers may promote lower utilization of certain health care services, while improving musculoskeletal function." Additionally, patients who receive chiropractic treatment often have a more conservative, less invasive treatment profile which can significantly reduce the overall cost of treatment.

Cerner Healthe Clinic, Kansas City, MO; Cerner LifeSciences Consulting, Beverly Hills, CA; and Cerner Employer Services, Cerner Corporation, Beverly Hills, CA. **OBJECTIVE:** Chiropractic care offered at an on-site health center could reduce the economic and clinical burden of musculoskeletal conditions.

METHODS: A retrospective claims analysis and clinical evaluation were performed to assess the influence of on-site chiropractic services on health care utilization and outcomes.

RESULTS: Patients treated off-site were significantly more likely to have physical therapy (P < 0.0001) and outpatient visits (P < 0.0001). In addition, the average total number of health care visits, radiology procedures, and musculoskeletal medication use per patient with each event were significantly higher for the off-site group (all P < 0.0001). Last, headache, neck pain, and low back pain-functional status improved significantly (all P < 0.0001).

CONCLUSIONS: These results suggest that chiropractic services offered at onsite health centers may promote lower utilization of certain health care services, while improving musculoskeletal function.

2011 - A Hospital-Based Standardized Spine Care Pathway: Report of a Multidisciplinary, Evidence-Based Process

J Manipulative Physiol Ther 2011 (Feb); 34 (2): 98–106

A health care facility (Jordan Hospital) implemented a multidimensional spine care pathway, utilizing a multidisciplinary, evidence-based, standardized process, to improve clinical outcomes, and to reduce the costs associated with treatment and diagnostic testing. 518 consecutive patients were assessed and 83% (432) were classified and and then treated by doctors of chiropractic and/or physical therapists. 95% of patients treated by DCs rated their care as "excellent." This was accomplished with a relatively low cost and with high patient satisfaction. The authors concluded that "interprofessional collaboration between doctors of chiropractic, physical therapists, and medical doctors within teams improved spine care; that promotion of care coordination reduced unnecessary testing and procedures; and the standardization of LBP management reduced practice variations and significantly reduced the costs of care."

2011 - Cost-effectiveness of Guideline-endorsed Treatments for Low Back Pain: A Systematic Review

Eur Spine J. 2011 (Jan 13) [Epub ahead of print]

This 2011 systematic review of the cost-effectiveness of treatments endorsed in the APS-ACP guidelines found that spinal manipulation was cost-effective for subacute and chronic low back pain, as were other methods usually within the chiropractor's scope of practice (interdisciplinary rehabilitation, exercise, and acupuncture). Massage alone was unlikely to be cost-effective. This review found evidence supporting the cost-effectiveness of the guideline-endorsed treatments of interdisciplinary rehabilitation, exercise, acupuncture, spinal manipulation and cognitive-behavioural therapy for sub-acute or chronic LBP. It also found no evidence at all on the cost-effectiveness of medication for low back pain.

2011 - Health Maintenance Care in Work-Related Low Back Pain and its association with Disability Recurrence

Journal of Occupational and Environmental Medicine 2011 (Apr); 53 (4):396–404; <u>http://www.ncbi.nlm.nih.gov/pubmed/21407100</u>

This study found that you are twice as likely to end up disabled if you get your care from a Physical Therapist, rather than from a DC, and that patients were 60% more likely to be disabled if they choose an MD to manage their care, rather than a DC.

2011 - Health Maintenance Care in Work-Related Low Back Pain and Its Association With Disability Recurrence

Journal of Occupational and Environmental Medicine 2011 (Apr); 53 (4):396–404 Willetts J, Wasiak R.

From the Center for Disability Research at the Liberty Mutual Research Institute for Safety (Dr Cifuentes and Ms Willetts) and University of Massachusetts Lowell (Dr Cifuentes), Hopkinton, Mass; and Center for Health Economics & Science Policy at United BioSource Corporation, London, United Kingdom (Dr Wasiak).

This study is unique in that it was conducted by the Center for Disability Research at the Liberty Mutual Research Institute for Safety and the University of

Massachusetts Lowell, Hopkinton, Mass; and the Center for Health Economics & Science Policy at United BioSource Corporation, London, United Kingdom.

Their objective was to compare the occurrences of repeated disability episodes between types of health care providers, who treat claimants with new episodes of work-related low back pain (LBP). They followed 894 patients over 1-year, using workers' compensation claims data.

By controlling for demographics and severity, they determined the hazard ratio (HR) for disability recurrence between 3 types of providers:

Physical Therapists (PT), Physicians (MD), or Chiropractors (DC).

The results are quite interesting:

For PTs : HR = 2.0For MDs : HR = 1.6For DCs : HR = 1.0

Statistically, this means you are twice as likely to end up disabled if you got your care from a Physical Therapists (PT), rather than from a chiropractor. You're also 60% more likely to be disabled if you choose a Physicians (MD) to manage your care, rather than a chiropractor.

The authors concluded:

"In work-related nonspecific LBP, the use of health maintenance care provided by physical therapist or physician services was associated with a higher disability recurrence than with chiropractic services."

Abstract:

OBJECTIVES: To compare occurrence of repeated disability episodes across types of health care providers who treat claimants with new episodes of work-related low back pain (LBP).

METHOD: A total of 894 cases followed 1 year using workers' compensation claims data. Provider types were defined for the initial episode of disability and subsequent episode of health maintenance care.

RESULTS: Controlling for demographics and severity, the hazard ratio [HR] of disability recurrence for patients of physical therapists (HR = 2.0; 95% confidence interval [CI] = 1.0 to 3.9) or physicians (HR = 1.6; 95% CI = 0.9 to 6.2) was higher than that of chiropractor (referent, HR = 1.0), which was similar to that of the patients non-treated after return to work (HR = 1.2; 95% CI = 0.4 to 3.8). **CONCLUSIONS:** In work-related nonspecific LBP, the use of health maintenance care provided by physical therapist or physician services was associated with a higher disability recurrence than in chiropractic services or no treatment.

2011 - A Hospital-Based Standardized Spine Care Pathway: Report of a Multidisciplinary, Evidence-Based Process

http://www.chiro.org/LINKS/ABSTRACTS/Hospital-Based_Standardized_Spine.shtml J Manipulative Physiol Ther 2011 (Feb); 34 (2): 98–106

Paskowski I, Schneider M, Stevans J, Ventura JM, Justice BD. Medical Director, Medical Back Pain Program, Jordan Hospital, Plymouth, Mass. A health care facility (Jordan Hospital) implemented a multidimensional spine care pathway, utilizing a multidisciplinary, evidence-based, standardized process, to improve clinical outcomes, and to reduce the costs associated with treatment and diagnostic testing. 518 consecutive patients were assessed and 83% (432) were classified and and then treated by doctors of chiropractic and/or physical therapists. 95% of patients treated by DCs rated their care as "excellent." This was accomplished with a relatively low cost and with high patient satisfaction. The authors concluded that "interprofessional collaboration between doctors of chiropractic, physical therapists, and medical doctors within teams improved spine care; that promotion of care coordination reduced unnecessary testing and procedures; and the standardization of LBP management reduced practice variations and significantly reduced the costs of care."

Using the National Center for Quality Assurance (NCQA) Back Pain Recognition Program (BPRP) as its framework, the SCP provided patients with the five care options cited as the most effective in the back pain literature: spinal manipulation, extension and flexion directional preference exercises, core stabilization exercises, and mechanical traction.

"Lower back pain is a common condition affecting an estimated 90 percent of the population at some time," says Ian C. Paskowski, DC, lead author and medical director, Medical Back Pain Program at Jordan Hospital, Plymouth, Mass., the site from which this study's data was derived. "Current methods of relieving LBP are often uncoordinated, inefficient and expensive. However, our team of researchers was the first to implement an evidence-based, standardized SCP, which aligned individual patients with the appropriate conservative care option. As predicted, the results were improved patient health and satisfaction rates, with decreased costs."

The LBP program at Jordan Hospital, managed chiefly by chiropractors, treated 518 patients in the first six months of the program, using a two-tiered clinical management approach. Of the total patient population, 402 were exclusively cared for by DCs who achieved successful treatment outcomes in an average of just 5.2 visits at the extremely low cost of only \$302 per case, while maintaining a patient satisfaction rate above 95 percent. Self-reported pain and disability scores were reduced by about 70% over the course of just a few weeks.

Primary Care Physicians (PCPs) have traditionally been the providers to initially see LBP patients. "We have demonstrated that when this spine care pathway is offered to PCPs, they will utilize these evidence-based guidelines and chiropractic services" says Paskowski. "I largely credit our Doctors of Chiropractic for achieving these excellent clinical outcomes and attaining such high patient satisfaction rates. Their dedication to individual patient needs and a patient-centered approach aligns

flawlessly with the medical home model and yields remarkable results. We anticipate that this SCP will become the globalized framework for uniformity and consistency in healthcare for LBP management, and that chiropractors will become the non-surgical spine care experts in the health care system."

Abstract:

OBJECTIVE: A health care facility (Jordan Hospital) implemented a multidimensional spine care pathway (SCP) using the National Center for Quality Assurance (NCQA) Back Pain Recognition Program (BPRP) as its foundation. The purpose of this report is to describe the implementation and results of a multidisciplinary, evidence-based, standardized process to improve clinical outcomes and reduce costs associated with treatment and diagnostic testing.

METHODS: A standardized SCP was developed to improve the quality of back pain care. The NCQA BPRP provided the framework for the SCP to determine the standard of quality care delivered. Patients were triaged, and suitable patients were categorized into 1 of 5 classifications based upon history and examination, directional exercise flexion or "extension biases," spinal manipulation, traction, or spinal stabilization exercises.

RESULTS: The findings for 518 consecutive patients were included. One hundred sixteen patients (10%) were seen once and triaged to specialty care; 7% of patients received magnetic resonance imagings. Four hundred thirty-two patients (83%) were classified and treated by doctors of chiropractic and/or physical therapists. Results for the patients treated by doctors of chiropractic were mean of 5.2 visits, mean cost per case of \$302, mean intake pain rating score of 6.2 of 10, and mean discharge score of 1.9 of 10; 95% of patients rated their care as "excellent."

CONCLUSIONS: By adopting the NCQA BPRP as an SCP, training physicians in this SCP, and using a back pain classification, Jordan Hospital Spine Care demonstrated the quality and value of care rendered to a population of patients. This was accomplished with a relatively low cost and with high patient satisfaction.

2010 - Cost of Care for Common Back Pain Conditions Initiated With Chiropractic Doctor vs Medical Doctor/Doctor of Osteopathy as First Physician: Experience of One Tennessee-Based General Health Insurer J Manipulative Physiol Ther 2010 (Nov); 33 (9): 640–643

This important 2010 study evaluated low back pain care for Blue Cross Blue Shield of Tennessee's intermediate and large group fully insured population over a twoyear period. The 85,000 BCBS subscribers in the insured study population had open access to MDs and DCs through self-referral, and there were no limits applied to the number of MD/DC visits allowed and no differences in co-pays. Thus, the data from this study reflect what happens when chiropractic and medical services compete on a level playing field. The researchers, led by an actuary, compared the costs of low back pain care initiated with a doctor of chiropractic with care initiated through a medical doctor or osteopathic physician. They found that costs for the chiropractic group were 40 percent lower. Even after factoring in the severity of the conditions with which patients presented, costs when initiating care with a DC rather than an MD/DO were 20 percent lower. The researchers concluded that insurance companies that restrict access to chiropractic care for low back pain treatment may inadvertently pay more for care than they would if they removed such restrictions. According to this analysis, had all of the low back cases initiated care with a DC, this would have led to an annual cost savings of \$2.3 million for BCBS of Tennessee.

2010 - Cost of Care for Common Back Pain Conditions Initiated With Chiropractic Doctor vs Medical Doctor/Doctor of Osteopathy as First Physician: Experience of One Tennessee-Based General Health InsurerJ

Manipulative Physiol Ther 2010 (Nov); 33 (9): 640–643

http://www.jmptonline.org/article/S0161-4754%2810%2900216-2/abstract Paid costs for episodes of care initiated with a DC were almost 40% less than episodes initiated with an MD. Even after risk adjusting each patient's costs, we found that episodes of care initiated with a DC were 20% less expensive than episodes initiated with an MD. This clearly demonstrates the savings that are possible when a patient is permitted to choose a chiropractor, rather than an MD for their care.

2009 - Functional Scores and Subjective Responses of Injured Workers With Back or Neck Pain Treated With Chiropractic Care in an Integrative Program: A Retrospective Analysis of 100 Cases

J Manipulative Physiol Ther. 2009 (Nov); 32 (9): 765–771

Injured workers with either an acute or subacute injury had significantly lower posttreatment FRI scores compared with individuals with a chronic injury. The FRI change scores were significantly greater in the acute group compared with either the subacute or chronic injured workers. Workers in all categories showed improved post-treatment tolerance for work-related activities and significantly lower posttreatment subjective pain scores. The study identified positive effects of chiropractic management included in integrative care when treating work-related neck or back pain. Improvement in both functional scores and subjective response was noted in all 3 time-based phases of patient status (acute, subacute, and chronic).

2009 - Estimating Cost of Care for Patients With Acute Low Back Pain: A Retrospective Review of Patient Records

WT Crow, DO; DR Willis, DO, MBA

Florida Hospital East Orlando, Orlando.

Abstract

Context: Low back pain (LBP) has a major economic impact in the United States, with total costs related to this condition exceeding \$100 billion per year.

Objective: To estimate the cost of standard care compared to standard care plus osteopathic manipulative treatment (OMT) for acute LBP of less than 6 months' duration.

Methods: A retrospective review of electronic medical records from patients who visited Florida Hospital East Orlando in Orlando. All patients had LBP of less than 6 months' duration and had received care between January 1, 2002, and December 31, 2005. The control group comprised patients who received standard care; the

study group consisted of patients who received OMT in addition to standard care. Healthcare utilization (eg, radiologic scans, prescriptions) was determined by "episodes of care," and costs were averaged per patient.

Results: A total of 1556 patients and 2030 episodes of care met inclusion criteria. Compared with subjects in the control group, individuals in the OMT group had an average of 0.5 more office visits per EOC, resulting in 38% more office visits.

However, OMT patients had 18.5% fewer prescriptions written, 74.2% fewer radiographs, 76.9% fewer referrals, and 90% fewer magnetic resonance imaging scans. In the OMT group, total average costs were \$38.26 lower (P=.02), and average prescription costs were \$19.53 lower (P<.001). Patients in the OMT group also had \$63.81 less average radiologic costs (P<.0001).

Conclusion: Osteopathic manipulative treatment may reduce costs for the management of acute LBP. Further research in a prospective study is needed.

2007 - Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society

Roger Chou, MD; Amir Qaseem, MD, PhD, MHA; Vincenza Snow, MD; Donald Casey, MD, MPH, MBA; J. Thomas Cross Jr, MD, MPH; Paul Shekelle, MD, PhD; Douglas K. Owens, MD, MS, Clinical Efficacy Assessment Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel*

Ann Intern Med. 2007;147(7):478-491.

Abstract

Recommendation 1: Clinicians should conduct a focused history and physical examination to help place patients with low back pain into 1 of 3 broad categories: nonspecific low back pain, back pain potentially associated with radiculopathy or spinal stenosis, or back pain potentially associated with another specific spinal cause. The history should include assessment of psychosocial risk factors, which predict risk for chronic disabling back pain (strong recommendation, moderate-quality evidence).

Recommendation 2: Clinicians should not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain (strong recommendation, moderate-quality evidence).

Recommendation 3: Clinicians should perform diagnostic imaging and testing for patients with low back pain when severe or progressive neurologic deficits are present or when serious underlying conditions are suspected on the basis of history and physical examination (strong recommendation, moderate-quality evidence).

Recommendation 4: Clinicians should evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with magnetic resonance imaging (preferred) or computed tomography only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy) (strong recommendation, moderate-quality evidence).

Recommendation 5: Clinicians should provide patients with evidence-based information on low back pain with regard to their expected course, advise patients to remain active, and provide information about effective self-care options (strong recommendation, moderate-quality evidence).

Recommendation 6: For patients with low back pain, clinicians should consider the use of medications with proven benefits in conjunction with back care information and self-care. Clinicians should assess severity of baseline pain and functional deficits, potential benefits, risks, and relative lack of long-term efficacy and safety data before initiating therapy (strong recommendation, moderate-quality evidence). For most patients, first-line medication options are acetaminophen or nonsteroidal anti-inflammatory drugs.

Recommendation 7: For patients who do not improve with self-care options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits"for acute low back pain, spinal manipulation; for chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation (weak recommendation, moderate-quality evidence). This paper, written by Roger Chou, MD; Amir Qaseem, MD, PhD, MHA; Vincenza Snow, MD; Donald Casey, MD, MPH, MBA; J. Thomas Cross Jr., MD, MPH; Paul Shekelle, MD, PhD; and Douglas K. Owens, MD, MS, was developed for the American College of Physicians' Clinical Efficacy Assessment Subcommittee and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel. For members of these groups, see end of text. Approved by the American College of Physicians Board of Regents on 14 July 2007. Approved by the American Pain Society Board Executive Committee on 18 July 2007.

2007 - 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. Chou R, Huffman LH. 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, lowlevel 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 searchers 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.

2007 - Clinical Utilization and Cost Outcomes from an Integrative Medicine Independent Physician Association: An Additional 3-year Update

J Manipulative Physiol Ther 2007 (May); 30 (4): 263–269 http://www.ncbi.nlm.nih.gov/pubmed/17509435

A new retrospective analysis of 70,274 member-months in a 7-year period within an IPA, comparing medical management to chiropractic management, demonstrated decreases of 60.2% in-hospital admissions, 59.0% hospital days, 62.0% outpatient surgeries and procedures, and 83% pharmaceutical costs when compared with conventional medicine IPA performance. This clearly demonstrates that chiropractic nonsurgical nonpharmaceutical approaches generates reductions in both clinical and cost utilization when compared with PCPs using conventional medicine alone.

2006 - 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.

2006 - Efficacy Of Treating Low Back Pain And Dysfunction Secondary To Osteoarthritis: Chiropractic Care Compared With Moist Heat Alone; KL Beyerman, RN, EdD,M Palmerino.

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.

2005 - Effects of a Managed Chiropractic Benefit on the Use of Specific Diagnostic and Therapeutic Procedures in the Treatment of Low Back and Neck Pain

J Manipulative Physiol Ther 2005 (Oct); 28 (8): 564–569 http://www.ncbi.nlm.nih.gov/pubmed/16226623

For the treatment of low back and neck pain, the inclusion of a chiropractic benefit resulted in a reduction in the rates of surgery, advanced imaging, inpatient care, and plain-film radiographs. This effect was greater on a per-episode basis than on a per-patient basis.

2005 - Cost-effectiveness of Medical and Chiropractic Care for Acute and Chronic Low Back Pain

J Manipulative Physiol Ther 2005 (Oct); 28 (8): 555–563 http://www.ncbi.nlm.nih.gov/pubmed/16226622

Acute and chronic chiropractic patients experienced better outcomes in pain, functional disability, and patient satisfaction. Chiropractic care appeared relatively cost-effective for the treatment of chronic LBP. Chiropractic and medical care performed comparably for acute patients. Practice-based clinical outcomes were consistent with systematic reviews of spinal manipulation efficacy: manipulationbased therapy is at least as good as and, in some cases, better than other therapeusis. This evidence can guide physicians, payers, and policy makers in evaluating chiropractic as a treatment option for low back pain.

2004 - Clinical and Cost Outcomes Of An Integrative Medicine IPA

J Manipulative Physiol Ther 2004 (Jun); 27 (5): 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.

2004 - Chiropractic Care: Is It Substitution Care or Add-on Care in Corporate Medical Plans?

J Occup Environ Med 2004 (Aug); 46 (8): 847–855 http://www.ncbi.nlm.nih.gov/pubmed/15300137

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.

2004 - Comparative Analysis of Individuals with and Without Chiropractic Coverage: Patient Characteristics, Utilization, and Costs

Archives of Internal Medicine 2004 (Oct 11); 164 (18): 1985–1892 http://archinte.ama-assn.org/cgi/content/full/164/18/1985

A 4-year retrospective claims data analysis comparing more than 700,000 health plan members within a managed care environment found that members had lower annual total health care expenditures, utilized x-rays and MRIs less, had less back surgeries, and for patients with chiropractic coverage, compared with those without coverage, also had lower average back pain episode-related costs (\$289 vs \$399). The authors concluded: "Access to managed chiropractic care may reduce overall health care expenditures through several effects, including (1) positive risk selection; (2) substitution of chiropractic for traditional medical care, particularly for spine conditions; (3) more conservative, less invasive treatment profiles; and (4) lower health service costs associated with managed chiropractic care

2004 - An Evaluation of Medical and Chiropractic Provider Utilization and Costs: Treating Injured Workers in North Carolina

J Manipulative Physiol Ther 2004 (Sep); 27 (7): 442–448 http://www.ncbi.nlm.nih.gov/pubmed/15389175

These data, with the acknowledged limitations of an insurance database, indicate lower treatment costs, less workdays lost, lower compensation payments, and lower utilization of ancillary medical services for patients treated by DCs. Despite the lower cost of chiropractic management, the use of chiropractic services in North Carolina appears very low.

2004 - Clinical and Cost Outcomes of an Integrative Medicine IPA

J Manipulative Physiol Ther 2004 (Jun) ; 27 (5):336–347 http://www.ncbi.nlm.nih.gov/pubmed/15195041

Analysis of clinical and cost outcomes on 21,743 member months over a 4-year period demonstrated decreases of 43.0% in hospital admissions per 1000, 58.4% hospital days per 1000, 43.2% outpatient surgeries and procedures per 1000, and 51.8% pharmaceutical cost reductions when compared with normative conventional medicine IPA performance for the same HMO product in the same geography over the same time frame.

2004 - A Practice-Based Study of Patients with Acute and Chronic Low Back Pain Attending Primary Care and Chiropractic Physicians: Two-Week to 48-Month Follow-up

J Manipulative Physiol Ther 2004 (Mar); 27 (3): 160–169 http://www.ncbi.nlm.nih.gov/pubmed/15129198

This study found that chiropractic care is more effective than medical care at treating chronic low-back pain in patients' first year of symptoms.

2004 - United Kingdom Back Pain, Exercise and Manipulation Randomized Trial: Cost Effectiveness of Physical Treatments for Back Pain In Primary Care

British Medical Journal 2004 (Dec 11); 329 (7479): 1381

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.

2004 - Comparative Analysis of Individuals With and Without Chiropractic CoveragePatient Characteristics, Utilization, and Costs FREE

Arch Intern Med. 2004;164(18):1985-1992. Antonio P. Legorreta, MD, MPH, et al

ABSTRACT

Background Back pain accounts for more than \$100 billion in annual US health care costs and is the second leading cause of physician visits and hospitalizations. This study ascertains the effect of systematic access to chiropractic care on the overall and neuromusculoskeletal-specific consumption of health care resources within a large managed-care system.

Methods A 4-year retrospective claims data analysis comparing more than 700 000 health plan members with an additional chiropractic coverage benefit and 1 million members of the same health plan without the chiropractic benefit. **Results** Members with chiropractic insurance coverage, compared with those without coverage, had lower annual total health care expenditures (\$1463 vs \$1671 per member per year, *P*<.001). Having chiropractic coverage was associated with a 1.6% decrease (*P* = .001) in total annual health care costs at the health plan level. Back pain patients with chiropractic coverage, compared withthose without coverage, had lower utilization (per 1000 episodes) of plain radiographs (17.5 vs 22.7, *P*<.001), low back surgery (3.3 vs 4.8, *P*<.001), hospitalizations (9.3 vs 15.6, *P*<.001), and magnetic resonance imaging (43.2 vs 68.9, *P*<.001). Patients with chiropractic coverage, also had lower average back pain episode–related costs (\$289 vs \$399, *P*<.001). **Conclusions** Access to managed chiropractic care may reduce overall health care expenditures through several effects, including (1) positive risk selection; (2) substitution of chiropractic for traditional medical care particularly for spine

substitution of chiropractic for traditional medical care, particularly for spine conditions; (3) more conservative, less invasive treatment profiles; and (4) lower health service costs associated with managed chiropractic care. Systematic access to managed chiropractic care not only may prove to be clinically beneficial but also may reduce overall health care costs.

2003 - A Randomized Trial of Combined Manipulation, Stabilizing Exercises, and Physician Consultation Compared to Physician Consultations Alone for Chronic Low Back Pain.

Niemisto L, Lahtinen-Suopanki T, et al.

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.

2003 - Chronic Spinal Pain - A Randomized Clinical Trial Comparing Medication, Acupuncture and Spinal Manipulation. Giles L, Muller R. *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%).

2003 - Patterns and Perceptions of Care for Treatment of Back and Neck Pain: Results of a National Survey.

Wolsko P, Eisenberg D, Davis R, Kessler R, Phillips R. *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.

2003 - Cost effectiveness of physiotherapy, manual therapy, and general practitioner care for neck pain: economic evaluation alongside a randomised controlled trial

British Medical Journal 2003 (Apr 26); 326 (7395):911 http://www.bmj.com/content/326/7395/911.full

A hands-on approach to treating neck pain by manual therapy may help people get better faster and at a lower cost than more traditional treatments, according to this study. After seven and 26 weeks, they found significant improvements in recovery rates in the manual therapy group compared to the other 2 groups. For example, at week seven, 68% of the manual therapy group had recovered from their neck pain vs. 51% in the physical therapy group and 36% in the medical care group.

2003 - Chiropractic treatment of workers' compensation claimants in the state of Texas

MGT of America, Austin, Texas ~ February 2003 <u>http://www.dynamicchiropractic.com/mpacms/dc/article.php?id=9212</u> In 2002, the Texas Chiropractic Association (TCA) commissioned an independent study to determine the use and effectiveness of chiropractic with regard to workers' compensation, the results of which were published in February 2003. According to the report, chiropractic care was associated with significantly lower costs and more rapid recovery in treating workers with low-back injuries. They found: Lower back and neck injuries accounted for 38 percent of all claims costs. Chiropractors treated about 30 percent of workers with lower back injuries, but were responsible for only 17.5 percent of the medical costs and 9.1 percent of the total costs. These findings were even more intertesting: The average claim for a worker with a low-back injury was \$15,884. However, if a worker received at least 75 percent of his or her care from a chiropractor, the total cost per claimant decreased by nearly one-fourth to \$12,202. If the chiropractor provided at least 90 percent of the care, the average cost declined by more than 50 percent, to \$7,632.

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

2002 - Manual Therapy, Physical Therapy, or Continued Care by a General Practitioner for Patients with Neck Pain. A Randomized, Controlled Trial

Ann Intern Med 2002 (May 21); 136 (10): 713-722 http://www.ncbi.nlm.nih.gov/pubmed/12020139

Neck pain is a common problem, but the effectiveness of frequently applied conservative therapies has never been directly compared. In this study, manual therapy was a favorable treatment option for patients with neck pain compared with physical therapy or continued care by a general practitioner.

2004 - Cost Effectiveness of Physical Treatments for Back Pain in Primary Care British Medical Journal 2004 (Dec 11); 329 (7479): 1381 <u>http://www.bmj.com/content/329/7479/1381.full</u>

We believe that this is the first study of physical therapy for low back pain to show convincingly that both manipulation alone and manipulation followed by exercise provide cost effective additions to care in general practice. Indeed, as we trained practice teams in the best care of back pain, we may have underestimated the benefit of physical therapy (spinal manipulation) when compared with "usual care" in general practice. The detailed clinical outcomes reported in the accompanying paper reinforce these findings by showing that the improvements in health status reported here reflect statistically significant improvements in function, pain, disability, physical and mental aspects of quality of life, and beliefs about back pain.

2002 - Manual Therapy, Physical Therapy or Continued Care by a General Practitioner for Patients with Neck Pain.

Hoving J, Koes B, De Vet H, et al

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.

2001 - Patient Satisfaction with the Chiropractic Clinical Encounter Abstract #19986

Patient satisfaction with the chiropractic clinical encounter

Karen T. Boulanger, BA, Cheryl Hawk, DC, PhD, and Cynthia R. Long, PhD. Palmer Center for Chiropractic Research, 741 Brady Street, Davenport, IA 52803, 319-884-5160, Boulanger_k@palmer.edu

http://apha.confex.com/apha/129am/techprogram/paper_19986.htm

Data were collected from 2986 adult patients of 172 U.S. and Canadian chiropractors in a practice-based research program over a one-week period in November 1999. Of the 1822 patients reporting pain, 56.2% rated the care they received for it as "excellent," 30.6% "very good;" 9.3% "good;" 1.3% "fair;" and 0.2% "poor;" 2.0% did not respond. Patients were quite satisfied with the care they received with 83% reporting that their chiropractor always listened carefully to them and always explained things in a way they could understand; 88% reported their chiropractor always spont enough time with them.

2001 - 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.

2000 - 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. Nyiendo J, Haas M, Goodwin P.

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.

2000 - Economic Case for the Integration of Chiropractic Services into the Health Care System

J Manipulative Physiol Ther 2000 (Feb); 23 (2): 118–122

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.

B) Worker's Compensation (Post 2000)

The cost of 1989 workers' compensation low back pain claims. Spine (Phila Pa 1976). 1994 May 15;19(10):1111-5; discussion 1116. Webster BS, Snook SH.; Liberty Mutual Insurance Company, Hopkinton, MA. **RESULTS:**

Low back pain cases represented 16% of all claims but 33% of all claims costs; 55.4% of the low back pain cases received medical payments only (i.e., did not receive indemnity payments for lost time). The mean cost per case for low back pain was \$8321; median cost per case was \$396. Medical costs represented 32.4% of the total costs; indemnity costs (i.e., payment for lost time) represented 65.8%.

Historical Review

For the conditions treated most often by chiropractors, chiropractic services are more cost-effective than competing methods. Health policy that encourages effective and cost-effective methods leads to superior outcomes and lower costs.

"In the U.S., at least 200,000 microdiskectomies are performed annually at a direct cost of \$5 billion, or \$25,000 per procedure. Avoiding 60 percent of these surgeries [by sending the patients to chiropractors] would mean a reduction savings of \$3 billion annually. In the Canadian study, patients receiving chiropractic care averaged 21 visits during their course of care. If a cost of \$100 per patient visit is assumed for the care provided by the chiropractor, then the total cost per patient would be \$2,100, yielding per patient savings of \$22,900, or \$2.75 billion dollars annually." _{(Center for Health Value Innovation, 2010;} Outcomes-Based Contracting: The Value-Based Approach for Optimal Health with Chiropractic Services).

Given the sizable demand for spine care in the marketplace, it is increasingly important to improve delivery at both the systems and individual levels. Although consistent clinical guidelines are well established, patterns of practice with respect to treatment of lower back pain (LBP) vary widely, and are notoriously resistant to change. An additional hurdle is that patients often use questionable information (often from non-medical sources) to follow a treatment path that is contrary to evidence-based clinical practice guidelines.

Estimates suggest around 85-90% of primary care patients with LBP are diagnosed with non-specific back pain, where the underlying disease or pathology remains unknown. In the current environment, pain complaints are a leading reason for medical visits, and MSK issues rank as the top concern. Within this category, back pain is the most common ailment confronting individuals

A major downfall in many existing guidelines is they fail to identify the most appropriate health care provider at the outset of treatment. Instead, clinical guidelines are developed with a professional group e.g., primary care practitioners as the intended audience. As a result, clinical practice guidelines (CPG) are not well suited to inform decisions about who is the most appropriate initial health care provider. The concern with having patients first consult a general practitioner is a treatment strategy that may not be optimized for individual patients leading to inconsistent results if not iatrogenic disability.

This is important because not all patients entering a care pathway for spine-related disorders are the same. Data suggest that for first contact settings, around 55% of patients are at low risk of poor outcome and are likely to do well irrespective of treatment while 33% are at medium risk and 12% are at high-risk of poor outcome. Patients at medium risk of poor outcome are defined as experiencing pain-related physical limitations. Patients at high risk of poor outcome are experiencing physical challenges and are emotionally distressed by their back pain and social circumstances.

In a major study, performed in a capitated managed care system, and published in journal *Spine*, physical therapy was compared to chiropractic and was found to be significantly inferior both in outcomes measures and patient satisfaction". [1][2][3][4] More and more studies are supportive of the fact that the uncomplicated spine pain patient, inclusive of both pre- and post-surgical patients, be referred to an experienced chiropractor with special interest in functional restoration, who incorporates manipulative procedures concurrently with physical medicine modalities in addressing both spine and the myriad of muscle conditions. Outcomes are far superior, recidivism significantly diminished, and cost-effectiveness better than physical therapy alone; medicine alone or used concomitantly.

The peer-review editorialists suggest that orthopedic surgeons, in particular, together with other providers dealing in axial skeletal pain and rehabilitation to reconsider the indiscriminate referral of pre- and post-surgical pain patients to physical therapy with the naive expectation that most physical therapists "know" what to do with the spine pain patient or post-surgical pain patient. The scientific literature is clear that this is certainly not the case! [5]

References:

- [1] University of California Low Back Pain Study; Spine, 2002; 43:428-7
- [2] GF Kominski, et al, Medical Care, 2005; 43:425-7
- [3] T Carey, J Freburger, Medical Care, 2005, 43:428-35
- [4] E Hurwitz, et al, Spine, 2002; 43:428-7
- [5] JS Feine, JP Lund, Pain, 1997;71:5-23

PCPs Do Not Follow Established Guidelines

Most patients with low-back pain still consult their family physician. There are a variety of reasons – some chosen by patients, some forced upon them by the health care system. This is despite compelling evidence that most family physicians do not have expertise in the management of patients with back pain, do not follow evidence-based guidelines and treatment approaches that would produce best results, and that the management of these patients remains remarkably inefficient and expensive.

Health care systems, reacting to patient pressure and even more to the concerns of third party payers, are finally reacting and devising methods for improved spine care. The development of evidence-based clinical guidelines has been an important first step but has proved to be an inadequate response by itself. Most clinicians simply ignore them and follow their own belief systems despite education.[2]. This is why we now see the current development of multidisciplinary spine care pathways, which will assume a dominant role in the years ahead. Features of these include:

- Classification of patients into clinical sub-groups, using criteria and language common to all professionals engaged in spine care (e.g. MDs, chiropractors, PTs).
- Evidence-based management according to those sub-groups. Incentives and structures to support the use and efficient operation of these pathways.
- Built-in on-going measurement of results and research to sustain and support the pathways – not only assessing safety and effectiveness but with a new focus on cost-effectiveness and patient satisfaction and the value of care.
- Dramatic reductions in imaging, other expensive diagnostic testing and invasive treatments and surgery.

In other words, improved care is no longer reliant upon an individual clinician being willing to adopt guidelines, improve performance and be ready to refer to other spine care professionals as appropriate.

Improved care comes from a wider system of care.

If individual clinicians wish to have continued access to patients and to benefit from various financial and other incentives offered, they must support and adopt the dominant spine care pathway developed and accepted in their healthcare community.

2013 - Early predictors of lumbar spine surgery after occupational back injury: results from a prospective study of workers in Washington State.

Spine(Phila Pa 1976). 2013 May 15;38(11):953-64. Keeney BJ, Fulton-Kehoe D, Turner JA, Wickizer TM, <u>Chan KC</u>, Franklin GM.

Source

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Abstract

STUDY DESIGN: Prospective population-based cohort study.

OBJECTIVE: To identify early predictors of lumbar spine surgery within 3 years after occupational back injury.

SUMMARY OF BACKGROUND DATA: Back injuries are the most prevalent occupational injury in the United States. Few prospective studies have examined early predictors of spine surgery after work-related back injury.

METHODS: Using Disability Risk Identification Study Cohort (D-RISC) data, we examined the early predictors of lumbar spine surgery within 3 years among Washington State workers, with new workers compensation temporary total disability claims for back injuries. Baseline measures included worker-reported measures obtained approximately 3 weeks after claim submission. We used medical bill data to determine whether participants underwent surgery, covered by the claim, within 3 years. Baseline predictors (P < 0.10) of surgery in bivariate analyses were included in a multivariate logistic regression model predicting lumbar spine surgery. The area under the receiver operating characteristic curve of the model was used to determine the model's ability to identify correctly workers who underwent surgery.

RESULTS: In the D-RISC sample of 1885 workers, 174 (9.2%) had a lumbar spine surgery within 3 years. Baseline variables associated with surgery (P < 0.05) in the multivariate model included higher Roland-Morris Disability Questionnaire scores, greater injury severity, and surgeon as first provider seen for the injury. Reduced odds of surgery were observed for those younger than 35 years, females, Hispanics, and those whose first provider was a chiropractor. Approximately 42.7% of workers who first saw a surgeon had surgery, in contrast to only 1.5% of those who saw a chiropractor. The area under the receiver operating characteristic curve of the multivariate model was 0.93 (95% confidence interval, 0.92-0.95), indicating excellent ability to discriminate between workers who would versus would not have surgery.

CONCLUSION: Baseline variables in multiple domains predicted lumbar spine surgery. There was a very strong association between surgery and first provider seen for the injury even after adjustment for other important variables.

COMMENT: The results of this new study further documents chiropractic care as a first option for back pain relief and surgical avoidance. The study concluded there were reduced odds of surgery for those under age 35, women, Hispanics and those whose first provider was a chiropractor. In total, 42.7 percent of workers who initially visited a surgeon underwent surgery, in contrast to only 1.5 percent of those who first consulted a chiropractor. This important study was conducted by a collaboration of prestigious institutions, including Geisel School of Medicine at Dartmouth College, University of Washington School of Public Health, University of Washington School of Medicine, Ohio State University College of Public Health and the Washington State Department of Labor and Industries. Back injuries are the most prevalent occupational injury in the U.S., and care is commonly associated with one of the most costly treatments – spine surgery. Chiropractic is clearly the most appropriate first treatment option for patients with back pain, and this study confirms the value.

2011 - Health maintenance care in work-related low back pain and its association with disability recurrence.

Cifuentes M, Willetts J, Wasiak R.

J Occup Environ Med. 2011 Apr;53(4):396-404.

Source

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Abstract

OBJECTIVES: To compare occurrence of repeated disability episodes across types of health care providers who treat claimants with new episodes of work-related low back pain (LBP).

METHOD: A total of 894 cases followed 1 year using workers' compensation claims data. Provider types were defined for the initial episode of disability and subsequent episode of health maintenance care.

RESULTS: Controlling for demographics and severity, the hazard ratio [HR] of disability recurrence for patients of physical therapists (HR = 2.0; 95% confidence interval [CI] = 1.0 to 3.9) or physicians (HR = 1.6; 95% CI = 0.9 to 6.2) was higher than that of chiropractor (referent, HR = 1.0), which was similar to that of the patients non-treated after return to work (HR = 1.2; 95% CI = 0.4 to 3.8). **CONCLUSIONS:** In work-related nonspecific LBP, the use of health maintenance care provided by physical therapist or physician services was associated with a higher disability recurrence than in chiropractic services or no treatment.

2003 - Manual Therapy and Exercise Therapy in Patients with Chronic Low Back Pain.

Aure O, Nilsen J, Vasseljen O. 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.

2003 - 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.

2003 - Chiropractic Treatment of Workers' Compensation Claimants in the State of Texas, 2003

MGT of America (National research/consulting)

This retrospective study of workers' compensation claims from 1996 to 2001 was conducted by an independent, national research and consulting firm 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 costeffective compared to medical treatment. They found that chiropractor treatment costs were the lowest of all providers and that chiropractic care was associated with significantly lower costs and more rapid recovery in treating workers with low-back injuries. The study data demonstrated that increased utilization of chiropractic care could lead to declining costs relative to lower back injuries.

Cost of care for common back pain conditions initiated with chiropractic doctor vs. medical doctor/doctor of osteopathy as first physician experience of one Tennesseebased general health insurer.

Similar findings can be found in a two-year retrospective claims analysis of Blue Cross Blue Shield-Tennessee members. It found that "Paid costs for episodes of care initiated with a doctor of chiropractic medicine (DC) were almost 40% less than episodes initiated with a medical doctor (MD). Even after risk adjusting each patient's costs, we found that episodes of care initiated with a DC were 20% less expensive than episodes initiated with an MD."

Insurers are beginning to take steps to empower consumers with better information and make it easier for the medical community to direct care in the most appropriate and cost-effective manner. Upgrading the diagnostic triage process is a crucial step in better managing costs and improving outcomes.

Findings of the UK BEAM Trial, published in the British Medical Journal in 2004 concluded:

"Manipulation, with or without exercise, improved symptoms more than best care (medical care) alone after three and 12 months. However, analysis of the cost utility of different strategies shows that manipulation alone probably gives better value for money than manipulation followed by exercise" (page 1381).

A new retrospective analysis of 70,274 member-months in a 7-year period within an IPA, comparing medical management to chiropractic management, demonstrated decreases of 60.2% in-hospital admissions, 59.0% hospital days, 62.0% outpatient surgeries and procedures, and 83% pharmaceutical costs when compared with conventional medicine IPA performance. This clearly demonstrates that chiropractic nonsurgical nonpharmaceutical approaches generates reductions in both clinical and cost utilization when compared with PCPs using conventional medicine alone.

Paid costs for episodes of care initiated with a DC were almost 40% less than episodes initiated with an MD. Even after risk adjusting each patient's costs, we found that episodes of care initiated with a DC were 20% less expensive than episodes initiated with an MD. This clearly demonstrates the savings that are possible when a patient is permitted to choose a chiropractor, rather than an MD for their care. This study found that a patient was twice as likely to end up disabled if treated by a Physical Therapist, rather than receiving treatment from a chiropractor, and that patients were 60% more likely to be disabled if they choose an MD to manage their care, rather than a chiropractor.

A health care facility (Jordan Hospital) implemented a multidimensional spine care pathway (SCP) using the National Center for Quality Assurance (NCQA) Back Pain Recognition Program (BPRP) as its foundation. The findings for 518 consecutive patients were included. One hundred sixteen patients were seen once and triaged to specialty care; 7% of patients received magnetic resonance imagings. Four hundred thirty-two patients (83%) were classified and treated by doctors of chiropractic and/or physical therapists. Results for the patients treated by doctors of chiropractic were mean of 5.2 visits, mean cost per case of \$302, mean intake pain rating score of 6.2 of 10, and mean discharge score of 1.9 of 10; 95% of patients rated their care as "excellent [7].

2003 - Conservative Spine Care: The State of the Marketplace and Opportunities for Improvement 2003

OptumHealth White Paper

Data from OptumHealth (United Health Care) indicate that a more efficient treatment path typically begins with a patient consulting a chiropractor - not a PCP, Orthopedic Surgeon or Physical therapist, but a chiropractor! The literature supports the fact that this path tends to lead to interventions that are more closely aligned with recommended treatment guidelines and ultimately result in more favorable solutions at more reasonable costs. [1]

Efficacy of Preventive Spinal Manipulation for Chronic Low Back Pain and Related Disabilities: A Preliminary Study.

Descarreaux M, Blouin J, Drolet M, Papadimitriou S, Teasdale N. 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.

2004 - Efficacy of Spinal Manipulation and Mobilization for Low Back Pain and Neck Pain: A Systematic Review and Best Evidence

Synthesis.

Bronfort G, Haas M, Evans R, Bouter L. 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.

2005 - Cost-effectiveness of Medical and Chiropractic Care for Acute and Chronic Low Back Pain

J Manipulative Physiol Ther 2005 (Oct);28 (8):555–563

Acute and chronic chiropractic patients experienced better outcomes in pain, functional disability, and patient satisfaction. Chiropractic care appeared relatively cost-effective for the treatment of chronic LBP. Chiropractic and medical care performed comparably for acute patients. Practice-based clinical outcomes were consistent with systematic reviews of spinal manipulation efficacy: manipulationbased therapy is at least as good as and, in some cases, better than other therapeusis. This evidence can guide physicians, payers, and policy makers in evaluating chiropractic as a treatment option for low back pain.

2005 - Effects of a Managed Chiropractic Benefit on the Use of Specific Diagnostic and Therapeutic Procedures in the Treatment of Low Back and Neck Pain

J Manipulative Physiol Ther 2005 (Oct); 28 (8): 564–569 For the treatment of low back and neck pain, the inclusion of a chiropractic benefit resulted in a reduction in the rates of surgery, advanced imaging, inpatient care, and plain-film radiographs . This effect was greater on a perepisode basis than on a per-patient basis.

2006 - 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.

Santilli V, Beghi E, Finucci S.

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.

2006 - A non-surgical approach to the management of lumbar spinal stenosis: a prospective observational cohort study.

Murphy DR, Hurwitz EL, Gregory AA, Clary R.

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 reevaluated 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.

2006 - Does the evidence for spinal manipulation translate into better outcomes in routine clinical care for patients with occupational low back pain?

Fritz JM, Brennan GP, Leaman H 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.

2007 - Diagnosis and Treatment of Low Back Pain: Recommendations from the American College of Physicians/American Pain Society.

V. Snow, D. Casey, J.T. Cross Jr., P. Shekelle, and D.K. Owens Annals of Internal Medicine (volume 147, pages 478-491, 492-504, and 505-514).

Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society; 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 (The Clinical Efficacy Assessment Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel)

Summary:

When diagnosing musculoskeletal low back pain, doctors need to rule out these serious causes. However, it is not clear that x-rays, computed tomography (CT) (or "CAT scans"), magnetic resonance imaging (MRI), or other tests are necessary in most cases.

The main goal in treating low back pain is to decrease the pain and allow patients to resume their normal activities. Treatment options for low back pain include (painkillers, anti-inflammatory drugs, and muscle relaxants), with concurrent nondrug treatments for patients who do not respond to self-care: rehabilitation, spinal manipulation, exercise therapy, massage, acupuncture, yoga, progressive relaxation, or cognitive-behavioral therapy.

2007 - Clinical Utilization and Cost Outcomes from an Integrative Medicine Independent Physician Association: An Additional 3-year Update

J Manipulative Physiol Ther 2007 (May); 30 (4): 263–269 A new retrospective analysis of 70,274 member-months in a 7-year period within an IPA, comparing medical management to chiropractic management, demonstrated decreases of 60.2% in-hospital admissions, 59.0% hospital days, 62.0% outpatient surgeries and procedures, and 83% pharmaceutical costs when compared with conventional medicine IPA

performance. This clearly demonstrates that chiropractic nonsurgical nonpharmaceutical approaches generates reductions in both clinical and cost utilization when compared with PCPs using conventional medicine alone.

2007 - Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. Vernon H, Humphreys K, Hagino C.

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.

2009 - Functional Scores and Subjective Responses of Injured Workers With Back or Neck Pain Treated With Chiropractic Care in an Integrative Program: A Retrospective Analysis of 100 Cases

J Manipulative Physiol Ther. 2009 (Nov); 32 (9): 765-771

Injured workers with either an acute or subacute injury had significantly lower posttreatment FRI scores compared with individuals with a chronic injury. The FRI change scores were significantly greater in the acute group compared with either the subacute or chronic injured workers. Workers in all categories showed improved post-treatment tolerance for work-related activities and significantly lower posttreatment subjective pain scores. The study identified positive effects of chiropractic management included in integrative care when treating work-related neck or back pain. Improvement in both functional scores and subjective response was noted in all 3 time-based phases of patient status (acute, subacute, and chronic).

2009 - Do Chiropractic Physician Services for Treatment of Low-Back and Neck Pain Improve the Value of Health Benefit Plans? Mercer Health and Benefits LLC ~ October 12, 2009

This report combined a rigorous analysis of direct and indirect costs with equally relevant (though often missing from such analyses) evidence concerning clinical effectiveness. In other words, Choudhry and Milstein started with the assumption that low cost is only a virtue if a product or service effectively delivers what it promises. Including both clinical effectiveness and cost in their analysis, they concluded that chiropractic care was far more valuable than medical treatment for neck and low back pain.

2009 - Functional Scores and Subjective Responses of Injured Workers With Back or Neck Pain Treated With Chiropractic Care in an Integrative Program: A Retrospective Analysis of 100 Cases

J Manipulative Physiol Ther. 2009 (Nov); 32 (9): 765–771 D Aspegren, DC, MS, et al

Department of Rehabilitation, University of Colorado School of Medicine, Lakewood, CO

OBJECTIVE: The purpose of this study is to report on integrative care for the treatment of injured workers with neck or back pain referred to a doctor of chiropractic from a medical or osteopathic provider.

METHODS: This retrospective case series study evaluated data on 100 patients referred for chiropractic care of work-related spinal injuries involving workers' compensation claims.

Deidentified data included age, sex, visual analog scale scores for pain, pre- and posttreatment Functional Rating Index (FRI) scores, and subjective response to chiropractic care. Based on date of injury to first chiropractic treatment, patients were subdivided as acute, subacute, or chronic injured workers. Cases were analyzed for differences in pretreatment FRI scores, posttreatment FRI scores, FRI change scores (posttreatment FRI minus pretreatment FRI score and subjective percentage improvement using a 1-way analysis of variance. Treatment include manual therapy techniques and exercise.

RESULTS: Injured workers with either an acute or subacute injury had significantly lower posttreatment FRI scores compared with individuals with a chronic injury. The FRI change score were significantly greater in the acute group compared with either the subacute or chronic injured workers. Workers in all categories showed improved posttreatment tolerance for work-related activities and significantly lower posttreatment subjective pain scores.

CONCLUSIONS: The study identified positive effects of chiropractic management included in integrative care when treating work-related neck or back pain. Improvement in both functional scores and subjective response was noted in all 3 time-based phases of patient status (acute, subacute, and chronic).

2010 - LIBERTY MUTUAL RESEARCH INSTITUTE FOR SAFETY ANNUAL REPORT OF SCIENTIFIC ACTIVITIES 2010

Liberty Mutual INSURANCE is an industry leader in occupational health and safety, managed care, occupational rehabilitation and return-to-work programs. Additionally, Liberty Mutual is the only insurer to operate its own Research Center for Safety and Health as well as a Medical Service Center that specializes in rehabilitation programs. Liberty International Underwriters has full access to all of Liberty Mutual's facilities and market strengths.

Center for Disability Research (Excerpted)

The Center for Disability Research (CDR) conducts research on reducing occupational disability and promoting safe and sustained return to work. CDR scientists examine factors associated with work absence, re-injury, and post-injury job retention, and they investigate the impact of employer responses and accommodations, clinical treatments, case management, and other interventions.

Our findings help physicians, case managers, and employers better understand the disability process, improve return-to-work outcomes, and ultimately, enhance the quality of life for workers.

During 2010, CDR researchers pursued several studies based on surveys, clinical encounters, and administrative data. CDR completed a study that showed the potential harmful effects of early Magnetic Resonance Imaging for low-back-injured workers. Novel analytic strategies were used to develop new insights about the relationship between certain patterns of care or workplace-related interventions and various outcomes. Further, CDR continued their efforts to identify successful nonmedical interventions, such as low back pain self-management strategies and supervisor assessment protocols for achieving sustained return to work. We were honored to help organize the First Scientific Conference on Work Disability Prevention and Integration.

This landmark conference, held in Angers, France, was the first to focus exclusively on work disability prevention research and the promotion of safe and sustained return to work.

Summary Conclusions

Researchers found that the patients who had received passive physical therapy services had a significantly greater number of disability days than those who received no therapy

Study participants who received comprehensive ergonomics training reported significantly fewer musculoskeletal symptoms of pain/discomfort than those who received minimal training.

...cases that had early MRIs were more likely to have prolonged disability, higher medical costs, and greater utilization of surgery. At one year, 90% of subjects in the intervention groups were working, compared

with 68% in the control group. Similarly, the improvements in pain...were greater in both intervention groups.

...patients treated by physical therapists or physicians have a higher rate of recurrence than those treated by chiropractors....

Effectiveness of Low Back Pain Health Maintenance Treatment Strategies

In the occupational health field, sustained return-to-work is considered an important milestone in the injury recovery process. Depending on a patient's condition and circumstances, if low back pain recurs and requires the patient to stop working again, this is considered a failure of the return-to-work process. However, little research has examined the associations between various health maintenance treatment strategies (defined as care received after returning to work) and low back pain recurrence. A significant association between a specific type of clinical treatment and fewer disability recurrences could represent an important advancement in the treatment of work-related back injuries.

Therefore, CDR conducted a study comparing recurrence outcomes for health maintenance care delivered by three types of providers: chiropractors, physical therapists, and physicians. Using workers compensation claims data, researchers examined treatment patterns for a cohort of 894 new-episode low back pain cases occurring over the course of one year (January 1 to December 31, 2006). The goal was to compare repeated disability episodes across patients under the care of physical therapists, physicians, and chiropractors as well as patients who received no treatment after returning to work for more than 14 days Providers were defined as those who provided the initial treatment as well as subsequent health maintenance care.

Disability Re	ecurrence
Type of care	Hazard Ratio
Physical therapists	2.0
Physicians	1.6
No treatment	1.2
Chiropractors	<mark>1.0</mark>

Controlling for demographics and severity, the hazard ratio (HR) of disability recurrence for patients of physical therapists (HR = 2.0) and physicians (HR = 1.6)

was higher than for non-treated patients (HR = 1.2) or chiropractic patients (HR = 1.0).

These findings suggest that patients who receive health maintenance care services from physical therapists or physicians <u>may have a higher rate of work-related non-</u><u>specific low back pain disability recurrence than those treated by chiropractors</u> or those who receive no health maintenance treatment. It should be noted that these results do not support any of these health maintenance strategies in preventing recurrence. Further research is needed to verify these preliminary findings.

Collaborations

Harvard School of Public Health, University of Massachusetts–Lowell The Research Institute partners with premier research organizations to enhance its mission of advancing scientific, business relevant knowledge in workplace and highway safety and work disability.

The strategic partnerships produced many accomplishments in 2010, including several joint research studies involving postdoctoral fellows from the Harvard School of Public Health (HSPH) and the University of Massachusetts– Lowell (UML), a special issue of *Accident Analysis and Prevention* that resulted from our Fatigue and Safety Hopkinton Conference, and a lead role in organizing the First Scientific Conference on Work Disability Prevention and Integration. For 17 years, the Liberty Mutual-HSPH Program in Occupational Safety and Health has provided opportunities for collaborative research in areas of mutual interest.

The Center for Disability Research at the Liberty Mutual Research Institute for Safety and the University of Massachusetts Lowell, Hopkinton, Mass; and the Center for Health Economics & Science Policy at United BioSource Corporation, London, United Kingdom.

This study is unique in that their objective was to compare the occurrences of repeated disability episodes between types of health care providers, who treat claimants with new episodes of work-related low back pain (LBP). They followed 894 patients over 1-year, using workers' compensation claims data.

By controlling for demographics and severity, they determined the hazard ratio (HR) for disability recurrence between 3 types of providers: Physical Therapists (PT), Physicians (MD), or Chiropractors (DC).

The results are most interesting:

For PTs	: Hazard Ratio	= 2.0
For MDs	: Hazard Ratio	= 1.6
For DCs	: Hazard Ratio	= 1.0

Statistically, this means a patient is twice as likely to end up disabled if the patient was treated by a Physical Therapist (PT), rather than by a chiropractor. Interestingly, a patient was 60% more likely to be disabled if the patient chose a Physician (MD) to manage their care, rather than a chiropractor. The authors concluded: "In work-related nonspecific LBP, the use of health maintenance care provided by physical therapist or physician services was associated with a higher disability recurrence than with chiropractic services." [8]

There has been conflicting research and an ongoing debate regarding the cost-value of chiropractic. At the center of the debate is the question: Does chiropractic add to or reduce the total cost of care? The most recent and better designed studies suggest that chiropractic care can not only reduce the immediate cost of an episode of care, but reduce the recurrence of subsequent bouts of conditions such as low back pain. These musculoskeletal conditions are a heavy financial burden on society often requiring expensive tests to pinpoint the exact diagnosis.

• 2013 - Randomized Trial Adding Chiropractic Manipulative Therapy to Standard Medical Care for Patients With Acute Low Back Pain: Results of a Pragmatic Randomized Comparative Effectiveness Study; Spine: 2013

A study designed to assess changes in pain levels and physical functioning in response to standard medical care (SMC) versus SMC plus chiropractic manipulative therapy (CMT) for the treatment of low back pain (LBP) among 18 to 35-year-old active-duty military personnel, it was concluded that CMT in conjunction with SMC offers a significant advantage for decreasing pain and improving physical functioning when compared with only standard care, for men and women between 18 and 35 years of age with acute LBP.[13]

- 2012 Value of Chiropractic Services at an On-site Health Center; J Occupational and Environmental Med 2012 (Aug);54 (8):917–921This study, offering on-site chiropractic care, versus off-site physical therapy, concluded that "[These results suggest that] chiropractic services offered at on-site health centers may promote lower utilization of certain health care services, while improving musculoskeletal function." Additionally, patients who receive chiropractic treatment often have a more conservative, less invasive treatment profile which can significantly reduce the overall cost of treatment.
- 2011 Does maintained Spinal manipulation therapy for chronic non-specific low back pain result in better long term outcome? Senna MK, Machaly SA; Spine (Phila Pa 1976). 2011
 Does maintained Spinal manipulation therapy for chronic non-specific low back pain result in better long term outcome? A study carried out at the Rheumatology & Rehabilitation Department at the University of Mansoura, Egypt, and published in journal *Spine* demonstrated that spinal manipulation therapy is an effective modality in chronic non-specific LBP for short-term effects. Application of spinal manipulation therapy yielded better results when compared with the sham manipulation. Conclusions suggested that maintained spinal manipulation is beneficial to patients of chronic nonspecific LBP particularly to those who gain improvement after initial intensive manipulation to maintain the improved post-treatment pain and disability levels [12].
- 2009 Consumer Reports Lists Chiropractic Patients As Most Satisfied; Consumer Reports ~ May 2009 A study in the May 2009 issue of Consumer Reports shows that hands-on therapies were tops among treatments for relief of back pain. The study, which surveyed more than 14,000 consumers, was conducted by the Consumer Reports Health Ratings Center. The report states that, "eightyeight percent of those who tried chiropractic manipulation said it helped a lot, and 59 percent were 'completely' or 'very' satisfied with their chiropractor."[11]

• 2006 - 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

In a study published in journal *Spine*, designed to assess the short- and longterm effects of spinal manipulations on acute back pain and sciatica with disc protrusion a cohort of 102 ambulatory patients with at least moderate pain and/or radiating pain were evaluated. Active manipulations had more effect than simulated manipulations on pain relief for acute back pain and sciatica with disc protrusion [15].

• 2006 - Chiropractic Services in the Canadian Armed Forces: A Pilot Project; Military Medicine 2006

A study reports on satisfaction associated with the introduction of chiropractic services within a military hospital, through a Canadian Armed Forces Pilot Project. We distributed a 27-item survey that inquired about demographic information and satisfaction with chiropractic services to 102 military personnel presenting for on-site chiropractic services at the Archie McCallum Hospital in Halifax, Nova Scotia. The majority of military personnel (94.2%) and referring physicians (80.0%) expressed satisfaction with chiropractic services [10]

• 2003 - Chronic spinal pain - a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine 2003

A randomized, controlled clinical trial published in the journal *Spine* reveals that chiropractic manipulation (adjustment) is superior to both drugs and acupuncture in the treatment of chronic spinal pain (people with pain lasting more than 13 weeks). The study, conducted at a multidisciplinary spinal pain outpatient unit in an Australian public hospital, involved 115 patients randomly assigned to receive one of three interventions: medication, needle acupuncture or chiropractic manipulation. One of the study's most remarkable findings was that patients in the manipulation group reported a 47 percent improvement on a general overall health questionnaire, compared to only 15 percent for the acupuncture group and 18 percent for the medication group [14].

References:

- [1] Chiropractic Treatment of Workers' Compensation Claimants in the State of Texas, 2003, MGT of America
- [2] Liliedahl RL, Finch MD, Cost of care for common back pain conditions initiated with chiropractic doctor vs. medical doctor/doctor of osteopathy as first physician experience of one Tennessee-based general health insurer. Journal of Manipulative and Physiological Therapeutics 2010; 33:1-4
- [3] Findings from the: "United Kingdom Back Pain Exercise and Manipulation (UK BEAM) Randomised Trial", British Medical Journal 2004 (Dec 11); 329 (7479):1377
- [4] Clinical Utilization and Cost Outcomes from an Integrative Medicine Independent Physician Association: An Additional 3-year Update; J Manipulative Physiol Ther 2007 (May); 30 (4): 263–269 http://www.ncbi.nlm.nih.gov/pubmed/17509435
- [5] Cost of Care for Common Back Pain Conditions Initiated With Chiropractic Doctor vs Medical Doctor/Doctor of Osteopathy as First Physician: Experience of One Tennessee-Based General Health InsurerJ Manipulative Physiol Ther 2010 (Nov); 33 (9): 640–643 <u>http://www.jmptonline.org/article/S0161-4754%2810%2900216-2/abstract</u>
- [6] Health Maintenance Care in Work-Related Low Back Pain and its Association with Disability Recurrence; Journal of Occupational and Environmental Medicine 2011 (Apr); 53 (4):396–404; http://www.ncbi.nlm.nih.gov/pubmed/21407100
- [7] A Hospital-Based Standardized Spine Care Pathway:Report of a Multidisciplinary, Evidence-Based Process J Manipulative Physiol Ther 2011 (Feb); 34 (2): 98–106 http://www.ncbi.nlm.nih.gov/pubmed/21334541
- [8] Health Maintenance Care in Work-Related Low Back Pain and Its Association With Disability Recurrence Journal of Occupational and Environmental Medicine 2011 (Apr); 53 (4):396–404 ~ Willetts J, Wasiak R.

- [9] Value of Chiropractic Services at an On-site Health Center; J Occupational and Environmental Med 2012 (Aug);54 (8):917–921 ~Curt A. Krause, DC; Lisa Kaspin, PhD; Kathleen M. Gorman, MPH; Ross M. Miller, MD, MPH
- [10] Chiropractic Services in the Canadian Armed Forces: A Pilot Project; Military Medicine 2006 (Jun); 171 (6): 572–576 <u>http://www.ncbi.nlm.nih.gov/pubmed/16808144?dopt=AbstractPlus</u>
- [11] Consumer Reports Lists Chiropractic Patients As Most Satisfied; Consumer Reports ~ May 2009 http://www.consumerreports.org/cro/magazine-archive/may-2009/health/back-pain/overview/back-pain-ov.htm
- [12] Does maintained Spinal manipulation therapy for chronic non-specific low back pain result in better long term outcome? Senna MK, Machaly SA; Spine (Phila Pa 1976). 2011 Jan 17. [Epub ahead of print]; Source: Rheumatology and Rehabilitation Department, Mansoura Faculty of Medicine, Mansoura University
- [13] Randomized Trial Adding Chiropractic Manipulative Therapy to Standard Medical Care for Patients With Acute Low Back Pain: Results of a Pragmatic Randomized Comparative Effectiveness Study; Spine: 15 April 2013 -Volume 38 - Issue 8 - p 627–634; Goertz, et al.
- [14] Chronic spinal pain a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine 2003;28:1490-1503.Giles LGF, Muller R.
- [15] 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. Epub 2006 Feb 3.Santilli V, Beghi E, Finucci S.Source Direttore Cattedra Medicina Fisica e Riabilitativa, Università di Roma La Sapienza, P.le Aldo Moro 5, Roma, Rome, 00185, Italy.

2011 - Long-term Outcomes of Lumbar Fusion among Workers' Compensation Subjects: An Historical Cohort Study

SPINE (Phila Pa 1976) 2011 (Feb 15);36 (4):320-331

Nguyen TH, Randolph DC, Talmage J, Succop P, Travis R. http://journals.lww.com/spinejournal/Abstract/2011/02150/Maggot_Debridement_Therapy_for_Postsurgical_Wound.8.aspx

From the Division of Epidemiology and Biostatistics, Department of Environmental Health, University of Cincinnati College of Medicine, Milford, OH; Meharry Medical College, Nashville, TN; and Department of Physical Medicine and Rehabilitation, University of Kentucky College of Medicine, Lexington, KY. Commentary from an MSNBC.com article titled: "Back Surgery May Backfire on Patients in Pain"

Experts estimate that nearly 600,000 Americans opt for back operations each year. But for many like Scatena, surgery is just an empty promise, say pain management experts and some surgeons. A new study in the journal Spine shows that in many cases surgery can even backfire, leaving patients in more pain.

Researchers reviewed records from 1,450 patients in the Ohio Bureau of Workers' Compensation database who had diagnoses of disc degeneration, disc herniation or radiculopathy, a nerve condition that causes tingling and weakness of the limbs. Half of the patients had surgery to fuse two or more vertebrae in hopes of curing low back pain. The other half had no surgery, even though they had comparable diagnoses.

After two years, just 26 percent of those who had surgery returned to work. That's compared to 67 percent of patients who didn't have surgery. In what might be the most troubling study finding, researchers determined that there was a 41 percent increase in the use of painkillers, specifically opiates, in those who had surgery.

The study provides clear evidence that for many patients, fusion surgeries designed to alleviate pain from degenerating discs don't work, says the study's lead author Dr. Trang Nguyen, a researcher at the University of Cincinnati College of Medicine.

Unfortunately, for most patients with bad backs, there is no easy solution, no magic bullet. Pain management experts — and some surgeons — say that patients need to scale back their expectations. With the right treatments, pain can be eased, but a complete cure is unlikely.

27 million adults with back problems

A recent report by the Agency for Healthcare Research and Quality, a federal organization, found that in 2007, 27 million adults reported back problems with \$30.3 billion spent on treatments to ease the pain. While some of that money is spent on physical therapy, pain management, chiropractor visits, and other non invasive therapies, the biggest chunk pays for spine surgeries.

Abstract:

STUDY DESIGN: Historical cohort study.

OBJECTIVE: To determine objective outcomes of return to work (RTW), permanent disability, postsurgical complications, opiate utilization, and reoperation status for chronic low back pain subjects with lumbar fusion. Similarly, RTW status, permanent disability, and opiate utilization were also measured for nonsurgical controls.

SUMMARY OF BACKGROUND DATA: A historical cohort study of workers' compensation (WC) subjects with lumbar arthrodesis and randomly selected controls to evaluate multiple objective outcomes has not been previously published. METHODS: A total of 725 lumbar fusion cases were compared to 725 controls who were randomly selected from a pool of WC subjects with chronic low back pain diagnoses with dates of injury between January 1, 1999 and December 31, 2001. The study ended on January 31, 2006. Main outcomes were reported as RTW status 2 years after the date of injury (for controls) or 2 years after date of surgery (for cases). Disability, reoperations, complications, opioid usage, and deaths were also determined.

RESULTS: Two years after fusion surgery, 26% (n = 188) of fusion cases had RTW, while 67% (n = 483) of nonsurgical controls had RTW (P = 0.001) within 2 years from the date of injury. The reoperation rate was 27% (n = 194) for surgical patients. Of the lumbar fusion subjects, 36% (n = 264) had complications. Permanent disability rates were 11% (n = 82) for cases and 2% (n = 11) for nonoperative controls (P= 0.001). Seventeen surgical patients and 11 controls died by the end of the study (P = 0.26). For lumbar fusion subjects, daily opioid use increased 41% after surgery, with 76% (n = 550) of cases continuing opioid use after surgery. Total number of days off work was more prolonged for cases compared to controls, 1140 and 316 days, respectively (P < 0.001). Final multivariate, logistic regression analysis indicated the number of days off before surgery odds ratio [OR], 0.94 (95% confidence interval [CI], 0.92-0.97); legal representation OR, 3.43 (95% CI, 1.58-7.41); daily morphine usage OR, 0.83 (95% CI, 0.71-0.98); reoperation OR, 0.42 (95% CI, 0.26-0.69); and complications OR, 0.25 (95% CI, 0.07-0.90), are significant predictors of RTW for lumbar fusion patients.

CONCLUSIONS: This Lumbar fusion for the diagnoses of disc degeneration, disc herniation, and/or radiculopathy in a WC setting is associated with significant increase in disability, opiate use, prolonged work loss, and poor RTW status.

2013 - Spinal High-velocity Low Amplitude Manipulation in Acute Nonspecific Low Back Pain: A Double-blinded Randomized Controlled Trial in Comparison With Diclofenac and Placebo

Spine 2013 (Apr 1); 38 (7):540-548

A total of 101 patients with acute LBP (for <48 hr) were recruited from 5 outpatient practices, exclusion criteria were numerous and strict. Outcomes registered by a second and blinded investigator included self-rated physical disability, function (SF-12), off-work time, and rescue medication between baseline and 12 weeks after randomization. In a subgroup of patients with acute nonspecific LBP, spinal manipulation was significantly better than nonsteroidal anti-inflammatory drug diclofenac and clinically superior to placebo.

2012 - Early Predictors of Lumbar Spine Surgery after Occupational Back Injury: Results from a Prospective Study of Workers in Washington State. Keeney BJ, et al

Spine (Phila Pa 1976). 2012 Dec 12. [Epub ahead of print]

Source

From the Department of #Orthopaedics, Geisel School of Medicine at Dartmouth College the Department of †Environmental and Occupational Health Sciences,

University of Washington School of Public Health the Department of Psychiatry and Behavioral Sciences, University of Washington School of Medicine the Department of Rehabilitation Medicine, University of Washington School of Medicine the Department of Division of Health Services Management and Policy, Ohio State University College of Public Health Biostatistics, University of Washington School of Public Health the Department of Health Services, University of Washington School of Public Health the Department of Health Services, University of Washington School of Public Health the Labor and Industries, Olympia, WA.

Abstract

Study Design. Prospective population-based cohort study

Objective To identify early predictors of lumbar spine surgery within 3 years after occupational back injurySummary of Background Data. Back injuries are the most prevalent occupational injury in the United States. Few prospective studies have examined early predictors of spine surgery after work-related back injury

Methods Using Disability Risk Identification Study Cohort (D-RISC) data, we examined the early predictors of lumbar spine surgery within 3 years among Washington State workers with new worker's compensation temporary total disability claims for back injuries. Baseline measures included worker-reported measures obtained approximately 3 weeks after claim submission. We used medical bill data to determine whether participants underwent surgery, covered by the claim, within 3 years. Baseline predictors (P < 0.10) of surgery in bivariate analyses were included in a multivariate logistic regression model predicting lumbar spine surgery. The model's area under the receiver operating characteristic curve (AUC) was used to determine the model's ability to identify correctly workers who underwent surgery.

Results In the D-RISC sample of 1,885 workers, 174 (9.2%) had a lumbar spine surgery within 3 years. Baseline variables associated with surgery (P < 0.05) in the multivariate model included higher Roland Disability Questionnaire scores, greater injury severity, and surgeon as first provider seen for the injury. Reduced odds of surgery were observed for those under age 35, women, Hispanics, and those whose first provider was a chiropractor. 42.7% of workers who first saw a surgeon had

surgery, in contrast to only 1.5% of those who saw a chiropractor. The multivariate model's AUC was 0.93 (95% CI 0.92-0.95), indicating excellent ability to discriminate between workers who would versus would not have surgery. **Conclusion** Baseline variables in multiple domains predicted lumbar spine surgery. There was a very strong association between surgery and first provider seen for the injury, even after adjustment for other important variables.

C) Safety of Chiropractic

Historical Review

In the early 1960's, the American Medical Association (AMA) decided to try to contain and eliminate Chiropractic as a profession. The AMA's purpose was to prevent medical physicians from referring patients to Chiropractors, as well as preventing them from accepting referrals from Chiropractors; to prevent Chiropractors from obtaining access to hospital diagnostic and radiology services; to prevent medical physicians from teaching at chiropractic colleges, or engaging in any joint research; and, to stifle any other form of cooperation between the two professions. The AMA also told its membership, medical students, insurance companies, and the general public that Chiropractic was an "unscientific cult".

In 1976, five Chiropractors filed a lawsuit against the AMA (and other named entities) for violation of the Sherman Anti-trust Laws. After 15 years of litigation, the U.S. Court of Appeals stated that the AMA intended to "destroy a competitor," and that there was evidence "showing that the AMA was motivated by economic concerns". The court found that the AMA had concealed evidence showing its guilt, and was caught "doctoring" documents. The AMA was also "guilty of systematic, long term wrong doing and has not acknowledged its lawlessness".

Following the Court enforced reversal of AMA's policy, tiny splinter groups formed, with the intention of labeling chiropractic as a quackish cult. Their methods mimicked the earlier AMA suppression tactics: Create doubt about the quality of chiropractic education, and mislead the public into believing that chiropractic claims ALL disease is caused by subluxations. Although these groups hide behind the noble claim that they wish to protect the public from unscientific practices, their true motives are transparent. Their sole intention is to suggest that only allopathic medicine is well supported by scientific research, which is hardly true!

In an editorial in the highly esteemed *British Medical Journal*, titled "*Where is the Wisdom? The Poverty of Medical Evidence*", BMJ's editor Dr. Richard Smith recounts a lecture he attended with renowned health policy consultant Dr. David Eddy. Eddy found, after doing significant research that only about 13% of medical interventions are supported by, solid scientific evidence and that only 1% of the articles in medical journals are scientifically sound. Why is that? Because most of those articles quote from other articles which make unsupported and unfounded claims.

The Increasing Popularity of Alternative Medicine

After publication of David M. Eisenberg's 1993 *New England Journal of Medicine* article (*Unconventional Medicine in the United States*), various factions of modern medicine became increasingly anxious and aggressive in their accusations that alternative approaches to medical healthcare were not supported by research. This same group was NOT forthcoming in mentioning the small fraction of established medical practices that have ever met these same stringent

requirements. They certainly never mention the low level of success which medicine delivers for the same health complaints that chiropractic is so famous for.

The High Risks of the Medical Approach

Dr. Lucian Leape, researcher at the Harvard Medical School of Public Health, also states that only 13% of medical procedures have ever been tested for appropriateness by randomized trials. He noted that adverse events occurred in 3.7 percent of all hospitalizations. Worse yet, 13.6 percent of those adverse events led to death![3]. He is also quoted as saying:

"Medicine is now a high risk industry, like aviation. But, the chance of dying in an aviation accident is one in 2 million, while the risk of dying from a medical accident is one in 2 million, while the risk of dying from a medical accident is one in 200!"

The most comprehensive review of "adverse events" (also referred to as "Iatrogenic Injury") caused by modern medicine is the article *Death by Medicine*, written by Gary Null, Ph.D.; Carolyn Dean MD, ND; Martin Feldman, MD; Debora Rasio, MD; and Dorothy Smith, PhD.

This fully referenced report reveals that:

2.2 million people experience in-hospital, adverse reactions to prescribed drugs per year.

20 million unnecessary antibiotics are prescribed annually for viral infections 7.5 million unnecessary medical and surgical procedures are performed annually, and

8.9 million people are exposed to unnecessary hospitalization every year!

The most stunning statistic, however, is that

The total number of deaths caused by conventional medicine is an astounding 783,936 per year!

That is a mind-boggling 2147 people killed daily! That's 7 jumbo jet plane crashes, each and every day. That's a 9-11 incident occurring every other day...FOREVER.

The Safety of Chiropractic

Canada has a government-run national health care system. As occurred with Medicare in this country, there had been such pressure on the Canadian government to include chiropractic as a covered benefit, that the Ontario Ministry of Health hired a renowned heath care economist to make a recommendation. The first "Manga Report" was published in 1993.

This comprehensive study reviewed all the published literature on low back pain and made some astounding suggestions. In a nutshell, it concluded that: chiropractic should be the treatment of choice for low back pain – excluding traditional medical care altogether!

The specific Findings of the report were:

There is an overwhelming body of evidence indicating that chiropractic management of low-back pain is more cost-effective than medical management Many medical therapies are of questionable validity or are clearly inadequate There is no clinical or case-control study that demonstrates or even implies that chiropractic spinal manipulation is unsafe in the treatment of low-back pain. Some medical treatments are equally safe, but others are unsafe and generate iatrogenic complications for LBP patients.

Chiropractic is more cost-effective. There would be highly significant cost savings if more management of LBP was transferred from medical physicians to chiropractors. There is good empirical evidence that patients are very satisfied with chiropractic management of LBP and considerably less satisfied with physician management

The specific Recommendations were:

Chiropractic services should be fully insured under the Ontario Health Insurance Plan

Chiropractic services should be fully integrated into the health care system. Because of the high incidence and cost of LBP, hospitals, managed health care groups, community health centers, comprehensive health organizations, and health service organizations and long-term care facilities should employ chiropractors on a full-time and/or part-time basis

A good case could be made for placing chiropractic as the gatekeepers for all musculoskeletal complaints that presented to hospitals.

More Bad News For Medical Patients

A series of articles reporting on the lack of medical training in musculoskeletal disorders was published between 1998 and 2002 by Kevin B. Freedman, MD, It seems that the department chairs of several hospital-based orthopedic residency programs designed a basic examination on musculoskeletal competency and gave it to their residents. 82 per cent of medical school graduates failed the examination. Four years later the test was simplified and, once again, 78% of the examinees failed to demonstrate basic competency in musculoskeletal medicine. When this test was given to final quarter chiropractic students <u>70% of them passed the exact same exam!</u>

The differences between these 2 student groups should be noted. The medical students had already graduated from medical school (as MDs) and had completed their rotations through various hospital departments. Finally, they had been accepted into a hightly competitive orthopedic residency program...the pinnacle of medical musculoskeletal specialists. The chiropractic students however were still just students. 80% medical failure versus 70% chiropractic success

A. The Safety of Cervical Adjusting

No one pays closer attention to injury statistics than Malpractice Insurance carriers. Scott Haldeman, DC, PhD, MD, reviewed malpractice claims records for a 10-year period between 1988 and 1997. In reviewing the outcomes following the application of 134.5 million cervical manipulations (commonly referred to as the chiropractic adjustment), the records indicated that there were 23 reported cases of stroke or vertebral artery dissection (VAD). Of this group, 10 of the patients had the complicating factors of high blood pressure, use of oral contraceptives, or a history of smoking, all of which are associated with vascular disease. The actual incidence of stroke or VAD following cervical manipulation was found to be one per 5.85 million cervical adjustments. That means that the average chiropractor could work for 1430 years (or practice 48 full chiropractic careers!) before they might be involved with this type of litigation. Other reports listing a higher frequency of adverse events have been compromised by the tendency of those authors to inappropriately list the pracitioner as a chiropractor, even when it turned out that the injury was caused by a medical

doctor, a physical therapist or a hairdresser!

Rather than raising concerns about the safety of chiropractic, these statistics emphasize that spinal manipulation, in the hands of unskilled practitioners, is dangerous, and the practice must be closely regulated.

The World Health Organization recently released a comprehensive set of guidelines that clearly states that chiropractic is a separate profession, rather than a set of techniques that can be learned in short courses by other health professionals. They also make it clear that medical doctors and other health professionals, in countries where the practice of chiropractic is not regulated by law, should undergo extensive training to re-qualify as chiropractors before claiming to offer chiropractic services. In some countries there have been recent efforts by medical groups to provide short courses of approximately 200 hours in chiropractic technique. WHO's guidelines indicate that a medical graduate should a require an additional minimum of 1800 class hours, including 1000 hours of supervised clinical training, before claiming to offer chiropractic services.

B. The Safety of Low Back Adjusting

Lower back injury alleged to have occurred following spinal manipulative therapy has been reported in patients with pre-existing disc herniation or prolapse. While it is suggested that the forces required to cause a disruption of the annular fibers of the healthy intervertebral disc well exceed that of a rotational manipulative thrust, some disc herniation/protrusion may certainly be aggravated by an inappropriately applied manipulative maneuver, as it may be by other simple activities of daily living such as bending, sneezing, or lifting. The most frequently described severe complication is compression of the cauda equina by massive midline nuclear herniation at the level of the 3rd, 4th or 5th intervertebral disc. Of the 30 cauda equina complications associated with manipulation reported in the French, German and English literature over an 80 year period, only 8 were allegedly related to chiropractic treatment.

D) Patient Satisfaction

Recent History

2000 - 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 J Manipulative Physiol Ther 2000 (May); 23 (4): 239–245 http://www.ncbi.nlm.nih.gov/pubmed/10820296?dopt=Abstract Patients with chronic low-back pain treated by chiropractors show greater improvement and satisfaction at 1 month than patients treated by family physicians. Nonclinical factors may play an important role in patient progress.

Findings from the Health Resources and Services Administration-funded project will include a report on the influence of practice activities, including more frequent visits by chiropractic patients, on the clinical course of low-back pain and patient outcomes.

2009 - Consumer Reports Lists Chiropractic Patients as Most Satisfied Consumer Reports ~ May 2009

http://www.consumerreports.org/cro/magazine-archive/may-2009/health/back-pain/overview/back-pain-ov.htm

A study in the May issue of Consumer Reports shows that hands-on therapies were tops among treatments for relief of back pain. The study, which surveyed more than 14,000 consumers, was conducted by the Consumer Reports Health Ratings Center. The report states that, "eighty-eight percent of those who tried chiropractic manipulation said it helped a lot, and 59 percent were 'completely' or 'very' satisfied with their chiropractor."

2009 - <u>Consumer Reports ~ May 2009</u> plus this <u>second review</u>. April 10, 2009

http://www.consumerreports.org/cro/magazine-archive/may-2009/health/back-pain/overview/back-pain-ov.htm

A study in the May issue of Consumer Reports shows that hands-on therapies were tops among treatments for relief of back pain. The study, which surveyed more than 14,000 consumers, was conducted by the Consumer Reports Health Ratings Center.

According to the report, the survey respondents tried a variety of different treatments and rated the treatments on how helpful and satisfied they were with the results. The report concluded that hands-on therapies were the top-rated, and that, "eighty-eight percent of those who tried chiropractic manipulation said it helped a lot, and 59 percent were 'completely' or 'very' satisfied with their chiropractor."

Results at a glance:

Professional	Highly satisfied
Chiropractor	59%
Physical therapist	55%
Acupuncturist	53%
Physician, specialist	44%
Physician, primary-care doctor	34%

From the article:

About 80 percent of U.S. adults have at some point been bothered by back pain. The Consumer Reports Health Ratings Center recently surveyed more than 14,000 subscribers who had lower-back pain in the past year but had never had back surgery. More than half said pain severely limited their daily routine for a week or longer and 88 percent said it recurred through the year. Many said the pain interfered with sleep, sex, and efforts to maintain a healthy weight. Back pain can be tough to treat. Most of our respondents tried five or six different treatments. They rated the helpfulness of the treatments tried and their satisfaction with the health-care professionals visited.

Hands-on therapies were among the top-rated. Fifty-eight percent of those who tried chiropractic manipulation said it helped a lot, and 59 percent were "completely" or "very" satisfied with their chiropractor. Massage and physical therapy were close runners-up.

Many of those who tried spinal injections found them to be very helpful, although the techniques their doctors used varied. Most respondents had used some type of medication. Forty-five percent of those who took prescription drugs said they helped a lot, double the percentage of those who said they were helped by overthe-counter medications.

2006 - Chiropractic Services in the Canadian Armed Forces: A Pilot Project *Military Medicine 2006 (Jun); 171 (6): 572–576*

http://www.ncbi.nlm.nih.gov/pubmed/16808144?dopt=AbstractPlus

This article reports on satisfaction associated with the introduction of chiropractic services within a military hospital, through a Canadian Armed Forces Pilot Project. We distributed a 27-item survey that inquired about demographic information and satisfaction with chiropractic services to 102 military personnel presenting for onsite chiropractic services at the Archie McCallum Hospital in Halifax, Nova Scotia. The majority of military personnel (94.2%) and referring physicians (80.0%) expressed satisfaction with chiropractic services.

2006 - Factors Associated With Patient Satisfaction With Chiropractic Care:Survey and Review of the Literature

J Manipulative Physiol Ther 2006 (Jul); 29 (6):455–462 http://www.ncbi.nlm.nih.gov/pubmed/16904491

The results here generally confirm the findings elsewhere in the literature. Of the 23% of the adult population who have ever visited a chiropractor, overall rates of satisfaction are once again found to be quite high (83% satisfied or better) and the number dissatisfied is quite low (less than 10% dissatisfied or very dissatisfied). This is remarkable given the fact that much of the financial burden of the care is borne by patients, and the preponderance of care is for difficult chronic problems of back and neck.

2006 - 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):288–296*

http://www.ncbi.nlm.nih.gov/pubmed/16690383

A total of 115 patients were contacted, of whom 94 became study participants, resulting in 60 women (64%) and 34 men. The mean age was 39.6 years (SD, 15.7). The mean number of visits was 24.5 (SD, 21.2). Pain levels improved significantly from a mean of 7.6 (median, 8.0) before treatment to 1.9 (median, 2.0) after treatment (P < .0001). The overall patient satisfaction rate was 94%.

2005 - Back Pain and Satisfaction with Chiropractic Treatment: What Role Does the Physical Outcome Play?

Clin J Pain 2005 (Jul); 19 (4): 263–268

http://www.ncbi.nlm.nih.gov/pubmed/12840621?dopt=Abstract

Patients were asked about effects on pain, anxiety, normal activity, work, depression, lifestyle, satisfaction, and overall improvement. Stepwise multiple regression analyses were used to evaluate the contribution of change scores to overall improvement and satisfaction. There are initial indications in the literature that information giving, and the reconfiguration of patients' perceptions of the problem, may contribute to patient satisfaction generally.

2002 - Comparing the Satisfaction of Low Back Pain Patients Randomized to Receive Medical or Chiropractic Care: Results from the UCLA Low-back Pain Study

Am J Public Health 2002 (Oct); 92 (10): 1628–1633

Hertzman-Miller RP, Morgenstern H, Hurwitz EL, Yu F, Adams AH, Harber P, Kominski GF

Department of Epidemiology, UCLA School of Public Health, University of California-Los Angeles, Los Angeles, CA, USA. hertzman_miller@post.harvard.edu http://www.ncbi.nlm.nih.gov/pubmed/12356612

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.

OBJECTIVES: This study examined the difference in satisfaction between patients assigned to chiropractic vs medical care for treatment of low back pain in a managed care organization.

METHODS: Satisfaction scores (on a 10-50 scale) after 4 weeks of follow-up were compared among 672 patients randomized to receive medical or chiropractic care. RESULTS: The mean satisfaction score for chiropractic patients was greater than the score for medical patients (crude difference = 5.5; 95% confidence interval = 4.5, 6.5). Self-care advice and explanation of treatment predicted satisfaction and reduced the estimated difference between chiropractic and medical patients' satisfaction.

CONCLUSIONS: Communication of advice and information to patients with low back pain increases their satisfaction with providers and accounts for much of the difference between chiropractic and medical patients' satisfaction.

2002 - Comparing the Satisfaction of Low Back Pain Patients Randomized to Receive Medical or Chiropractic Care: Results From the UCLA Low-back Pain Study

Am J Public Health 2002 (Oct); 92 (10): 1628–1633 http://www.ncbi.nlm.nih.gov/pubmed/12356612

Communication of advice and information to patients with low back pain increases their satisfaction with providers and accounts for much of the difference between chiropractic and medical patients' satisfaction.

2001 - Patient Satisfaction With the Chiropractic Clinical Encounter

http://apha.confex.com/apha/129am/techprogram/paper_19986.htm The 129th Annual Meeting of APHA

Data were collected from 2986 adult patients of 172 U.S. and Canadian chiropractors in a practice-based research program over a one-week period in November 1999. Of the 1822 patients reporting pain, 56.2% rated the care they received for it as "excellent," 30.6% "very good;" 9.3% "good;" 1.3% "fair;" and 0.2% "poor;" 2.0% did not respond. Patients were quite satisfied with the care they received with 83% reporting that their chiropractor always listened carefully to them and always explained things in a way they could understand; 88% reported their chiropractor always spont enough time with them.

2001 - The Gallup Study

In 1991 the Gallup Organization performed a nationwide demographic study to determine the attitudes, opinions, and behaviors of both users and nonusers of chiropractic services.

Overall, 90% felt that chiropractic health care was effective: more than 80% were satisfied with the treatment they received; nearly 75% felt that most of their expectations were met during the last visit or series of visits; 68% said they would likely see a doctor of chiropractic again for treatment of a similar condition, and 50% would likely be willing to see a doctor of chiropractic for some other problem chiropractors treat. Nearly 80% of the chiropractic users felt that the cost of chiropractic treatment was reasonable.

Demographic Characteristics of Users of Chiropractic Services. The Gallup Organization, Princeton, New Jersey - 1991

2001 - Patient Satisfaction with the Chiropractic Clinical Encounter: Report From a Practice-based Research Program

Journal of the Neuromusculoskeletal System 2001:9 (4):109–117 http://www.chiro.org/ChiroZine/ABSTRACTS/Patient Satisfaction With Chiropractic .shtml

The majority of patients were highly satisfied with their care; 85.0% reported that their chiropractor always listened carefully; 85.3% that the DC explained things understandably; 88.2% that the DC showed respect for what they had to say; and 75.6% that he/she involved them in decisions as much as they wanted. The median proportion of patients, per DC, with a chief complaint who said their doctor always spent enough time with them was 82% (IQR: 19%) and 82.3% reported that their chiropractors never recommended more visits than necessary.

2001 - Patient Satisfaction with Chiropractic Physicians in an Independent Physicians' Association

J Manipulative Physiol Ther 2001 (Nov);24 (9):556–559 http://www.ncbi.nlm.nih.gov/pubmed/11753328

Various aspects of chiropractic care were given a rating of "excellent" by the following percentage of respondents: Length of time to get an appointment (84.9%); convenience of the office (57.7%); access to the office by telephone (77.3%); length of wait at the office (75.7%); time spent with the provider (74.3%); explanation of what was done during the visit (72.8%); technical skills of the chiropractor (83.3%); and the personal manner of the chiropractor (92.4%). The visit overall was rated as excellent by 83.3% of responders, and 95.3% stated they would definitely recommend the provider to others.

2001 - Patient Satisfaction with Chiropractic Physicians in an Independent Physicians' Association

J Manipulative Physiol Ther 2001 (Nov); 24 (9):556–559 http://www.ncbi.nlm.nih.gov/pubmed/11753328 Various aspects of chiropractic care were given a rating of "excellent" by the following percentage of respondents: Length of time to get an appointment (84.9%); convenience of the office (57.7%); access to the office by telephone (77.3%); length of wait at the office (75.7%); time spent with the provider (74.3%); explanation of what was done during the visit (72.8%); technical skills of the chiropractor (83.3%); and the personal manner of the chiropractor (92.4%). The visit overall was rated as excellent by 83.3% of responders, and 95.3% stated they would definitely recommend the provider to others.

E) Effectiveness of Chiropractic Treatment (Post 2000)

2013 - Osteopathic Manual Treatment and Ultrasound Therapy for Chronic Low Back Pain

A Randomized Controlled Trial

John C. Licciardone, DO, MS, MBA, Dennis E. Minotti, DO, Robert J. Gatchel, PhD, Cathleen M. Kearns, BA, Karan P. Singh, PhD Ann Fam Med. 2013;11(2):122-129.

Abstract and Introduction

Abstract

Purpose We studied the efficacy of osteopathic manual treatment (OMT) and ultrasound therapy (UST) for chronic low back pain.

Methods A randomized, double-blind, sham-controlled, 2×2 factorial design was used to study OMT and UST for short-term relief of nonspecific chronic low back pain. The 455 patients were randomized to OMT (n = 230) or sham OMT (n = 225) main effects groups, and to UST (n = 233) or sham UST (n = 222) main effects groups. Six treatment sessions were provided over 8 weeks. Intention-to-treat analysis was performed to measure moderate and substantial improvements in low back pain at week 12 (30% or greater and 50% or greater pain reductions from baseline, respectively). Five secondary outcomes, safety, and treatment adherence were also assessed.

Results There was no statistical interaction between OMT and UST. Patients receiving OMT were more likely than patients receiving sham OMT to achieve moderate (response ratio [RR] = 1.38; 95% CI, 1.16-1.64; *P* <.001) and substantial (RR = 1.41, 95% CI, 1.13-1.76; *P* = .002) improvements in low back pain at week 12. These improvements met the Cochrane Back Review Group criterion for a medium effect size. Back-specific functioning, general health, work disability specific to low back pain, safety outcomes, and treatment adherence did not differ between patients receiving OMT and sham OMT. Nevertheless, patients in the OMT group were more likely to be very satisfied with their back care throughout the study (*P* <.001). Patients receiving OMT used prescription drugs for low back pain less frequently during the 12 weeks than did patients in the sham OMT group (use ratio = 0.66, 95% CI, 0.43-1.00; *P* = .048). Ultrasound therapy was not efficacious.

Conclusions The OMT regimen met or exceeded the Cochrane Back Review Group criterion for a medium effect size in relieving chronic low back pain. It was safe, parsimonious, and well accepted by patients.

2013 - Adding Chiropractic Manipulative Therapy to Standard Medical Care for Patients With Acute Low Back Pain: Results of a Pragmatic Randomized Comparative Effectiveness Study

Spine:15 April 2013;38(8):627-634

Goertz, Christine M. DC, PhD*; Long, Cynthia R. PhD*; Hondras, Maria A. DC, MPH*; Petri, Richard MD⁺; Delgado, Roxana MS[‡]; Lawrence, Dana J. DC, MMedEd, MA§; Owens, Edward F. MS, DC¶; Meeker, William C. DC, MPHI

Abstract

Study Design. Randomized controlled trial.

Objective. To assess changes in pain levels and physical functioning in response to standard medical care (SMC) versus SMC plus chiropractic manipulative therapy (CMT) for the treatment of low back pain (LBP) among 18 to 35-year-old active-duty military personnel.

Summary of Background Data. LBP is common, costly, and a significant cause of long-term sick leave and work loss. Many different interventions are available, but there exists no consensus on the best approach. One intervention often used is manipulative therapy. Current evidence from randomized controlled trials demonstrates that manipulative therapy may be as effective as other conservative treatments of LBP, but its appropriate role in the healthcare delivery system has not been established.

Methods. Prospective, 2-arm randomized controlled trial pilot study comparing SMC plus CMT with only SMC. The primary outcome measures were changes in back-related pain on the numerical rating scale and physical functioning at 4 weeks on the Roland-Morris Disability Questionnaire and back pain functional scale (BPFS). Results. Mean Roland-Morris Disability Questionnaire scores decreased in both groups during the course of the study, but adjusted mean scores were significantly better in the SMC plus CMT group than in the SMC group at both week 2 (P < 0.001) and week 4 (P = 0.004). Mean numerical rating scale pain scores were also significantly better in the group that received CMT. Adjusted mean back pain functional scale scores were significantly higher (improved) in the SMC plus CMT group than in the SMC plus CMT group than in the SMC plus CMT disted mean back pain functional scale scores were significantly higher (improved) in the SMC plus CMT group than in the SMC group at both week 2 (P < 0.001) and week 4 (P = 0.004). **Conclusion.** The results of this trial suggest that CMT in conjunction with SMC offers a significant advantage for decreasing pain and improving physical functioning when compared with only standard care, for men and women between 18 and 35 years of age with acute LBP.

Comment:This study did not compare chiropractic care to medical care for patients with back problems. This study looked at the difference between patients who received only medical care versus those who received both chiropractic and medical care for acute lower back pain.

This study addressed patient responses relative to pain and physical functioning for the both the group receiving only medical care and the group that also received chiropractic. The 91 subjects in this study were active-duty US military personnel between the ages of 18 and 35 years. The study was conducted from February 2008 to June 2009 at William Beaumont Army Medical Center (WBAMC), Fort Bliss, El Paso, Texas.

Lead author, Christine Goertz, D.C., Ph.D., vice chancellor for research and health policy for Palmer College of Chiropractic, explained the reasoning behind the study by saying, "While a number of studies have shown spinal manipulation to be effective in treating low back pain in research settings, the appropriate role of chiropractic care in treating low back pain within the health care delivery system, including the military, has not been clearly established." The results showed that those who received the chiropractic care in addition to the medical care did significantly better both with pain reduction and functional ability, than those who received only medical care. Col. Richard Petri, Chief of the Interdisciplinary Pain Management Center (IPMC) at WBAMC commented, "This is a significant step for recognizing the value of chiropractic care in the military," he said. "Continued research in this area will ultimately result in better healthcare delivery systems as well as the improved health of our beneficiaries."

Wayne B. Jonas, M.D., President and CEO of Samueli Institute who funded the study noted, "It is critical that we explore drug-less approaches to reduce pain." He added, "Chiropractic manipulation is an important option to consider for musculoskeletal disorders, which is the most prevalent pain complaint in the military."

The study authors concluded, "The results of this trial suggest that CMT (Chiropractic Manipulative Therapy) in conjunction with SMC (Standard Medical care) offers a significant advantage for decreasing pain and improving physical functioning when compared with only standard (medical) care, for men and women between 18 and 35 years of age with acute LBP.

2012 - Predictors of Improvement in Patients With Acute and Chronic Low Back Pain Undergoing Chiropractic Treatment

J Manipulative Physiol Ther. 2012 (Sep); 35 (7): 525-33

Cynthia K. Peterson, DC, Jennifer Bolton, PhD, MAEd, B. Kim Humphreys, DC, PhD Professor, Chiropractic Department, Faculty of Medicine, University of Zürich, Zürich, Switzerland

OBJECTIVES: The purpose of this study was to investigate outcomes and prognostic factors in patients with acute or chronic low back pain (LBP) undergoing chiropractic treatment.

METHODS: This was a prognostic cohort study with medium-term outcomes. Adult patients with LBP of any duration who had not received chiropractic or manual therapy in the prior 3 months were recruited from multiple chiropractic practices in Switzerland. Participating doctors of chiropractic were allowed to use their typical treatment methods (such as chiropractic manipulation, soft tissue mobilization, or other methods) because the purpose of the study was to evaluate outcomes from routine chiropractic practice. Patients completed a numerical pain rating scale and Oswestry disability questionnaire immediately before treatment and at 1 week, 1 month, and 3 months after the start of treatment, together with self-reported improvement using the Patient Global Impression of Change.

RESULTS: Patients with acute (<4 weeks; n = 523) and chronic (>3 months; n = 293) LBP were included. Baseline mean pain and disability scores were significantly (P < .001) higher in patients with acute LBP. In both groups of patients, there were significant (P < .0001) improvements in mean scores of pain and disability at 1 week, 1 month, and 3 months, although these change scores were significantly greater in the acute group. Similarly, a greater proportion of patients in the acute group reported improvement at each follow-up. The most consistent predictor was self-reported improvement at 1 week, which was independently associated with improvement at 1 month (adjusted odds ratio [OR], 2.4 [95% confidence interval, 1.3-4.5] and 5.0 [2.4-10.6]) and at 3 months (2.9 [1.3-6.6] and 3.3 [1.3-8.7]) in

patients with acute and chronic pain, respectively. The presence of radiculopathy at baseline was not a predictor of outcome.

CONCLUSIONS: Patients with chronic and acute pain reporting that they were "much better" or "better" on the Patient Global Impression of Change scale at 1 week after the first chiropractic visit were 4 to 5 times more likely to be improved at both 1 and 3 months compared with patients who were not improved at 1 week. Patients with acute pain reported more severe pain and disability initially but recovered faster. Patients with chronic and acute back pain both reported good outcomes, and most patients with radiculopathy also improved.

2012 -Conservative Spine Care: The State of the Marketplace and Opportunities for Improvement

White Paper Optum

Overview

Services for the diagnosis and treatment of orthopedic musculoskeletal (MSK) complaints represent the largest category of medical expenditures in the United States. Recent claims data analysis, gathered for a 12-month period through the 3rd quarter of 2011, found that 17% of medical expenses were related to orthopedic services.

The management of neck and low back pain easily outpaced expenditures for all other types of orthopedic disorders. Despite advancements in understanding evidence-informed management options, outcomes and expenses related to treatment of MSK conditions in the U.S. have not improved in recent years.

Given the sizable demand for spine care in the marketplace, it is increasingly important to improve delivery at both the systems and individual levels. Although consistent clinical guidelines are well established, patterns of practice with respect to treatment of lower back pain (LBP) vary widely, and are notoriously resistant to change. An additional hurdle is that patients often use questionable information (often from non-medical sources) to follow a treatment path that is contrary to evidence-based clinical practice guidelines. Available data indicates that more than 80% of spine care costs are associated with non-surgical services. Given that reality, it is clear that a conservative approach to spine care is a priority to more effective management of expenditures and enhanced outcomes related to orthopedic treatment of musculoskeletal issues.

This paper examines how the current health care delivery system can affect the quality of care and summarizes current recommended high quality clinical practice guidelines. A discussion of specific implementation strategies that can meaningfully advance the quality of care and more effectively manage expenses are laid out in detail in a separate white paper from OptumHealth®

Care Solutions, Inc. (OptumHealth) titled "Innovative Approaches to Enhanced Spine Care Treatment." The current environment Pain complaints are a leading reason for medical visits, and MSK issues rank as the top concern. Within this category, back pain is the most common ailment confronting individuals. Despite extensive research and efforts to reduce the personal, societal, and economic burdens of LBP issues, it remains one of the ten most costly medical conditions in the United States.

Non-specific LBP encompasses approximately 85% of all back pain diagnoses, affecting 80% of all adults at a cost estimated at \$100 billion annually.

About 25% of individuals experiencing back pain will seek help from a health care provider. Nearly three-quarters of these patients visit either a physician or chiropractor. Estimates suggest around 85 - 90% of primary care patients with LBP are diagnosed with non-specific back pain, where the underlying disease or pathology remains unknown.

The management of LBP can be complex. It is best viewed as a recurrent disorder that can occur anytime in a person's life. It can fluctuate between "no" or "mild" pain to "debilitating" pain. A substantial majority of those who suddenly develop LBP will see their condition improve quickly with or without professional care. Although symptoms usually subside in less than three months, recurrences and flare-ups often occur within one year. The prognosis can be grim for those experiencing persistent pain.

The early identification of individuals "at risk' of developing long-standing pain and disability has been advocated as a means to improving health and economic outcomes.

The management of LBP can also be costly. An OptumInsight TM analysis of internal data found the treatment of orthopedic conditions is the top cost category, representing 17% of overall medical expenses. This surpasses the costs attributed to cardiology, gastroenterology, oncology, etc. of overall medical expenses. Spine care services account for the largest distribution of orthopedic expenditures (46%). More than 80% of spine care costs are associated with non-surgical treatments. From an episode-based perspective, chiropractors are the most cost-efficient health care providers for the initial management of low back pain.

2011 - Predictors for Identifying Patients With Mechanical Neck Pain Who Are Likely to Achieve Short-Term Success With Manipulative Interventions Directed at the Cervical and Thoracic Spine

J Manipulative Physiol Ther. 2011 (Mar); 34 (3):144–152 http://www.ncbi.nlm.nih.gov/pubmed/21305970

The current study identified several prognostic clinical factors including pain intensity greater than 4.5 points, cervical extension less than 46°, hypomobility of T1 vertebra, a negative ULTT, and female sex that may potentially identify patients with mechanical neck pain who are likely to experience a rapid and positive response to the application of cervical and thoracic spine thrust manipulations. If 4 of 5 variables were present (LR+, 1.9), the likelihood of success increased from 61.7% to 86.3%.
2011 - Management of Neck Pain in Royal Australian Air Force Fast Jet Aircrew

Military Medicine 2011 (Jan);176 (1):106–109

http://www.ncbi.nlm.nih.gov/pubmed/21305970

Eighty-two RAAF FJ aircrew responded to the survey. Ninety-five percent of the respondents experienced flight-related neck pain. The most commonly sought treatment modalities were on-base medical and physiotherapy services. Many respondents reported that currently provided on-base treatment and ancillary services such as chiropractic therapy are the most effective in alleviating symptoms.

2011 - Does maintained Spinal manipulation therapy for chronic nonspecific low back pain result in better long term outcome?

Senna MK, Machaly SA.

Spine (Phila Pa 1976). 2011 Jan 17. [Epub ahead of print] Source:Rheumatology and Rehabilitation Department, Mansoura Faculty of Medicine, Mansoura University.

Abstract

Study Design. A prospective single blinded placebo controlled study was conducted.Objective. to assess the effectiveness of spinal manipulation therapy (SMT) for the management of chronic non-specific low back pain (LBP) and to determine the effectiveness of maintenance SMT in long-term reduction of pain and disability levels associated with chronic low-back conditions after an initial phase of treatments.

Summary of background. SMT is a common treatment option for low back pain. Numerous clinical trials have attempted to evaluate its effectiveness for different subgroups of acute and chronic LBP but the efficacy of maintenance SMT in chronic non-specific LBP has not been studied.

Subjects and Methods. 60 patients with chronic, nonspecific LBP lasting at least 6 months were randomized to receive either (1) 12 treatments of sham SMT over a one-month period, (2) 12 treatments, consisting of SMT over a one-month period, but no treatments for the subsequent nine months, or (3) 12 treatments over a one-month period, along with "maintenance spinal manipulation" every two weeks for the following nine months. To determine any difference among therapies, we measured pain and disability scores, generic health status, and back-specific patient satisfaction at baseline and at 1-month, 4-month, 7-month and 10-month intervals.

Results: Patients in second and third groups experienced significantly lower pain and disability scores than first group at the end of 1-month period (P = 0.0027 and 0.0029 respectively). However, only the third group that was given spinal manipulations during the follow-up period showed more improvement in pain and disability scores at the 10-month evaluation. In the no maintained SMT group, however, the mean pain and disability scores returned back near to their pretreatment level.

Conclusion. SMT is effective for the treatment of chronic non specific LBP. To obtain long-term benefit, this study suggests maintenance spinal manipulations after the initial intensive manipulative therapy

2010 - Effectiveness of manual therapies: the UK evidence report.

Chiropr Osteopat. 2010 Feb 25:18:3.

Bronfort G, Haas M, Evans R, Leininger B, Triano J.

http://www.ncbi.nlm.nih.gov/pubmed/20184717

Source Northwestern Health Sciences University, Bloomington, MN, USA.

Abstract

BACKGROUND:

The purpose of this report is to provide a succinct but comprehensive summary of the scientific evidence regarding the effectiveness of manual treatment for the management of a variety of musculoskeletal and non-musculoskeletal conditions.

METHODS:

The conclusions are based on the results of systematic reviews of randomized clinical trials (RCTs), widely accepted and primarily UK and United States evidencebased clinical guidelines, plus the results of all RCTs not yet included in the first three categories. The strength/quality of the evidence regarding effectiveness was based on an adapted version of the grading system developed by the US Preventive Services Task Force and a study risk of bias assessment tool for the recent RCTs. **RESULTS:**

By September 2009, 26 categories of conditions were located containing RCT evidence for the use of manual therapy: 13 musculoskeletal conditions, four types of chronic headache and nine non-musculoskeletal conditions. We identified 49 recent relevant systematic reviews and 16 evidence-based clinical guidelines plus an additional 46 RCTs not yet included in systematic reviews and guidelines. Additionally, brief references are made to other effective nonpharmacological, non-invasive physical treatments.

CONCLUSIONS:

Spinal manipulation/mobilization is effective in adults for: acute, subacute, and chronic low back pain; migraine and cervicogenic headache; cervicogenic dizziness; manipulation/mobilization is effective for several extremity joint conditions; and thoracic manipulation/mobilization is effective for acute/subacute neck pain. The evidence is inconclusive for cervical manipulation/mobilization alone for neck pain of any duration, and for manipulation/mobilization for mid back pain, sciatica, tension-type headache, coccydynia, temporomandibular joint disorders, fibromyalgia, premenstrual syndrome, and pneumonia in older adults. Spinal manipulation is not effective for asthma and dysmenorrhea when compared to sham manipulation, or for Stage 1 hypertension when added to an antihypertensive diet. In children, the evidence is inconclusive regarding the effectiveness for otitis media and enuresis, and it is not effective for infantile colic and asthma when compared to sham manipulation. Massage is effective in adults for chronic low back pain and chronic neck pain. The evidence is inconclusive for knee osteoarthritis, fibromyalgia, myofascial pain syndrome, migraine headache, and premenstrual syndrome. In children, the evidence is inconclusive for asthma and infantile colic.

2010 - The Cervical Flexion-Relaxation Ratio: Reproducibility and **Comparison Between Chronic Neck Pain Patients and Controls** Spine (Phila Pa 1976). 2010 (Nov 15);35 (24):2103-2108 http://www.ncbi.nlm.nih.gov/pubmed/20581761

The cervical extensor muscles exhibit a consistent flexion-relaxation (FFR) phenomenon in healthy control subjects and the measurement is highly reproducible when measured 4 weeks apart in both controls and chronic neck pain patients. The FRR in neck pain patients is significantly higher than in control subjects suggesting that this measure may be a useful marker of altered neuromuscular function.

2009 - Outcome of Pregnancy-Related Lumbopelvic Pain Treated According to a Diagnosis-Based Decision Rule

J Manipulative Physiol Ther 2009 (Oct); 32 (8): 616-624

Donald R. Murphy, DC, Eric L. Hurwitz, DC, PhD, Ericka E. McGovern, DC Rhode Island Spine Center, Pawtucket, RI 02860, USA.

OBJECTIVE: The purpose of this study was to describe the clinical outcomes of patients with pregnancy-related lumbopelvic pain (PRLP) treated according to a diagnosis-based clinical decision rule.

METHODS: This was a prospective observational cohort of consecutive patients with PRLP. Data on 115 patients were collected at baseline and on 78 patients at the end of the active treatment. Disability was measured using the Bournemouth Disability Questionnaire (BDQ). Pain intensity was measured using the Numerical Rating Scale for pain (NRS). Patients were also asked to self-rate their improvement. Care was provided by a chiropractic physician/physical therapist team.

Interventions Each patient was examined and treated in the manner that would occur in ordinary clinical circumstances at the Rhode Island Spine Center. Care was provided by a chiropractic physician/physical therapist team. Details of this DBCDR approach are provided elsewhere. [8] This decision rule is designed to allow the clinician to formulate a working diagnosis upon which treatment decisions can be made.

It is based on 3 questions of diagnosis: [8]:

- 1. Are the symptoms with which the patient is presenting reflective of a visceral disorder, or a serious or potentially life-threatening disease? This question considers findings such as fever, chills or rigors, previous history of cancer and, particularly in the pregnant patient, bleeding, spotting, unusual discharge, or episodes of diarrhea. The answers to this question are sought via medical history, physical examination and, when indicated, special tests.
- 2. From where is the patient's pain arising? This question considers signs suggestive of pain arising from disk, joint, nerve, or muscle. The following signs were considered:
 - a. **Centralization signs:** these are thought to arise from disk pain and were evaluated via historical factors13 as well as the end-range loading examination that is part of the McKenzie system. [14]
 - b. **Segmental pain provocation signs:** these are thought to arise from joint pain and were evaluated via historical factors13, 15 as well as pain provocation tests. [13, 16-18]
 - c. **Neurodynamic signs:** these are thought to arise as a result of pain from neural structures, particularly the nerve root, and were

evaluated via historical factors, nerve root provocation tests, [19, 20] and neurologic examination.

- d.**Myofascial signs:** there are thought to arise from myofascial trigger points and were evaluated via trigger point palpation. [21]
- 3. What has gone wrong with this person as a whole that would cause the pain experience to develop and persist? This question considers factors that have the potential to perpetuate the pain experience. The following factors were considered:

a. **Dynamic instability of the lumbar spine or pelvis:** this is thought to arise from impairment of the motor control system [22] and was evaluated with examination procedures such as the hip extension test, [23] the segmental instability test, [24] and the active straight leg raise test. [25]

b. **Central pain hypersensitivity:** this is thought to arise from sensitization of neurons involved in the transmission, relay, localization, and emotional response to nociception as well as deficit the nociceptive inhibitory mechanisms [26] It was detected with assessment of nonorganic signs. [27]

c. **Psychological issues such as fear, catastrophizing, passive coping, or depression.** These psychological responses to the pain experience that are maladaptive and can interfere with recovery. [28] They were be detected via patient interview and the Fear Avoidance Beliefs Questionnaire. [28]

From the working diagnosis derived from the answers to these 3 questions, a management strategy was formulated that was designed to address each of the factors the clinician felt was most relevant (Fig 2). In the context of the DBCDR, the responses to the 3 questions of diagnosis were:

Question 1:

Further investigation or referral. These patients fell outside the scope of the present study.

Question 2:

Centralization signs: end-range loading maneuvers in the direction of centralization of symptoms [14]; distraction manipulation. [30, 31]

Segmental pain provocation signs: lumbar or sacroiliac joint mobilization or manipulation. [32] The method used was at the discretion of each practitioner; however, the most commonly used technique was high-velocity, low-amplitude manipulation performed in the side lying position. In those patients in whom the size of the abdomen made it difficult or uncomfortable to perform manipulation in the side posture position, the typical alternative treatment was oscillatory mobilization with the patient in the prone position and wedges positioned under the pelvis to attempt to counter rotation the ilia. In these cases, the abdominal piece of the table was dropped out to accommodate the abdomen.

Neurodynamic signs: neural mobilization. [20]

Myofascial signs: myofascial therapies. [33] **Ouestion 3:**

Dynamic instability: stabilization exercise. [34, 35]

Central pain hypersensitivity: education and graded exposure. [36] **Psychological factors:** counseling, education, and graded exposure. [37] With this approach the response to treatment is monitored on each visit and the diagnosis and/or treatment is modified depending on this response.

RESULTS: Fifty-seven patients (73%) reported their improvement as either "excellent" or "good." The mean patient-rated improvement was 61.5%. The mean improvement in BDQ was 17.8 points. The mean percentage of improvement in BDQ was 39% and the median was 48%. Mean improvement in pain was 2.9 points. Fifty-one percent of the patients had experienced clinically significant improvement in disability and 67% patients had experienced clinically significant improvement in pain. Patients were seen an average 6.8 visits. Follow-up data for an average of 11 months after the end of treatment were collected on 61 patients. Upon follow-up, 85.5% of patients rated their improvement as either "excellent" or "good." The mean patient-rated improvement was 83.2%. The mean improvement in BDQ was 68% and the median was 87.5%. Mean improvement in pain was 3.5 points. Seventy-three percent of the patients had experienced clinically significant improvement in disability and 82% patients had experienced clinically significant improvement in pain.

CONCLUSIONS: The management strategy used in this study appeared to yield favorable outcomes in this patient population and appears to be a safe option for patients with PRLP, although because of this study's sample size, rare complications are not likely to be detected. In addition, the absence of randomization and a control group limits interpretation with regard to clinical effectiveness. Randomized, controlled trials are necessary to distinguish treatment effects from the natural history of PRLP.

2009 - Manual therapies and exercise are more effective than alternative therapies for patients with neck pain.

Hurwitz EL, Carragee EJ, Van der Velde G, Carroll LJ, Nordin M, Guzman J, et al. Treatment of Neck Pain:

Non-invasive Interventions. J Manipulative Physiol Ther 2009 Feb;32(2S):S141-175.

THE OBJECTIVE of this best-evidence synthesis was to perform a critical appraisal and synthesize literature

on non-invasive therapies for neck pain and associated disorders.

THIS STUDY conducted a Medline search of literature published between 1980 and 2006 on the use, effectiveness and safety of non-invasive neck pain interventions. The results were screened and rated for relevance, yielding 139 papers that were analyzed in detail.

RESULTS

• For "non-specific" neck pain, the evidence shows that manual therapy, supervised exercise and low-level laser therapy provide a therapeutic benefit and are more effective than alternative treatments. Acupuncture may also be helpful.

• For whiplash-associated disorders, there is evidence that mobilization, exercise and educational videos that include exercises and focus on restoring patients' ability to work and perform activities of daily life are more beneficial than conventional medical care or care involving passive modalities (TENS, ultrasound, diathermy), collars or general advice. • For neck pain without radicular symptoms, therapies that aim at restoring function as soon as possible are more effective than types of therapy that do not have that focus.

CAVEAT

More research is needed on which non-invasive therapies are most effective for different types of neck pain in the short and long term

2008 – Low-Back Pain and Related Leg Complaints

J Manipulative Physiol Ther 2008 Nov;31(9):659-674.

Chiropractic spinal manipulation is widely used to treat low-back pain and related complaints.

Lawrence DJ, Meeker W, Branson R, Bronfort G, Cates JR, Haas M, Haneline M, Micozzi M, Updyke W, Mootz R, Triano JJ, Hawk C. Chiropractic

Management of Low Back Pain and Low Back-Related Leg Complaints: A Literature Synthesis.

THE OBJECTIVE of this literature synthesis was to provide a balanced interpretation of the literature to identify safe and effective treatment options for low-back pain and related leg complaints.

This study conducted a search of literature on low-back pain through the following major healthcare databases:

PubMed, Mantis and the Cochrane Database, yielding 807 source documents, from which guidelines, randomized controlled trials (RCTs), systematic reviews and cohort studies were selected for further review. A total of 12 guidelines documents, 64 RCTs, 20 systematic reviews/meta-analyses and 12 cohort studies were analyzed.

CONCLUSIONS

Existing research evidence on chiropractic management of low-back pain and related leg complaints shows the following:

• Spinal manipulation is used to reduce pain and improve function in patients with both chronic low-back pain and

acute and sub-acute low-back pain.

• Patients undergoing spinal manipulative treatment for low-back pain often experience improvement in function, in addition to a reduction in their pain levels.

 When used in conjunction with spinal manipulation, exercise is likely to improve the patients' symptoms, increase the speed of recovery, and reduce the recurrence of pain.

• Exercise coupled with the reassurance of the healthcare provider that the patient will do well has also been shown valuable in patients with chronic low-back pain and low-back problems associated with radicular symptoms.

• There is less evidence for the use of spinal manipulation in the treatment of leg complaints related to low-back pain.

 Patients experiencing severe symptoms may benefit from pain management in collaboration with other healthcare providers, in addition to spinal manipulative treatment.

2008 - Rehabilitation Program for Traumatic Chronic Cervical Pain Associated With Unsteadiness: A Single Case Study

Chiropractic & Osteopathy 2008 (Nov 17);16 (1):15

http://chiromt.com/content/pdf/1746-1340-16-15.pdf This case report indicates that an 8-week rehabilitation program combining therapeutic exercises with spinal manipulative therapy may have had an effect on improvement of postural control in a trauma Chronic Neck Pain patient with unsteadiness. These results warrant further studies to investigate the relationships between pain amelioration, sensorimotor control of the cervical spine, muscle fitness and postural steadiness

2008 - Predictors For Immediate and Global Responses to Chiropractic Manipulation of the Cervical Spine

J Manipulative Physiol Ther 2008 (Mar);31 (3):172–183 http://www.ncbi.nlm.nih.gov/pubmed/18394493

This study is the first attempt to identify variables that can predict immediate outcomes in terms of improvement and worsening of presenting symptoms, and global improvement, after cervical spine manipulation. From the findings, it was possible to identify some predictors of immediate improvement in presenting symptoms after cervical spine manipulation. Patients presenting with symptoms of "reduced neck, shoulder, arm movement, stiffness," "neck pain," "upper, mid back pain," "headache," "shoulder, arm pain," and/or "none or one presenting symptom only" are likely to report immediate improvement in these symptoms after treatment. Patients presenting with any 4 of these symptoms were shown to have the highest probability of immediate improvement. This finding may enhance clinical decision making for selecting cervical manipulation in the treatment of patients with one or more of these complaints. Although it was possible to identify a number of predictor variables for immediate worsening in presenting symptoms and global improvement after cervical spine manipulation, these failed to provide a robust predictive model for clinical application.

2007 - Diagnosis and Treatment of Low Back Pain: Recommendations from the American College of Physicians/American Pain Society.

V. Snow, D. Casey, J.T. Cross Jr., P. Shekelle, and D.K. Owens Annals of Internal Medicine (volume 147, pages 478-491, 492-504, and 505-514). *Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society; 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 (The Clinical Efficacy Assessment Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel)*

Summary:

When diagnosing musculoskeletal low back pain, doctors need to rule out these serious causes. However, it is not clear that x-rays, computed tomography (CT) (or "CAT scans"), magnetic resonance imaging (MRI), or other tests are necessary in most cases. The main goal in treating low back pain is to decrease the pain and allow patients to resume their normal activities. Treatment options for low back pain include (painkillers, anti-inflammatory drugs, and muscle relaxants), with concurrent nondrug treatments for patients who do not respond to self-care:

rehabilitation,spinal manipulation, exercise therapy, massage, acupuncture,yoga, progressive relaxation, or cognitive-behavioral therapy.

2007 - Conservative Management of Mechanical Neck Disorders:A Systematic Review

J Rheumatol 2007 (May);34 (5):083–1102 http://www.ncbi.nlm.nih.gov/pubmed/17295434

In a review of 88 unique RCTs, the authors found that "Exercise combined with mobilization/manipulation, exercise alone, and intramuscular lidocaine for chronic MND; intravenous glucocorticoid for acute whiplash associated disorders; and lowlevel laser therapy demonstrated either intermediate or longterm benefits. Optimal dosage of effective techniques and prognostic indicators for responders to care should be explored in future research."

2007 - 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);30 (3):15–227 http://www.ncbi.nlm.nih.gov/pubmed/17416276

There is moderate- to high-quality evidence that subjects with chronic neck pain not due to whiplash and without arm pain and headaches show clinically important improvements from a course of spinal manipulation or mobilization at 6, 12, and up to 104 weeks posttreatment. The current evidence does not support a similar level of benefit from massage.

2007 - The Benefits Outweigh the Risks for Patients Undergoing Chiropractic Care for Neck Pain: A Prospective, Multicenter, Cohort Study *J Manipulative Physiol Ther 2007 (Jul);30 (6):408–418*

http://www.ncbi.nlm.nih.gov/pubmed/17693331

In contrast to clinical trials of prescription medication, researchers in the area of conservative care for musculoskeletal complaints have focused their attention on treatment effectiveness and, to a much lesser degree, on adverse events. This study, consisting of patients treated in a wide variety of chiropractic practices and settings, describes both positive and negative, and short- and long-term clinical outcomes for a relatively large study population with neck pain. Although many of the subjects (in this study) had chronic, recurrent neck pain and had undergone prior care for this complaint, many patients experienced benefit from the treatment (based upon diminished pain and disability, the percentage of patients recovered and percentage satisfied with care). Furthermore, many responded relatively guickly to treatment (48% were recovered at the fourth visit).

2007 - 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 Oct 2;147(7):492-504. Chou R, Huffman LH; American Pain Society; American College of Physicians. Source Oregon Evidence-based Practice Center and Oregon Health & Science University, Portland, Oregon 97239, USA. chour@ohsu.edu

Abstract

BACKGROUND: Many nonpharmacologic therapies are available for treatment of low back pain.

PURPOSE:To assess 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).

DATA SOURCES: English-language studies were identified through searches of MEDLINE (through November 2006) and the Cochrane Database of Systematic Reviews (2006, Issue 4). These electronic searches were supplemented by hand searching of reference lists and additional citations suggested by experts.

STUDY SELECTION: Systematic reviews and randomized trials of 1 or more of the preceding therapies for acute or chronic low back pain (with or without leg pain) that reported pain outcomes, back-specific function, general health status, work disability, or patient satisfaction.

DATA EXTRACTION: We abstracted information about study design, population characteristics, interventions, outcomes, and adverse events. To grade methodological quality, we used the Oxman criteria for systematic reviews and the Cochrane Back Review Group criteria for individual trials.

DATA SYNTHESIS: We found good evidence that cognitive-behavioral therapy, exercise, spinal manipulation, and interdisciplinary rehabilitation are all moderately effective for chronic or subacute (>4 weeks' duration) low back pain. Benefits over placebo, sham therapy, or no treatment averaged 10 to 20 points on a 100-point visual analogue pain scale, 2 to 4 points on the Roland-Morris Disability Questionnaire, or a standardized mean difference of 0.5 to 0.8. We found fair evidence that acupuncture, massage, yoga (Viniyoga), and functional restoration are also effective for chronic low back pain. For acute low back pain (<4 weeks' duration), the only nonpharmacologic therapies with evidence of efficacy are superficial heat (good evidence for moderate benefits) and spinal manipulation (fair evidence for small to moderate benefits). Although serious harms seemed to be rare, data on

harms were poorly reported. No trials addressed optimal sequencing of therapies, and methods for tailoring therapy to individual patients are still in early stages of development. Evidence is insufficient to evaluate the efficacy of therapies for sciatica.

IMITATIONS: Our primary source of data was systematic reviews. We included non-English-language trials only if they were included in English-language systematic reviews.

CONCLUSIONS: Therapies with good evidence of moderate efficacy for chronic or subacute low back pain are cognitive-behavioral therapy, exercise, spinal manipulation, and interdisciplinary rehabilitation. For acute low back pain, the only therapy with good evidence of efficacy is superficial heat.

2006 - 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. Epub 2006 Feb 3.

Santilli V, Beghi E, Finucci S.

Source Direttore Cattedra Medicina Fisica e Riabilitativa, Università di Roma, Italy. **Abstract**

BACKGROUND CONTEXT:Acute back pain and sciatica are major sources of disability. Many medical interventions are available, including manipulations, with conflicting results.

PURPOSE: To assess the short- and long-term effects of spinal manipulations on acute back pain and sciatica with disc protrusion.

STUDY DESIGN/SETTING: Randomized double-blind trial comparing active and simulated manipulations in rehabilitation medical centers in Rome and suburbs. **PATIENT SAMPLE**: 102 ambulatory patients with at least moderate pain on a visual analog scale for local pain (VAS1) and/or radiating pain (VAS2).

OUTCOME MEASURES: Pain-free patients at end of treatment; treatment failure (proportion of patients stopping the assigned treatment for lack of effect on pain); number of days with no, mild, moderate, or severe pain; quality of life; number of days on nonsteroidal anti-inflammatory drugs; number of drug prescriptions; VAS1 and VAS2 scores; quality of life and psychosocial findings; and reduction of disc protrusion on magnetic resonance imaging.

METHODS: Manipulations or simulated manipulations were done 5 days per week by experienced chiropractors, with a number of sessions which depended on pain relief or up to a maximum of 20, using a rapid thrust technique. Patients were assessed at admission and at 15, 30, 45, 90, and 180 days. At each visit, all indicators of pain relief were used.

RESULTS:A total of 64 men and 38 women aged 19-63 years were randomized to manipulations (53) or simulated manipulations (49). Manipulations appeared more effective on the basis of the percentage of pain-free cases (local pain 28 vs. 6%; p<.005; radiating pain 55 vs. 20%; p<.0001), number of days with pain (23.6 vs. 27.4; p<.005), and number of days with moderate or severe pain (13.9 vs. 17.9; p<.05). Patients receiving manipulations had lower mean VAS1 (p<.0001) and VAS2 scores (p<.001). A significant interaction was found between therapeutic methods and time. There were no significant differences in quality of life and psychosocial scores. There were only two treatment failures (manipulation 1; simulated manipulation 1) and no adverse events.

CONCLUSIONS: Active manipulations have more effect than simulated manipulations on pain relief for acute back pain and sciatica with disc protrusion.

2006 - Immediate Effects on Neck Pain and Active Range of Motion After a Single Cervical High-velocity Low-amplitude Manipulation in Subjects Presenting with Mechanical Neck Pain: A Randomized Controlled Trial

J Manipulative Physiol Ther 2006 (Sep);29 (7):511–517 http://www.ncbi.nlm.nih.gov/pubmed/16949939

A group of 70 patients with neck pain (25 males and 45 females, ages 20-55 years) participated in this study. The lateral gliding test was used to establish an intervertebral joint dysfunction at the C3 through C4 or C4 through C5 levels. The

subjects were randomly divided into either an experimental group, which received an HVLA thrust, or a control group, which received manual mobilization. Results suggest that a single cervical HVLA manipulation is more effective in reducing neck pain at rest, and in increasing active cervical range of motion, than a control mobilization procedure in subjects suffering from mechanical neck pain.

2006 - 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):288–296

http://www.ncbi.nlm.nih.gov/pubmed/16690383

A total of 115 patients were contacted, of whom 94 became study participants, resulting in 60 women (64%) and 34 men. The mean age was 39.6 years (SD, 15.7). The mean number of visits was 24.5 (SD, 21.2). Pain levels improved significantly from a mean of 7.6 (median, 8.0) before treatment to 1.9 (median, 2.0) after treatment (P < .0001). The overall patient satisfaction rate was 94%.

2006 - Return to Work after Two Years of Total Disability: A Case Report J Occup Rehabil 2006 (Jun 3):16 (2):247–254

http://www.ncbi.nlm.nih.gov/pubmed/16752089

This paper describes the conservative management of a patient who was disabled from work for 2 years, using an integrated approach including chiropractic manipulation, pain education, restricted duty and clear communications among all parties involved. After 15 weeks, the patient returned to her previous occupation as a nurse, first part time, and subsequently full time.

2006 - Improvement after Chiropractic Care in Cervicocephalic Kinesthetic Sensibility and Subjective Pain Intensity in Patients with Nontraumatic Chronic Neck Pain

J Manipulative Physiol Ther 2006 (Feb);29 (2):100–106 http://www.ncbi.nlm.nih.gov/pubmed/16752089

There was no difference between the treatment patients and the control subjects at the beginning with regard to age, sex, subjective pain intensity, range of motion, and HRA. At the 5-week follow-up, the treatment patients showed significant reductions in pain and improvement of all HRA aspects measured whereas the control subjects did not show any reduction in pain and improvement in only one HRA aspect. The results of this study suggest that chiropractic care can be effective in influencing the complex process of proprioceptive sensibility and pain of cervical origin. Short, specific chiropractic treatment programs with proper patient information may alter the course of chronic cervical pain.

2005 - Treating Chronic Mechanical Spinal Pain Spinal manipulation may provide broader and more significant long-term benefit for chronic spinal pain patients than acupuncture and medication.

J Manipulative Physiol Ther 2005;28(1):3-11. Muller R, Giles LGF. Long-Term Follow-Up of a Randomized Clinical Trial Assessing the Efficacy of Medication, Acupuncture, and Spinal Manipulation for Chronic Mechanical Spinal Pain Syndromes. J Manipulative Physiol Ther 2005;28(1):3-11.

BACKGROUND: Chronic mechanical back pain and neck pain, which are often caused by an injury or disease, present a diagnostic and treatment challenge and pose a signifi cant fi nancial strain on the health care system. Some evidence shows that a multidisciplinary team approach to treating spinal pain results in high patient satisfaction. The evidence about the superiority of a particular treatment for non-specifi c chronic spinal pain is inconclusive.

THE OBJECTIVE: To assess the long-term effect of medication, needle acupuncture and spinal manipulation on treating patients with chronic (> 13 weeks) spinal pain.

THIS STUDY conducted a one-year follow-up of a randomized clinical trial investigating the effectiveness of medication (Celebrex, Vioxx and/or acetaminophen), acupuncture or high-velocity low-amplitude spinal manipulation on treating chronic spinal pain. Sixty-nine patients were randomized into three treatment groups, receiving one type of treatment for nine weeks. The one-year follow-up was conducted through Oswestry Back Pain Index, Neck Disability Index, Short-Form-36 and Visual Analog Scales. The study analyzed the results of treatment of 40 patients who had received only one randomly allocated type of treatment.

RESULTS: Comparison of the initial and long-term follow-up questionnaires produced the following results:

• Only the group receiving spinal manipulation showed long-term treatment benefit, with five of the original seven improvements remaining statistically significant after one year.

• Only one of seven improvements remained statistically significant in each of the acupuncture and the medication treatment groups at follow-up.

CONCLUSION:For treating chronic spinal pain, spinal manipulation, if not contraindicated, may provide broader and more significant long-term benefits than acupuncture or pain-relief medication.

2005 - Long-Term Follow-up of a Randomized Clinical Trial Assessing the Efficacy of Medication, Acupuncture, and Spinal Manipulation for Chronic Mechanical Spinal Pain Syndromes

J Manipulative Physiol Ther 2005 (Jan);28 (1):3-11

http://www.ncbi.nlm.nih.gov/pubmed/15726029

The results of this "fastidious" approach were able to add some information regarding the efficacy of treatment regimens in patients with chronic spinal pain syndromes. Overall, patients who have chronic mechanical spinal pain syndromes and received spinal manipulation gained significant broad-based beneficial short-term and long-term outcomes. For patients receiving acupuncture, consistent improvements were also observed, although without reaching statistical significance (with a single exception). For patients receiving medication, the findings were less favorable. Larger studies are now clearly justified.

2005 - Effects of a Managed Chiropractic Benefit on the Use of Specific Diagnostic and Therapeutic Procedures in the Treatment of Low Back and Neck Pain

J Manipulative Physiol Ther 2005 (Oct);28 (8):564–569 http://www.ncbi.nlm.nih.gov/pubmed/16226623

For the treatment of low back and neck pain, the inclusion of a chiropractic benefit resulted in a significant reduction in the rates of surgery, advanced imaging, inpatient care, and plain-film radiographs. This effect was greater on a per-episode basis than on a per-patient basis.

2005 - Exercises for Mechanical Neck Disorders

Cochrane Database Syst Rev 2005 (Jul 20);3:CD004250 http://www.ncbi.nlm.nih.gov/pubmed/16034925

The evidence summarised in this systematic review indicates that specific exercises may be effective for the treatment of acute and chronic MND, with or without headache. To be of benefit, a stretching and strengthening exercise program should concentrate on the musculature of the cervical, shoulder-thoracic area, or both. A multimodal care approach of exercise, combined with mobilisation or manipulation for subacute and chronic MND with or without headache, reduced pain, improved function, and global perceived effect in the short and long term.

2005 - Determining the Relationship between Cervical Lordosis and Neck Complaints

J Manipulative Physiol Ther 2005 (Mar);28 (3):187-193 http://www.ncbi.nlm.nih.gov/pubmed/15855907

In a study of 277 lateral cervical x-rays, patients with lordosis of 20° or less were more likely to have cervicogenic symptoms (P < .001). The association between cervical pain and lordosis of 0° or less was significant (P < .0001). The odds that a patient with cervical pain had a lordosis of 0° or less was 18 times greater than for a patient with a noncervical complaint. Patients with cervical pain had less lordosis and this was consistent over all age ranges.

2005 - Chronic Pain in Persons with Neuromuscular Disease

Clin J Pain 2005 (Jan); 21 (1):18-26

http://www.chiro.org/ChiroZine/ABSTRACTS/Chronic_Pain_in_Persons.shtml In this paper, researchers in a medical school rehabilitation department were interested in finding out what treatments were most effective at reducing pain for neuromuscular diseases (like amyotrophic lateral sclerosis and myotonic muscular dystrophies). Interestingly, chiropractic scored the highest relief rating (7.33 out of 10), scoring higher than the relief provided by these medical treatments: nerve blocks (6.75) or Opioid analgesics (6.37).

2004 - Dose Response for Chiropractic Care of Chronic Cervicogenic Headache and Associated Neck Pain: A Randomized Pilot Study

J Manipulative Physiol Ther 2004 (Nov);27 (9):547-553

http://www.ncbi.nlm.nih.gov/pubmed/15614241

Patients were randomly allocated to 1, 3, or 4 visits per week for 3 weeks. All patients received high-velocity low-amplitude spinal manipulation. Doctor of Chiropractics could apply up to 2 physical modalities at each visit from among heat and soft tissue therapy. They could also recommend modification of daily activities and rehabilitative exercises. A large clinical trial on the relationship between pain relief and the number of chiropractic treatments is feasible. Findings give preliminary support for the benefit of larger doses, 9 to 12 treatments, of chiropractic care for the treatment of cervicogenic headache.

2004 - Efficacy of Spinal Manipulation and Mobilization for Low Back Pain and Neck Pain: A Systematic Review and Best Evidence Synthesis

Spine Journal (of the North American Spine Society) 2004 (May); 4 (3):335–356 <u>http://www.chiro.org/research/FULL/Efficacy_of_Spinal_Manipulation_and_Mobilizat</u> <u>ion.pdf</u>

Our data synthesis suggests that recommendations can be made with some confidence regarding the use of SMT and/or MOB as a viable option for the treatment of both low back pain and neck pain. There have been few high-quality trials distinguishing between acute and chronic patients, and most are limited to shorter-term follow-up. Future trials should examine well-defined subgroups of patients, further address the value of SMT and MOB for acute patients, establish optimal number of treatment visits and consider the cost-effectiveness of care.

2004 - Chiropractic Management of Intractable Chronic Whiplash Syndrome

Clinical Chiropractic 2004 (Mar):7 (1):16-23

http://www.sciencedirect.com/science/article/pii/S1479235403000750

The management protocol in this case consisted of chiropractic spinal manipulative therapy, soft tissue work and post-isometric relaxation (PIR) techniques to address biomechanical somatic dysfunction. In addition, active rehabilitation exercises, self-stretches and proprioceptive exercises were utilised to address postural and muscle imbalance. On the seventh treatment, the patient reported no neck pain, no headaches and unrestricted cervical spine range of motion. At 4 months follow-up, the patient continued to be free of headaches and neck stiffness and reported only mild, intermittent neck pain.

2004 - 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.

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Abstract

BACKGROUND CONTEXT: Despite the many published randomized clinical trials (RCTs), a substantial number of reviews and several national clinical guidelines,

'much controversy still remains regarding the evidence for or against efficacy of spinal manipulation for low back pain and neck pain.

PURPOSE:To reassess the efficacy of spinal manipulative therapy (SMT) and mobilization (MOB) for the management of low back pain (LBP) and neck pain (NP), with special attention to applying more stringent criteria for study admissibility into evidence and for isolating the effect of SMT and/or MOB.

STUDY DESIGN:RCTs including 10 or more subjects per group receiving SMT or MOB and using patient-oriented primary outcome measures (eg, patient-rated pain, disability, global improvement and recovery time).

METHODS:Articles in English, Danish, Swedish, Norwegian and Dutch reporting on randomized trials were identified by a comprehensive search of computerized and bibliographic literature databases up to the end of 2002. Two reviewers independently abstracted data and assessed study quality according to eight explicit criteria. A best evidence synthesis incorporating explicit, detailed information about outcome measures and interventions was used to evaluate treatment efficacy. The strength of evidence was assessed by a classification system that incorporated study validity and statistical significance of study results. Sixty-nine RCTs met the study selection criteria and were reviewed and assigned validity scores varying from 6 to 81 on a scale of 0 to 100. Forty-three RCTs met the admissibility criteria for evidence.

RESULTS:Acute LBP: There is moderate evidence that SMT provides more shortterm pain relief than MOB and detuned diathermy, and limited evidence of faster recovery than a commonly used physical therapy treatment strategy.

Chronic LBP: There is moderate evidence that SMT has an effect similar to an efficacious prescription nonsteroidal anti-inflammatory drug, SMT/MOB is effective in the short term when compared with placebo and general practitioner care, and in the long term compared to physical therapy. There is limited to moderate evidence that SMT is better than physical therapy and home back exercise in both the short and long term. There is limited evidence that SMT is superior to sham SMT in the short term and superior to chemonucleolysis for disc herniation in the short term. However, there is also limited evidence that MOB is inferior to back exercise after disc herniation surgery. Mix of acute and chronic LBP: SMT/MOB provides either similar or better pain outcomes in the short and long term when compared with placebo and with other treatments, such as McKenzie therapy, medical care, management by physical therapists, soft tissue treatment and back school. Acute NP: There are few studies, and the evidence is currently inconclusive. Chronic NP: There is moderate evidence that SMT/MOB is superior to general practitioner management for short-term pain reduction but that SMT offers at most similar pain relief to high-technology rehabilitative exercise in the short and long term. Mix of acute and chronic NP: The overall evidence is not clear. There is moderate evidence that MOB is superior to physical therapy and family physician care, and similar to SMT in both the short and long term. There is limited evidence that SMT, in both the short and long term, is inferior to physical therapy.

CONCLUSIONS:Our data synthesis suggests that recommendations can be made with some confidence regarding the use of SMT and/or MOB as a viable option for the treatment of both low back pain and NP. There have been few high-quality trials

distinguishing between acute and chronic patients, and most are limited to shorterterm follow-up. Future trials should examine well-defined subgroups of patients, further address the value of SMT and MOB for acute patients, establish optimal number of treatment visits and consider the cost-effectiveness of care.

2003 - Chronic Spinal Pain: A Randomized Clinical Trial Comparing Medication, Acupuncture, and Spinal Manipulation

Spine (Phila Pa 1976) 2003 (Jul 15); 28 (14):1490–1502 http://www.ncbi.nlm.nih.gov/pubmed/12865832

The highest proportion of early (asymptomatic status) recovery was found for manipulation (27.3%), followed by acupuncture (9.4%) and medication (3%). Manipulation achieved the best overall results, with improvements of 50% (P = 0.01) on the Oswestry scale, 38% (P = 0.08) on the NDI, 47% (P < 0.001) on the SF-36, and 50% (P < 0.01) on the VAS for back pain, 38% (P < 0.001) for lumbar standing flexion, 20% (P < 0.001) for lumbar sitting flexion, 23% (P = 0.1) for cervical sitting flexion, and 18% (P = 0.02) for cervical sitting extension.

2003 - Cost Effectiveness of Physiotherapy, Manual Therapy, and General Practitioner Care for Neck Pain: Economic Evaluation Alongside a Randomised Controlled Trial

http://www.bmj.com/content/326/7395/911.full

British Medical Journal 2003 (Apr 26);326 (7395):911

A hands-on approach to treating neck pain by manual therapy may help people get better faster and at a lower cost than more traditional treatments, according to this study. After seven and 26 weeks, they found significant improvements in recovery rates in the manual therapy group compared to the other 2 groups. For example, at week seven, 68% of the manual therapy group had recovered from their neck pain vs. 51% in the physical therapy group and 36% in the medical care group.

2003 - Chronic spinal pain - a randomized clinical trial comparing medication, acupuncture, and spinal manipulation.

Giles LGF, Muller R.

Spine 2003;28:1490-1503.

A randomized, controlled clinical trial published in Spine reveals that chiropractic manipulation (adjustment) is superior to both drugs and acupuncture in the treatment of chronic spinal pain (people with pain lasting more than 13 weeks). The study, conducted at a multidisciplinary spinal pain outpatient unit in an Australian public hospital, involved 115 patients randomly assigned to receive one of three interventions: medication, needle acupuncture or chiropractic manipulation.

Patients randomized to the acupuncture or spinal manipulation group were given an initial physical examination by the treating clinician to determine which form of acupuncture needle placement and needling would take place, or what type of spinal manipulation would be performed, respectively. Patients randomized to the medication group were given Celebrex, unless the patient had used it previously. The next drug of choice was Vioxx, followed by paracetamol (up to 4g/day). Doses were left to the sports physician's discretion. Chiropractic patients were given two treatments per week.

The patients were assessed four times: at the initial visit, and two, five and nine weeks after the initial treatment. While a number of patients didn't finish the study, due to noncompliance or treatment changes, the statistical significance of the results was maintained for most outcomes. At the end of the study, the group receiving manipulation experienced the most recovered patients (9) compared with three for the acupuncture group and only two for the medication group. This was significant, considering the nature of chronic spine pain.

One of the study's most remarkable findings was that patients in the manipulation group reported a 47 percent improvement on a general overall health questionnaire, compared to only 15 percent for the acupuncture group and 18 percent for the medication group.

2002 - Two-year Follow-up of a Randomized Clinical Trial of Spinal Manipulation and Two Types of Exercise for Patients with Chronic Neck Pain

Spine 2002 (Nov 1);27 (21):2383-2389

http://www.ncbi.nlm.nih.gov/pubmed/12438988

The results of this study demonstrate an advantage of spinal manipulation combined with low-tech rehabilitative exercise and MedX rehabilitative exercise versus spinal manipulation alone over two years and are similar in magnitude to those observed after one-year follow-up. These results suggest that treatments including supervised rehabilitative exercise should be considered for chronic neck pain sufferers. Further studies are needed to examine the cost effectiveness of these therapies and how spinal manipulation compares to no treatment or minimal intervention.

2002 - Manual Therapy, Physical Therapy, or Continued Care by a General Practitioner for Patients with Neck Pain. A Randomized, Controlled Trial

Ann Intern Med 2002 (May 21);136 (10):713-722 http://www.ncbi.nlm.nih.gov/pubmed/12020139

Neck pain is a common problem, but the effectiveness of frequently applied conservative therapies has never been directly compared. In this study, manual therapy was a favorable treatment option for patients with neck pain compared with physical therapy or continued care by a general practitioner.

2001 - A Pilot Randomized Clinical Trial on the Relative Effect of Instrumental (MFMA) Versus Manual (HVLA) Manipulation in the Treatment of Cervical Spine Dysfunction

J Manipulative Physiol Ther 2001 (May);24 (4):260–271 http://www.ncbi.nlm.nih.gov/pubmed/11353937

The results of this clinical trial indicate that both instrumental (MFMA) manipulation and manual (HVLA) manipulation have beneficial effects associated with reducing pain and disability and improving cervical range of motion in this patient population. A randomized, controlled clinical trial in a similar patient base with a larger sample size is necessary to verify the clinical relevance of these findings.

F) Non-Musculoskeletal conditions

Asthma:

2010 - Chiropractic Care for Patients with Asthma: A Systematic Review of the Literature

J Can Chiropr Assoc. 2010 (Mar);54 (1):24-32

http://www.jcca-online.org/ecms.ashx/PDF/2010/2010-1/jcca-v54-1-024indd.pdf Results of the eight retrieved studies indicated that chiropractic care showed improvements in subjective measures and, to a lesser degree objective measures, none of which were statistically significant. It is evident that some asthmatic patients may benefit from this treatment approach; however, at this time, the evidence suggests chiropractic care should be used as an adjunct, not a replacement, to traditional medical therapy

2009 - Chiropractic Care of a Pediatric Patient with Asthma, Allergies, Chronic Colds & Vertebral Subluxation

Journal of Pediatric, Maternal & Family Health - Chiropractic 2009;3:1–7 <u>http://www.chiro.org/research/ABSTRACTS/Chiropractic_Care_of_a_Pediatric_Patie</u> <u>nt.shtml</u>

A 7-year-old male was presented by his parents for chiropractic evaluation and possible care. The patient suffered from chronic colds, allergies, and asthma since the age of 5 months. At the time of initial evaluation, the patient was on a 1x/day dose of prescription Alavert for allergies and Albuterol for asthma. The patient was cared for using specific, low-force adjustments with the Activator Instrument to address areas of vertebral subluxation in the cervical, thoracic, and lumbosacral spine. Within two weeks of initiating chiropractic care, the patient was able to discontinue his allergy and asthma medications (as decided upon by his parents) and the use of his nebulizer.

2005 - Chiropractic Co-management of Medically Treated Asthma Clinical Chiropractic 2005 (Sep); 8 (3):140–144

http://www.sciencedirect.com/science/article/pii/S1479235405000453

This article presents three cases where patients, being treated by conventional pharmacological means, had chiropractic manipulation administered to the upper thoracic spine twice a week for a period of 6 weeks. Objective measurements were collected using a peak flow meter and subjective data using an asthma specific questionnaire. All three cases resulted in increased subjective and objective parameters and suggest the need for larger studies with appropriate methodology.

2005 - Self-reported Nonmusculoskeletal Responses to Chiropractic Intervention: A Multi-nation Survey

J Manipulative Physiol Ther 2005 (Jun);28 (5):294-302

http://www.ncbi.nlm.nih.gov/pubmed/15965403

Positive reactions were reported by 2% to 10% of all patients and by 3% to 27% of those who reported to have such problems. Most common were improved breathing (27%), digestion (26%), and circulation (21%).

2002 - Spinal Manipulation May Benefit Asthma Patients Foundation for

Chiropractic Education and Research (FCER)

http://www.chiro.org/research/ABSTRACTS/Manipulation_May_Benefit_Asthma.sht ml

Patients afflicted with asthma may benefit from spinal manipulation in terms of symptoms, immunological capacity, and endocrine effects, an audience was told on October 5 at the 9th International Conference on Spinal Manipulation in Toronto. The investigative team, headed by Ray Hayek, Ph.D., has been conducting a trial at 16 treatment centers in Australia involving 420 patients with an average age of 46 in an effort to find out what effects spinal manipulation has on symptoms, depression and anxiety, general health status, and the levels of immunity as reflected by the concentrations of both an immunoglobulin (IgA) and an immunosuppressant (cortisol).

2001 - Chronic Pediatric Asthma and Chiropractic Spinal Manipulation: A Prospective Clinical Series and Randomized Clinical Pilot Study

J Manipulative Physiol Ther 2001 (Jul); 24 (6): 369–377 http://www.ncbi.nlm.nih.gov/pubmed/11514813

After 3 months of combining chiropractic SMT with optimal medical management for pediatric asthma, the children rated their quality of life substantially higher and their asthma severity substantially lower. These improvements were maintained at the 1-year follow-up assessment.

http://www.chiro.org/research/FULL/Chronic_pediatric_asthma_LETTER.html

2000 - Chiropractic Management of 47 Asthma Cases

Todays Chiropractic 2000(Nov)

http://www.erinelster.com/articles.aspx?ArticleID=271

Over a seven-year period, 47 cases of asthma were managed in an outpatient setting. Every case was followed for a minimum of two years to observe effectiveness of care. The study group comprised 28 males and 19 females, ranging from 7 to 42 years of age. Of the 47 cases, 32 patients ranged in age from 7 to 19 years.

Blood Pressure

Current Research:

2001 - Significant Changes in Systolic Blood Pressure Post Vectored Upper Cervical Adjustment vs. Resting Control Groups: A Possible Effect of the Cervicosympathetic and/or Pressor Reflex J Manipulative Physiol Ther 2001 (Feb); 24 (2):101–109 http://www.ncbi.nlm.nih.gov/pubmed/11208222

The results indicate that palpation and vectored atlas adjustment causes a significant decrease in systolic blood pressure in patients with putative upper cervical subluxation/joint dysfunction in comparison with resting controls. Similar results were also demonstrated when subjects acted as their own controls. The lack of randomization, blinding, and a manipulated control group are factors that weaken these findings. The sudden drop in systolic pressure is proposed to be due to stimulation of the cervicosympathetic reflex or moderation of muscle tone and elimination of the effects of the pressor reflex.

2002 - Practice-based Randomized Controlled-comparison Clinical Trial of Chiropractic Adjustments and Brief Massage Treatment at Sites of Subluxation in Subjects with Essential Hypertension: Pilot Study

J Manipulative Physiol Ther 2002 (May);25 (4):221–239 http://www.ncbi.nlm.nih.gov/pubmed/12021741

This pilot study elucidated several procedural issues that should be addressed before undertaking a full-scale clinical trial on the effects of chiropractic adjustments in patients with essential hypertension. A multidisciplinary approach to recruitment may need to be used in any future efforts because of the limited subject pool of patients who have hypertensive disease but are not taking medications for its control. Measures need to be used to assure comparable groups regarding prognostic variables such as weight. Studies such as these demonstrate the feasibility of conducting a full-scale 3-group randomized clinical trial in the private practice setting.

2007 - Atlas Vertebra Realignment and Achievement of Arterial Pressure Goal in Hypertensive Patients: A Pilot Study

Journal of Human Hypertension 2007 (May); 21 (5): 347–352 http://www.nuccra.org/themes/nuccra/images_new/pdf/Hypertension2007.pdf Anatomical abnormalities of the cervical spine at the level of the Atlas vertebra are associated with relative ischaemia of the brainstem circulation and increased blood pressure (BP). Manual correction of this mal-alignment has been associated with reduced arterial pressure. Using a double blind, placebo-controlled design at a single center, 50 drug naive (n=26) or washed out (n=24) patients with Stage 1 hypertension were randomized to receive a National Upper Cervical Chiropractic (NUCCA) procedure or a sham procedure. Patients received no antihypertensive meds during the 8-week study duration. The primary end point was changed in systolic and diastolic BP comparing baseline and week 8, with a 90% power to detect an 8/5 mm Hg difference at week 8 over the placebo group. The study cohort had a mean age 52.7+/-9.6 years, consisted of 70% males. At week 8, there were differences in systolic BP (-17+/-9 mm Hg, NUCCA versus -3+/-11 mm Hg, placebo; P<0.0001) and diastolic BP (-10+/-11 mm Hg, NUCCA versus -2+/-7 mm Hg; P=0.002). No adverse effects were recorded. We conclude that restoration of Atlas alignment is associated with marked and sustained reductions in BP similar to the use of two-drug combination therapy.

2008 - Sympathetic and Parasympathetic Responses to Specific Diversified Adjustments to Chiropractic Vertebral Subluxations of the Cervical and Thoracic Spine

J Chiropr Med. 2008 (Sep); 7 (3): 86–93 http://www.ncbi.nlm.nih.gov/pubmed/19646369

Diastolic pressure (indicating a sympathetic response) dropped significantly postadjustment among those receiving cervical adjustments, accompanied by a moderate clinical effect (0.50). Pulse pressure increased significantly among those receiving cervical adjustments, accompanied by a large effect size (0.82). It is preliminarily suggested that cervical adjustments may result in parasympathetic responses, whereas thoracic adjustments result in sympathetic responses. Furthermore, it appears that these responses may demonstrate the relationship of autonomic responses in association to the particular segment(s) adjusted.

Scoliosis

2011 - Four-Year Follow-Up of a Patient Undergoing Chiropractic Rehabilitation for Adolescent Idiopathic Scoliosis

Journal of Pediatric, Maternal & Family Health - Chiropractic 2011;2:54-58 http://chiropracticpediatricresearch.web.officelive.com/2011_1120_scoliosis.aspx A 14 year old female with adolescent idiopathic scoliosis presented to a private chiropractic rehabilitation clinic for care. She had complaints of mild thoracic and right sacroiliac pain which worsened during prolonged sitting or while running long distances. Her scoliosis measured 24° in the thoracic spine and 17° in the lumbar spine. Abnormalities in chest expansion and axial trunk rotation were also observed and recorded. Patient participated in a multimodal chiropractic rehabilitation program consisting of 28 clinic visits over 17 months. She also committed to a specific home exercise program. After 17 months, her curvatures decreased to 15°/6°, while showing concomitant improvements in peak expiratory flow, axial trunk rotation, and chest expansion. These outcome measures further improved at follow-up after 4 years with the Cobb angles reducing to 12°/4° respectively.

2004 - Scoliosis Treatment Using a Combination of Manipulative and Rehabilitative Therapy: A Retrospective Case Series

BMC Musculoskeletal Disorders 2004 (Sep 14); 5: 32 http://www.biomedcentral.com/1471-2474/5/32#IDA1QZ2H The combined use of spinal manipulation and postural therapy appeared to significantly reduce the severity of the Cobb angle in all 19 subjects. These results warrant further testing of this protocol.

Headache

Current Research

2012 - Manual Therapies for Migraine: A Systematic Review J Headache Pain. 2011 (Feb 5) [Epub ahead of print]

http://www.springerlink.com/content/a41rw34473125167/fulltext.html

Migraine occurs in about 15% of the general population. Migraine is usually managed by medication, but some patients do not tolerate migraine medication due to side effects or prefer to avoid medication for other reasons. Non-pharmacological management is an alternative treatment option. We systematically reviewed randomized clinical trials (RCTs) on manual therapies for migraine. The RCTs suggest that massage therapy, physiotherapy, relaxation and chiropractic spinal manipulative therapy might be equally effective as propranolol and topiramate in the prophylactic management of migraine. However, the evaluated RCTs had many methodological shortcomings

2011 - Manual Therapies for Migraine: A Systematic Review

http://www.springerlink.com/content/a41rw34473125167/fulltext.html J Headache Pain. 2011 (Apr);12 (2):127–133

Migraine occurs in about 15% of the general population. Migraine is usually managed by medication, but some patients do not tolerate migraine medication due to side effects or prefer to avoid medication for other reasons. Non-pharmacological management is an alternative treatment option. We systematically reviewed randomized clinical trials (RCTs) on manual therapies for migraine. The RCTs suggest that massage therapy, physiotherapy, relaxation and chiropractic spinal manipulative therapy might be equally effective as propranolol and topiramate in the prophylactic management of migraine. However, the evaluated RCTs had many methodological shortcomings.

2010 - Dose Response and Efficacy of Spinal Manipulation for Chronic Cervicogenic Headache: A Pilot Randomized Controlled Trial

The Spine Journal 2010 (Feb): 10 (2): 117-128

http://www.studiomazzini.net/pdf/WIpyWL-sdarticle.pdf

Eighty patients with chronic cervicogenic headache (CGH) were randomized to receive either 8 or 16 treatment sessions with either chiropractic care (Spinal Manipulation or SMT) or a minimal light massage (LM) as the control group. Both SMT groups improved much more than the control groups, with greater improvements in the group that received more care.

2009 - Intractable Migraine Headaches during Pregnancy Under Chiropractic Care

Complementary Therapies in Clinical Practice 2009 (Nov);15 (4):192–7 http://www.ncbi.nlm.nih.gov/pubmed/19880080

The absence of hormone fluctuations and/or the analgesic effects of increased betaendorphins are thought to confer improvements in headache symptoms during pregnancy. However, for a number of pregnant patients, they continue to suffer or have worsening headache symptoms. The use of pharmacotherapy for palliative care is a concern for both the mother and the developing fetus and alternative/complementary care options are sought. We present a 24-year-old gravid female with chronic migraine headaches since age 12years. Previous unsuccessful care included osteopathy, physical therapy, massage and medication. Non-steroidal anti-inflammatory medication with codeine provided minor and temporary relief. Chiropractic care involving spinal manipulative therapy (SMT) and adjunctive therapies resulted in symptom improvement and independence from medication. This document provides supporting evidence on the safety and possible effectiveness of chiropractic care for patients with headaches during pregnancy.

2004 - Non-invasive Physical Treatments for Chronic/Recurrent Headache

Cochrane Database Syst Review 2004; (3): CD001878 http://www.ncbi.nlm.nih.gov/pubmed/15266458

For the prophylactic treatment of migraine headache, there is evidence that spinal manipulation may be an effective treatment option with a short-term effect similar to that of a commonly used, effective drug (amitriptyline). For the prophylactic treatment of chronic tension-type headache, amitriptyline is more effective than spinal manipulation during treatment. However, spinal manipulation is superior in the short term after cessation of both treatments. For the prophylactic treatment of cervicogenic headache, there is evidence that both neck exercise (low-intensity endurance training) and spinal manipulation are effective in the short and long term when compared to no treatment. There is also evidence that spinal manipulation is effective in the short term when compared to massage or placebo spinal manipulation, and weaker evidence when compared to spinal mobilization.

2002 - A Randomized Controlled Trial of Exercise and Manipulative Therapy for Cervicogenic Headache

SPINE (Phila Pa 1976) 2002 (Sep 1);27 (17):1835—1843 http://www.ncbi.nlm.nih.gov/pubmed/12221344 Manipulative therapy and exercise can reduce the symptoms of cervicogenic headache, and the effects are maintained.

2001 - Efficacy of Spinal Manipulation for Chronic Headache: A Systematic Review

J Manipulative Physiol Ther 2001 (Sep);24 (7):457–466 http://www.ncbi.nlm.nih.gov/pubmed/11562654

SMT appears to have a better effect than massage for cervicogenic headache. It also appears that SMT has an effect comparable to commonly used first-line prophylactic prescription medications for tension-type headache and migraine headache.

2000 - Randomized Controlled Trial of Chiropractic Spinal Manipulative Therapy for Migraine

J Manipulative Physiol Ther 2000 (Feb);23 (2):91–95 http://www.ncbi.nlm.nih.gov/pubmed/10714533

The results of this study support previous results showing that some people report significant improvement in migraines after chiropractic SMT. A high percentage (>80%) of participants reported stress as a major factor for their migraines. It

appears probable that chiropractic care has an effect on the physical conditions related to stress and that in these people the effects of the migraine are reduced.

G) Education

Chiropractic Education vs. Medical Education

How much education does a chiropractic doctor have? The facts may surprise. Educational requirements for doctors of chiropractic are among the most stringent of any of the health care professions.Today, highly specialized training is required to graduate and earn licensure. Chiropractic school is quite similar to that of medical school, especially during the first 2 years of the 4 year program.

A Chiropractic program consists of 4 academic years of professional education after completion of a 4 year undergraduate degree. Chiropractic education averages a total of 4,822 hours, ranging from 4,400 hours to 5,220 hours in the 16 colleges. This includes an average of 1,975 hours in clinical sciences and 1,045 hours of clinical clerkship. The minimum hours for accreditation by the Council on Chiropractic Education is 4,200 hours. Chiropractic doctors are well trained to refer to other health care providers when clinically necessary. It is for this reason that a chiropractor's training includes courses such as Cardiology, Gastroenterology, Obstetrics, Gynecology, and Pathology amongst others.

In comparing the curricula of these two professions into subjects and how much is taught, note that they are relatively similar in total student contact hours: an average of 4,822 hours in chiropractic schools compared with 4,667 hours in medical schools (Coulter, et al, submitted). Basic science comprises 25-30 percent of the total contact hours in both the chiropractic and medical programs and the two programs have roughly similar contact hours in Biochemistry, Microbiology, and Pathology. Chiropractors receive substantially more hours in Anatomy education and Physiology but many fewer hours in public health.

Subjects	Class Hours Chiropractic Students	Class Hours Medical Students
Anatomy	540	510
Chemistry	165	325
Diagnosis	630	325
Microbiology	120	115
Neurology	320	110
Obstetrics	60	150
Orthopedics	210	155
Pathology	360	400
Physiology	240	325
Psychiatry	60	145
Radiology	360	360
HOURS	3,065	3,065
Additionally Required Studies	Spinal Manipulation Nutrition	Pharmacology Immunology
	Physiotherapy Advanced Radiology	General Surgery
TOTAL HOURS	4,485	4,250

Comparisons of the Overall Curriculum Structure for Chiropractic and Medical Schools

	Chiropractic Schools		Medical Schools	
	Mean	Percentage	Mean	Percentage
Total Contact Hours	4822	100%	4667	100%
Basic Science Hours	1416	29%	1200	26%
Clinical Science Hours	3406	71%	3467	74%
Chiropractic Science Hours	1975	41%	0	0%
Clerkship Hours	1405	29%	3467	74%

Source: Center for Studies in Health Policy, Inc., Washington, DC. Personal communication of 1995 unpublished data from Meredith Gonyea, PhD.

National University Chiropractic Medicine Program Trimester-by-Trimester Curriculum Total Program Credits: 248

This is a 4-term Phase I schedule. Term One (Trimester 1)

Course	23.5 Total Credits
AN5101	Spine and Extremities Anatomy
AN5102	Spine and Extremities Anatomy Lab
AN5107	Histology and Embryology I
PH5103	Cellular Physiology and Hematology
BC5104	Human Biochemistry
BC5105	Clinical Biochemistry
FH5106	Fundamentals of Natural Medicine and Historical Perspectives

Term Two (Trimester 2)

Course	26.5 Total Credits
AN5201	Head and Neck Anatomy
AN5202	Head and Neck Anatomy Lab
AN5203	Neuroanatomy
PH5204	Fundamentals of Pathology
MI5205	Fundamentals of Public Health
RA5206	Normal Radiographic Anatomy and Variants
EM5207	Evaluation and Management of the Chest and Thoracic Spine
PH5208	Neurophysiology
BU5209	Introduction to Business Principles

Term Three (Trimester 3)

Course	26.0 Total Credits
AN5304	Thorax, Abdomen and Pelvis Anatomy
AN5305	Thorax, Abdomen and Pelvis Anatomy Lab
AN5307	Histology and Embryology II
PH5306	Neuroendocrinology, GI and Reproductive Physiology

PA5302	Systems Pathology I
MI5303	Medical Microbiology I
BC5308	Nutritional Biochemistry
EM5309	Evaluation and Management of the Abdomen, Pelvis and Lumbar Spine
FH5310	Whole Health Concepts and Philosophical Perspectives

Term Four (Trimester 4)

Course	27.0 Total Credits
GE5404	Medical Genomics
PH5405	Cardiovascular, Respiratory and Renal Physiology
PA5402	Systems Pathology II
MI5403	Medical Microbiology II
NN5406	Science of <u>Diet</u> and Nutrition
RA5407	Radiation Physics and Technology
EM5408	Evaluation and Management of the Head, Neck and Cervical Spine
EP5401	Evidence Based Practice II: Critical Appraisal of the Biomedical Literature

This is a 4-term Phase II schedule. This phase may also be completed in 5 or 6 terms.

Term One (Trimester 5)

Course	27.0 Total Credits
EM6101	Evaluation and Management of the Extremities
EM6102	Evaluation and Management of the Musculoskeletal System
EM6103	Evaluation and Management of the GI/GU and Reproductive Systems
EM6104	Evaluation and Management of the Cardiovascular and Respiratory Systems
EM6105	Evaluation and Management of the EENT
EM6106	Evaluation and Management of the Neurological System
NN6107	Pharmacology I
NN6108	Botanical Medicine I

Term Two (Trimester 6)

The Clinical Encounter
Principles of Marketing and Communication
Physical and Laboratory Diagnosis
Fundamentals of Imaging: Arthritides and Trauma
Functional <u>Rehabilitation</u> - Exercise Prescription
Fundamentals of Imaging: Tumors
Pharmacology II
Pediatrics, Geriatrics and Female Health Issues
Orthopedic Musculoskeletal Imaging
Advanced Manual Therapy Techniques I
I I I I I

Term Three (Trimester 7)

Course	28.0 Total Credits
NN6301	Clinical Nutrition

RA6302	Fundamentals of Imaging: Chest and Abdomen
EC6303	Ambulatory Trauma Care
EM6304	Advanced Diagnosis and Problem Solving
EM6305	Psychopathology and Health Psychology
BU6306	Business Planning
FR6307	Physiological Therapeutics - Modalities
NN6308	Botanical Medicine II
FR6309	Functional Rehabilitation - Advanced Manual Medicine
MM6310	Advanced Manual Therapy Techniques II
MM6311	Comparative Techniques and Listing Systems

Term Four (Trimester 8)

Course	28.0 Total Credits
EP6401	Evidence Based Practice: Applied EBP
CL6402	Student Clinic
EM6403	Clinical Natural Medicine
BU6404	Ethical Management of the Chiropractic Practice
EM6405	Doctor-Patient Relationship
EM6406	Dermatology
BU6407	Jurisprudence and Ethics
RA6408	Report Writing and Advanced Imaging
RA6409	Radiographic Positioning and radiology Management
Elective	Elective Course Choices
This is a 2-term Phase III schedule. Term One (Trimester 9)	
Course	17.5 Total Credits

Term Two (Trimester 10)

EP7101

IC7102

Course	17.0 Total Credits
IC7201	Clinic Internship II

Evidence Based Practice: Journal Club

Clinic Internship I

Doctors of chiropractic — who are licensed to practice in all 50 states, the District of Columbia, and in many nations around the world — undergo a rigorous education in the healing sciences, similar to that of medical doctors. In some areas, such as anatomy, physiology, and rehabilitation, they receive more intensive education than most medical doctors or physical therapists.

Before they are allowed to practice, doctors of chiropractic must pass national board examinations and become state-licensed. Chiropractic colleges also offer post-graduate continuing education programs in specialty fields ranging from sports injuries and occupational health to orthopedics and neurology. These programs allow chiropractors to specialize in a healthcare discipline or meet state re-licensure requirements. This extensive education prepares doctors of chiropractic to diagnose health care problems, treat the problems when they are within their scope of practice and refer patients to other health care practitioners when appropriate.

H) Deficiencies in Medical Musculoskeletal Education

A survey of family practice physicians found 51 percent of respondents felt that they had insufficient training in orthopaedics. Furthermore, 56 percent of those surveyed claimed that medical school was their only source for formal musculoskeletal training (MSK). Similarly, in another study, pediatric residents said they had the least adequate training in orthopaedics. Graduating family practice residents felt significantly more confident in performing physical exams, evaluating radiographs, and diagnosing and treating non-MSK disorders than they did for MSK conditions.

2009 - Doctors Likely to Encounter Children With Musculoskeletal Complaints Have Low Confidence in Their Clinical Skills

The Journal of Pediatrics 2009 (Feb);154 (2):267–271

http://www.ncbi.nlm.nih.gov/pubmed/18823907

Questionnaires, filled out by a broad spectrum of medical providers in England [Primary Care (n = 75), Pediatrics (n = 39), Emergency (n = 39), Orthopedics (n = 40), and experienced doctors in Primary Care (n = 93), and Pediatrics (n = 60).], revealed that 74% of them scored their personal confidence in pediatric musculoskeletal clinical assessment as "no" to "low".

2009 - Orthopaedists' and Family Practitioners' Knowledge of Simple Low Back Pain Management

Spine 2009 (Jul 1);34 (15):1600-1603

http://www.chiro.org/ChiroZine/ABSTRACTS/Orthopaedists_and_Family_Practitione rs.shtml

One hundred forty family practitioners and 253 orthopaedists responded to the questionnaire. The mean family practitioners' score (69.7) was significantly higher than the orthopaedists' score (44.3) (P < 0.0001). No relation was found between the results and physician demographic factors, including seniority. Most orthopaedists incorrectly responded that they would send their patients for radiologic evaluations. They would also preferentially prescribe cyclo-oxygenase-2-specific nonsteroidal anti-inflammatory drugs, despite the guidelines recommendations to use paracetamol or nonspecific nonsteroidal anti-inflammatory drugs.

2009 - The Inadequacy of Musculoskeletal Knowledge After Foundation Training in the United Kingdom

Journal of Bone and Joint Surgery Br 2009 (Nov);91 (11):1413–1418 http://www.ncbi.nlm.nih.gov/pubmed/19880882

The aim of this study was to determine whether the foundation programme for junior doctors, implemented across the United Kingdom in 2005, provides adequate

training in musculoskeletal medicine. We recruited 112 doctors on completion of their foundation programme and assessed them using the Freedman and Bernstein musculoskeletal examination tool. Only 8.9% passed the assessment.

References:

1. Musculoskeletal conditions in the United States. Rosemont, IL, American Academy of Orthopaedic Surgeons, 1999

2. Burden of major musculoskeletal conditions Bull World Health Organ 2003; 81(9): 646-656

3. Musculoskeletal Curricula in Medical Education Physician and Sportsmedicine 2004 (Nov); 32 (11)

2005 - Adequacy of Education in Musculoskeletal Medicine

Journal of Bone and Joint Surgery Am 2005 (Feb);87 (2):310–314 http://www.chiro.org/ChiroZine/ABSTRACTS/Adequacy_of_Education.shtml In this study, 334 medical students, residents and staff physicians, specializing in various fields of medicine, were asked to take a basic cognitive examination consisting of 25 short-answer questions - the same type of test administered in the original JBJS 1998 study. The average score among medical doctors, students and residents who took the exam in 2005 was 2.7 points <u>lower</u> than those who took the exam in 1998. Just over half of the staff physicians (52%) scored a passing grade or higher on the 2005 exam. Only 21% of the residents registered a passing grade, and only 5% of the medical students passed the exam. Overall, Seventy-nine percent of the participants failed the basic musculoskeletal cognitive examination.

2005 - More Evidence of Educational Inadequacies in Musculoskeletal Medicine

Clin Orthop Relat Res 2005 (Aug);(437):251–259 http://www.ncbi.nlm.nih.gov/pubmed/16056057

A modified version of an exam used to assess the competency of incoming interns at the University of Pennsylvania was used to assess the competency of medical students during various stages of their training at the University of Washington. Despite generally improved levels of competency with each year at medical school, less than 50% of fourth-year students showed competency. These results suggested that the curricular approach toward teaching musculoskeletal medicine at this medical school was insufficient and that competency increased when learning was reinforced during the clinical years.

2004 - Musculoskeletal Curricula in Medical Education

Physician and Sportsmedicine 2004 (Nov);32 (11)

http://www.chiro.org/ChiroZine/ABSTRACTS/Musculoskeletal_Knowledge.shtml

It's 8:00 pm on a Monday night. Just as you're getting ready to put your 5-year-old son to bed, he falls from a chair, landing on his wrist. It quickly swells, requiring a visit to a nearby urgent care clinic. At the clinic, a pleasant young resident takes a history, performs a physical exam, and orders an x-ray to evaluate the injury. You are told that nothing is broken, and a wrist splint is placed. The following day,

however, you receive a phone call from the clinic informing you that upon further review of the radiographs, a fracture was detected, and your son will need a cast for definitive treatment. This scenario, while fictitious, is not unusual. According to

some studies, up to 10% of wrist fractures are missed at the initial evaluation. While pediatric fractures are often difficult to detect, this example highlights a problem that continues to plague medical education: inadequate instruction in musculoskeletal medicine in both medical school <u>and</u> residency training.

2002 - Musculoskeletal Knowledge: How Do You Stack Up?

Physician and Sportsmedicine 2002 (Aug);30 (8) http://www.chiro.org/ChiroZine/ABSTRACTS/Musculoskeletal_Knowledge.shtml One of every 4 or 5 primary care visits is for a musculoskeletal problem. Yet undergraduate and graduate training for this burden of illness continues to constitute typically less than 5% of the medical curriculum. This is an area of clear concern, but also one in which sports medicine practitioners can assume leadership.

2002 - Educational Deficiencies in Musculoskeletal Medicine

Journal of Bone and Joint Surgery 2002 (Apr);84–A (4):604–608 http://www.jbjs.org/article.aspx?Volume=84&page=604

Four years later, according to the standard suggested by the program directors of internal medicine residency departments, a large majority of the examinees once again failed to demonstrate basic competency in musculoskeletal medicine on the examination. It is therefore reasonable to conclude that medical school preparation in musculoskeletal medicine is inadequate.

2001 - Educating Medical Students About Musculoskeletal Problems: Are Community Needs Reflected in the Curricula of Canadian Medical Schools? Journal of Bone and Joint Surgery 2001 (Sept);83-A (9):1317–1320

http://www.jbjs.org/article.aspx?Volume=83&page=1317

Musculoskeletal problems are a common reason why patients present for medical treatment. The purpose of the present study was to review the curricula of Canadian medical schools to determine whether they prepare their students for the demands of practice with respect to musculoskeletal problems. The curriculum analysis revealed that, on the average, medical schools in Canada devoted 2.26% (range, 0.61% to 4.81%) of their curriculum time to musculoskeletal education. Our literature review and survey of local family physicians revealed that between 13.7% and 27.8% of North American patients presenting to a primary care physician have a chief symptom that is directly related to the musculoskeletal system. (So they conclude:) There is a marked discrepancy between the musculoskeletal knowledge and skill requirements of a primary care physician and the time devoted to musculoskeletal education in Canadian medical schools.

2001 - A Comparison of Chiropractic Student Knowledge Versus Medical Residents

Proceedings of the World Federation of Chiropractic Congress 2001 Pgs. 255

http://www.chiro.org/ChiroZine/ABSTRACTS/A_Comparison_of_Chiropractic_Stude nt_Knowledge.shtml

A previously published knowledge questionnaire designed by chief orthopedic residents was given to a Chiropractic student group for comparison to the results of the medical resident group. Based on the marking scale determined by the chief residents, the Chiropractic group (n = 51) showed statistically significant higher average grade than the orthopedic residents. Expressed in other terms, 70% of chiropractic students passed the knowledge questionnaire, compared to an <u>80%</u> failure rate for the orthopedic residents.

1998 - The adequacy of Medical School Education in Musculoskeletal Medicine

J. Bone and Joint Surgery 1998 (Oct); 80-A (10):1421–1427 KEVIN B. FREEDMAN, M.D. and JOSEPH BERNSTEIN, M.D., M.S., PHILADELPHIA, PENNSYLVANIA

http://www.jbjs.org/article.aspx?Volume=80&page=1421

Given the high prevalence of orthopaedic problems that are encountered in clinical practice, the importance of basic competency in musculoskeletal medicine for all physicians cannot be disputed. Nevertheless, seventy (82 per cent) of eighty-five medical school graduates from thirty-seven different schools failed to demonstrate such competency on a validated examination of fundamental concepts.

Chiropractors pride themselves in their ability to diagnose and manage neuromusculo-skeletal (NMS) complaints. According to all the surveys, this is their bread and butter, and no one is better trained to diagnose (locate) and treat (correct) neck, low back, or peripheral joint (knee, elbow etc) complaints.

Orthopedic surgeons are supposed to be the *gods* of medicine, the pinnacle of medical knowledge. First they become MDs, then rotate through a variety of specialties, and finally take residence in a highly competitive orthopedic program.

The following reflects the weakness of modern medical education:

This series of articles were all mostly published in the prestigious Journal of Bone and Joint Surgery, the "Gold Standard" journal for orthopedic surgeons.

In 1998, two medical doctors at the University of Pennsylvania School of Medicine in Philadelphia, contacted all 157 chairpersons of orthopedic residency programs in the United States. Together they developed and validated a basic-competency examination in musculoskeletal medicine to give to the first year residents. The results were astounding, because 82% of the eighty-five medical school graduates failed this BASIC competency exam!

Four years later they redesigned the exam and again gave it to all the residents. Even though the passing grade was LOWERED from 74% to 70%, 78% of them again failed the exam, with a mean test score average of 59.9 percent.

To add insult to injury, this exact same test was given to a group of 51 chiropractic students during their last semester of schooling. The results? 70% of the students

passed the test. This is in contrast to an 80% failure rate for the MDs.

For clarity sake, you need appreciate the difference between the chiropractic and the medical participants in these studies.

- The chiropractic group were still JUST STUDENTS in their last undergrad year
- The medical group had already graduated medical school, been awarded their MD degrees, completed all their hospital rotations, and finally been accepted into highly competitive orthopedic residencies.

One would expect that, during their 5 years of medical training, followed by endless hours of hospital rotations and residency programs, that all these doctors *might have* picked up a little more musculoskeletal knowledge along the way. Evidently this is NOT the case.

These medical authors concluded that residents in orthopedic surgery programs are not provided with sufficient training in NMS analysis. The truth is, they are incompetent in musculoskeletal assessment or treatment. This situation was not corrected during the 4-year interim between the publication of the 1st and 2nd article, and still has not been corrected 13 years later.

Since that time there has been a storm brewing at medical schools, but in the 13 years since Dr. Freedman published his first paper, medical students still continue to fail on basic musculoskeletal exams, as documented by the following series of peer-reviewed studies. This is a huge problem because:

- "conditions affecting the musculoskeletal system are the primary reason patients seek medical care from physicians, accounting for nearly 100 million office visits per year. [1]
- Furthermore, musculoskeletal conditions are the most common cause of long-term pain and physical disability". [2][3]

What's the best solution? If you have spinal pain, seek care from someone who is properly trained to assess and manage your care. That person is a chiropractor.

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2010 - Subluxation Reviewed, Revisited, Revitalized

Dynamic Chiropractic – March 12, 2010, Vol. 28, Issue 06 Malik Slosberg, DC, MS

Our understanding of the biomechanics and neurology of the subluxation continues to evolve as more research is published which helps explain the nature of this lesion. Historically, the subluxation has been at the heart of the identity and purpose of the chiropractic profession. Contemporary models provide new insights into this elusive and sometimes mysterious problem which we attempt to find by various clinical means and correct by the application of high-velocity, lowamplitude thrusts. This review is of past models, but focuses primarily on the latest evidence concerning the subluxation published in the recent scientific literature in
order to improve our understanding, insight, and application of clinical interventions to improve patient outcomes with chiropractic care.

Older Models of Subluxation: Static Malposition and Pathology

Over the 115-year history of chiropractic, there have been many varied attempts to explain and clarify the subluxation. In the past, descriptions of this lesion were phrased in pathological terms and often included malposition, distortion of the intervertebral foramen and impingement of nerves as primary components. Henderson, et al.,¹ described early notions of subluxation as static mechanical lesions, a misalignment or a bone out of place, as seen on a neutral radiograph. The authors explain that this static model has been vigorously challenged in the scientific literature.

Lantz² raised concerns about the strictly static, structural interpretation of vertebral subluxation and introduced his own hierarchical model including kinesiopathology, neuropathology, myopathology, connective tissue pathology, vascular abnormalities, as well as inflammatory response, histopathology, and biochemical abnormalities. Similarly, <u>Dishman³ described the vertebral subluxation complex in terms of various pathologies</u> including neuropathology, myopathology, kinesiopathology, histopathology, and biochemical abnormalities.

Newer Terminology: Functional Spinal Lesion, Joint Dysfunction With Hypomobility, Joint Complex Dysfunction

In 2001, the World Federation of Chiropractic Congress, in its consensus document, described the subluxation as a complex of functional and/or structural and/or pathological articular changes that compromise neural integrity and may influence organ system function and general health. Pickar⁴ described two mechanistic models of the subluxation: 1) compression/traction of peripheral nerve in the vicinity of the intervertebral foramen; and 2) altered sensory input leading to central facilitation and altered somato-somato and/or somatovisceral reflexes. Triano⁵ noted that the word *subluxation* has no consistent definition. In addition, he explained that the lesion is often treated as a syndrome, a clinical disorder, and suggests the term *functional spinal lesion* because it expresses a spine-related disorder involving function and does not imply pathomechanics, pathophysiology or symptomatology. Triano also noted that there is no method yet which can unequivocally detect and describe its presence. Its detection represents the art of the clinical practice, not its science.

In agreement, with Triano, <u>Seaman⁶ described the subluxation as a dysfunctional</u> joint, not necessarily a pathological one, and suggested the term joint complex dysfunction to express this. <u>Vernon and Mrozek⁷ advocated for the term joint</u> <u>dysfunction with hypomobility</u> to describe these dysfunctional joints as means to achieve some consensus about the nature of this lesion, which has been variously described in terms of "fixation," "somatic dysfunction," "blockage," "loss of joint play," and "hard end feel" by various clinical professions including DCs, MDs, DOs, and PTs.

Vernon and Mrozek described a more contemporary model of a dynamic

biomechanical lesion wherein an error of movement is present that may or may not be associated with misalignment. Gatterman⁸ described subluxation as a joint with impaired mobility with or without positional alteration. From her perspective, the

subluxation is seen as a functional entity involving restricted vertebral movement. After all, she argues, it is the restriction of movement which responds to thrust procedures.

Recently, <u>Panjabi⁹ offered a unique model of joint dysfunction</u> with disturbed kinematics, loss of spatial and temporal integrity of received receptor signals, and corrupted motor programs. This model provides a dynamic explanation which offers distinctive insights into the mechanism and progression of the lesion DCs commonly describe as a subluxation. According to Panjabi's paradigm, difficulties arise because trauma or cumulative microtrauma cause subfailure injury in passive restraints including ligaments, joint capsules, and discs. He described subfailure injury as caused by the stretching of tissue beyond its physiological limit, but less than its failure point. Panjabi¹⁰⁻¹¹ documented these injuries in simulated whiplash studies which used whole cervical sections of human cadaver spines.

Subfailure injury has been described by other researchers as <u>a result of</u> <u>microruptures of collagen fibers</u>,¹² or <u>microdamage of collagen tissues</u>.¹³ With these overstretch injuries, not only are bonds in the connective tissue matrix disrupted, but mechanoreceptors within these structures are also damaged, resulting in partial de-afferentation. This sensory/neurological dimension of overstretching/sprain of passive ligamentous restraints <u>was described by neurosurgeons Freeman and</u> <u>Wyke</u>.¹⁴ The authors documented that a traction injury to a ligament or joint capsule resulted in ruptures of nerve fibers as well as collagen fibers. Nerve fibers have lower tensile strength than the molecular bonds of the connective-tissue matrix. If there is enough tensile force to damage collagen fibers, nerve fibers have been damaged as well.

Loss of Spatial and Temporal Integrity

With this partial de-afferentation, Panjabi¹⁵ explained, there is loss of spatial and temporal integrity of received transducer signals from mechanoreceptors in the damaged ligament or joint capsule. The disturbance in precise, continuous sensory input has been described by other researchers¹⁶⁻¹⁷ as false kinesthetic perception, which introduces errors in the precision of movement and may result in injury. This aberrant feedback is transmitted to the neuromuscular control unit (motor cortex, basal ganglia, cerebellum, motor neurons), which has difficulty interpreting the corrupted transducer signals because there is a mismatch between normally expected signals and the corrupted signals actually received.

Corrupted Muscle Response Pattern

As a result, the muscle response pattern generated is corrupted, affecting coordination and activation of each spinal muscle. The corrupted muscle response pattern affects the choice of which spinal muscles to activate, the force of onset, intensity, and shut-off. As a consequence, <u>changes in the coordination, sequencing, and recruitment of spinal muscles</u> responsible for spinal stability, posture and motion become disrupted.¹⁸

The corrupted muscle response patterns result in abnormal stresses and strains in spinal components, leading to further subfailure injury of spinal ligaments, joint capsules, mechanoreceptors within them, and disturbed kinematics. Errors in onset of muscle activation (delayed onset) and force production (reduced or excess force generation) may result in soft-tissue injury and explain acute low back pain <u>where negligible loads are involved</u>.¹⁹ These changes can set up an inflammatory cascade, producing inflammation of spinal tissues abundant in nociceptors, resulting in chronic pain, recurrences, disturbed kinematics and reduced functional capacity.

Progressive Joint Complex Dysfunction

The process of progressive joint complex dysfunction involves many components including passive stabilizers (subfailure injury of ligaments, joint capsules, discs), somatosensory input (loss of spatial and temporal integrity, and false kinesthetic perception), and neuromotor control (corrupted motor programs, coactivation, sequencing, and recruitment). Disturbances in these systems combine to produce what may be catastrophic acute problems or, perhaps more commonly, a downward spiral of reduced functional capacity, increased risk of reinjury and chronicity.

This dynamic process of joint dysfunction offers an explanation which helps to clarify the clinical presentation of many of our patients and reinforce, with scientific evidence, the clinical observations chiropractors make in practice. The combination of clinical observations and scientific support can increase clinicians' confidence in and quality of our patient education, as well as the benefits we have to offer our patients.

References

- 1. Henderson C, Cramer G, Zhang Q, et al. <u>Introducing the external link model for studying spine fixation</u> <u>and misalignment Part 1</u> - Need, rationale, and applications. *JMPT*, 2007;30:239-45.
- 2. Lantz CA. The vertebral subluxation complex Part 1. An introduction to the model & the kinesiological component. *Chiropractic Research Journal*, 1988;1:23-36.
- 3. Dishman RW. <u>Static and dynamic components of the chiropractic subluxation complex: a literature</u> <u>review.</u> *JMPT*, 1988;11:98-107.
- 4. Pickar J. Neurophysiological issues of the subluxation lesion. Top Clin Chiro, 2001;8:9-15.
- 5. Triano JJ. The subluxation complex: outcome measure of chiropractic diagnosis and treatment. *Chiro Tech*, 1990;2:114-20.
- 6. Seaman D. Joint complex dysfunction: a novel term to replace subluxation/subluxation complex: etiological and treatment considerations. *JMPT*, 1997;20:634-44.
- 7. Vernon H, Mrozek J. <u>A revised definition of manipulation</u>. JMPT, 2005;28:68-72.
- 8. Gatterman M. Foundations of Chiropractic: Subluxation. 2nd Edition. Elsevier Science Health Science, 2005.
- 9. Panjabi MM. <u>A hypothesis of chronic back pain: ligament subfailure injuries lead to muscle control</u> <u>dysfunction.</u> *Eur Spine J*, 2006;15(5):668-76.
- 10. Panjabi MM, et al. <u>Simulation of whiplash trauma using whole cervical spine specimens.</u> *Spine*, 1998;23:17-24.
- 11. Panjabi MM, Pearson AM, Shigeki I, et al. Cervical spine ligament injury during simulated frontal impact. *Spine*, 2004;29(21):2395-403.
- 12. Le B, Davidson B, Solomonow D, et al. <u>Neuromuscular control of lumbar instability following static work</u> of various loads. *Muscle Nerve*, 2009;39(1):71-82.
- 13. Solomonow M. <u>Sensory-motor control of ligaments and associated neuromuscular disorders.</u> J Electromyo Kinesiol, 2006;16:549-67.
- 14. Freeman MAR, et al. <u>The etiology and prevention of functional instability of the foot.</u> *J Bone Joint Surg*, 1965;47B(4):678-85.
- 15. Panjabi MM. A hypothesis of chronic back pain. Op Cit.
- 16. Solomonow M, Op Cit.
- 17. Akuthota V, Ferreiro A, Moore T, et al. <u>Core stability exercise principles.</u> *Curr Sports Med Rep*, 2008;7:39-44.

- 18. Teyhen DS, et al. <u>Fluoroscopic video to identify aberrant lumbar motion</u>. *Spine*, 2007;32:E220-9.
- 19. Panjabi MM. The stabilizing system of the spine. Part I. J Spinal Disorders, 1992;5(4):383-9.

The Rationale for Chiropractic Care.

Briefly, the premise of chiropractic therapy centers on the maintenance of appropriate movement of the spinal joints and optimizing biomechanics throughout the musculoskeletal system. The subluxation has typically been modeled as a localized spinal joint malfunction that impacts the neurology with both local and systemic consequences.

The Chiropractic "Adjustment"

A controlled input of force on a specific contact point in a specific vector-angle in order to overcome abnormal restrictive barriers in or around a joint that are limiting or confining its Range of Motion (ROM). The adjustive force takes the joint beyond its limited or restricted ROM back toward its full ROM, stimulating many populations of neurologic receptors in the process. The adjustive thrust may initiate protective muscular reflexes important in preventing joint degeneration & instability. The biomechanical and neurological effects of the adjustment help restore normal function, range of motion, sensorimotor coordination & control, pattern of motion, biomechanics, load distribution and joint neurology. This helps re-establish the normal biomechanical & neurologic segmental order, restoring smooth, harmonious function.

The chiropractic adjustment is a highly specific manipulation of a joint, primarily of the spine but, increasingly, of all joints of the body. It is described as "high-speed and low-amplitude" - very fast and shallow.

Today, the subluxation is understood to be an area of HYPO-mobility, or reduced movement. It is often simply called a **fixation** .

The significance of these fixations is that it has now been **scientifically proved** that two important things happen:

- Measurable degenerative changes occur in the cartilage in the joint within 12 hours of subluxation.
- Within 1 week proteoglycan loss can be detected. Proteoglycans enable joint cartilage to retain water and collagen to remain elastic.

These **progressive and permanent degenerative** changes within the joint are collectively called **Immobilization Degeneration** . (ID)

SUBLUXATIONS

Chiropractic Subluxation

A subluxation from the Chiropractic viewpoint, is a **HYPO-mobile** joint with DECREASED movement, but no instability due to ligamentous damage. It is this loss of movement that causes Immobilization Arthritis.

Medical Subluxation

A subluxation on the other hand, from a Medical viewpoint, is a **HYPER-mobile** joint as would occur in trauma, or interestingly in conditions such as Rheumatoid Arthritis. Ligamentous laxity allows for INCREASED movement. In the Chiropractic model, mobilization and manipulation (or adjustment) is the treatment of choice. In the Medical model, it's strictly contraindicated.

Hypomobile joints cause INCREASED noxious stimuli entering the dorsal horn, and DECREASED inhibition of this nociceptor activity by mechanoreceptors in the dorsal horn. Initially, this is a silent process. There is no pain. That comes later. This increased nociceptor activity has been shown to have a cascading effect on the autonomic system, and general health

b) Stroke and Chiropractic

Is chiropractic safe?

A number of literature reviews of serious occurrences from chiropractic adjustments have been documented. The most exhaustive study discussed 113 cases of vertebro-basilar accidents following spinal manipulative therapy, from 1934 to 1987, a period of 53 years. Of the cases documented 66 were chiropractic, 18 medical, 9 osteopathic, 2 physical therapist and the remaining 13 were divided between "wife," "self," and "unknown".

Putting these numbers in perspective, there were 66 chiropractic cases in 53 years; a little more than one per year. There are currently about 52,000 chiropractors in practice treating, on average, about 100 patients per week. That works out to 5.2 million adjustments per week or 286 million adjustments per year. This works out to 1 to 2 cases of stroke, paralysis or death per 286 million adjustments. Maigne has stated, "there is probably less than one death of this nature out of several tens-of-millions of manipulations." No matter how one interprets the results, more people die from complications of drugs and surgery in one single afternoon than in decades of cervical adjustments. As a comparison to the risk of manipulation, the risk of paralysis from neurosurgery of the cervical spine is 15,000 cases per million.

Chiropractic: Safer Than Common Pain Medications, Studies Show

Recent news reports on the risks of chiropractic cervical manipulation, or neck adjustments, have needlessly alarmed patients about one of the most safe and effective treatments in health care today, according to the American Chiropractic Association (ACA).

The ACA believes that patients have the right to know about the health risks associated with any type of treatment, including chiropractic. However, health care consumers should be aware that the risks associated with chiropractic treatment are "infinitesimally low," according to Dr. William J. Lauretti, an ACA member and chiropractic researcher from Bethesda, Maryland. "If you drive about a mile to get to your chiropractor's office, you have a statistically greater chance of being seriously injured in a car accident than of being seriously injured during your chiropractic treatment," explains Dr. Lauretti. "The risks of chiropractic have been grossly exaggerated, and health care consumers need to put these sensationalistic news reports into perspective." Despite statistics from dozens of studies demonstrating the safety of chiropractic treatments, recent news reports have alleged that chiropractic neck adjustments can frequently damage arteries in the neck that carry blood to the brain, possibly leading to a stroke. However, according to a study by the Rand Corporation, a serious adverse reaction from cervical manipulation occurs less than once in 1 million treatments. The study also showed that on the rare occasion of an adverse reaction, it is often the result of the procedure being performed by a health

professional (M.D., P.T.) who is inexperienced or inadequately trained in spinal manipulation, rather than by a licensed doctor of chiropractic. Other scientific textbooks and reports have estimated the risk to be even more minute - as low as one in 10 million treatments.

During their five-year post-graduate education, doctors of chiropractic are alerted to possible risk factors and taught when to modify their technique or refer a patient for other specialty care. Risk management is also a frequent topic in the continuing education seminars that most states require practicing chiropractors to attend annually.

"Chiropractic researchers have published dozens of studies in recent years that will help chiropractors identify the rare patients who have risk factors," notes Dr. Lauretti. "Studies recently published in the chiropractic literature have found that the risks associated with chiropractic treatments are less than or similar to the risks associated with other conservative treatments often used for similar conditions, such as common prescription and non-prescription medications. Other recently published and ongoing studies are testing the validity of pre-treatment screening tests, and devising strategies for even further minimizing the risks of chiropractic neck treatments."

When compared to the number of illnesses and deaths that will occur this year from the use of prescription and over-the-counter drugs, the number of serious complications from chiropractic treatment is extremely low. A study published in the April 15, 1998 issue of the Journal of the American Medical Association found that more than 2 million Americans become seriously ill every year from reactions to drugs that were correctly prescribed and taken; 106,000 Americans die annually from those side effects.

Complications from non-steroidal anti-inflammatory drugs (NSAIDs) -- a group that includes prescription and non-prescription pain medications such as aspirin and ibuprofen -- are responsible for 16,500 deaths each year, according to the New England Journal of Medicine. To put this in perspective, approximately 16,500 people died of AIDS in the United States in 1998, according to the Centers for Disease Control and Prevention.

In addition, a more recent study conducted by the Institute of Medicine revealed that nearly 100,000 people die each year from medical mistakes made by physicians, pharmacists and other medical professionals.

"The time has come for the medical community and the media to focus their efforts

on warning patients about common procedures with very real risks associated with them -- such as the inappropriate use of drugs and surgery," said Dr. Lauretti. "Chiropractic has been proven to be a safe and effective non-drug, non-surgical treatment for a variety of conditions, and tens of millions of satisfied chiropractic patients will attest to this fact."

Stroke is one of the leading causes of death. The CDC reports that 700,000 people experience a stroke each year, and that 160,000 of themare fatal. The risk of death from stroke also increases with age. Statistics, reviewed between the years 1979 to 1991, found that the yearly incidence rates of death by stroke for those in the 25–44 years age bracket was only 3,418 deaths, whereas at the age of 65 or above, incidence rates increased to 140,938 deaths yearly. [1]

Stroke is characterized by the sudden loss of circulation to an area of the brain, resulting in a corresponding loss of neurologic function. Also called a "*Cerebrovascular Accident*" (CVA), stroke is a nonspecific term, which describes a cross-section of pathophysiologic causes, which include thrombosis, embolism, and hemorrhage. [1]

Chiropractors are particularly interested in strokes caused by "**Vertebral Artery Dissection**" (VAD). Dissections of the Carotid Artery (CAD) or the Vertebral Artery (VAD) are relatively rare. The combined incidence of both VAD and CAD is estimated to be 2.6 per 100,000. However, cervical dissections are the underlying etiology in as many as 20% of the ischemic strokes presenting in younger patients aged 30–45 years. Among all extracranial cervical artery dissections, CAD is 3–5 times more common than VAD. The female–to–male incidence ratio is 3:1 [2]

The path of the Vertebral Artery is well described elsewhere. [2] The portion referred to as **Segment III** follows a "tortuous" route from the transverse foramen of C2, running posterolaterally to loop around the posterior arch of C1". This is the most common site for VAD associated with cervical manipulation. The rest of this page is devoted to examining the causes of Vertebral Artery Dissection. VAD has occurred following actions as trivial as coughing, rotating the head to back a car out of a driveway, and other "normal" activities like archery and visits to the hairdresser.

Most reported cases of VAD have similar characteristics: The underlying and preexisting disease of the intima of the artery, and an "initiating event" which involves rotation and/or extension of the cervical spine. Chiropractic manipulation (which is typically the *diversified technique*) has been labeled the "proximal event" in reported cases of stroke-after-manipulation because of it's reliance on a rotational component. Even though more than 90% of the profession uses that technique, the reported incidence of VAD is still only about 1 out of 3 million manipulations. [4]



A well-balanced report in the **Canadian Medical Association Journal** [3], states that "neck manipulation as a therapeutic strategy for head and neck pain is common and may be effective" and concludes that until methods of identification of "high risk" populations improves, chiropractors should inform all patients of possible serious complications before neck manipulation (informed-consent).

When compared to many medical procedures used for the same complaint, the chiropractic adjustment is <u>hundreds to thousands of times safer</u>! Refer to the "<u>Comparison of Death Rates Attributed to Various Causes</u>" Chart below.

Dr. Scott Haldeman et al. wrote a follow-up article to the Canadian Stroke Consortium piece cited above. They reviewed 10 years worth of malpractice claims files in Canada for it's 4500 chiropractors. They found that: "The likelihood that a chiropractor will be made aware of an arterial dissection following cervical manipulation is approximately 1:8.06 million office visits, 1:5.85 million cervical manipulations, 1:1430 chiropractic practice years and 1:48 chiropractic practice careers. This is significantly less than the estimates of 1:500,000–1 million cervical manipulations calculated from surveys of neurologists". [4].

An recent in-depth retrospective review [5] of patient files from reported cases of

VAD attempted to evaluate the characteristics of the treatment rendered, and the presenting complaints of those patients. They found:

- 25 % cases presented with sudden onset of new and unusual headache and neck pain often associated with other neurological symptoms that may represent a dissection in progress; A second, earlier study [6] also notes vertigo or unilateral facial paresthesia is an important warning sign that may precede onset of stroke by several days.
- There was no apparent dose-response relationship to these complications;
- They occurred following any form of standard cervical manipulation technique, including rotation, extension, lateral flexion and non-force and neutral position manipulations, and
- Based upon this review, stroke, particularly vertebrobasilar dissection, <u>should</u> <u>be considered a random and unpredictable complication of any neck</u> <u>movement, including cervical manipulation</u>.

The most recent in-depth review, published in the <u>Feb 15, 2008 Spine Journal [9]</u> was completed by members of the Spine Decade Task Force. It reviewed 10 years worth of hospital records, involving 100 million person-years. Those records revealed no increase in vertebral artery dissection risk with chiropractic, compared with medical management, and further stated that "increased risks of VBA stroke associated with chiropractic and PCP visits is likely due to patients with headache and neck pain from VBA dissection seeking care before their stroke."

It is now becoming apparent that chiropractors may have prematurely accepted the notion that cervical adjusting/manipulation could be a "causative" event for VAD. That was a reasonable and professional response to case-studies and reports in the peer-reviewed medical literature, which was often based on a <u>pattern of medical</u> <u>mis-reporting</u> later documented by Terrett. [7]

The recently published "Current Concepts: Spinal Manipulation and Cervical Arterial Incidents 2005" (NCMIC) [8] concludes in it's Executive Summary: "Unfortunately, opinion rather than fact has tended to dominate discussions

regarding CVAs and chiropractic, even though there has been no definitive evidence that chiropractic adjustments (actually) cause strokes. The good news is that this monograph notes that a causative relationship between chiropractic manipulation and stroke is unlikely. There is an associative relationship between the two because people may go to chiropractors for relief of stroke-related symptoms".

It also recommends that chiropractors pay close attention when patients present with sudden onset of headache/neck/face pain that's <u>different</u> than the patient has had before.

If so, evaluate for a history of:

- Drugs/medication (smoking, oral contraceptives);
- Physical trauma (which may have damaged arterial structures);
- Connective tissue diseases (autosomal dominant polycystic kidney disease, Ehlers-Danlos type IV, Marfan Syndrome, Fibromuscular Dystrophy);
- Genitourinary system (frequent urinary tract infection, hematuria);

- Nervous system (dysarthria, dysphagia, visual changes, dizziness, confusion, giddiness and vertigo);
- Cardiovascular system (stroke, TIAs, mitral prolapse, aortic dilation, hypertension).

Differentiating "normal" head and neck pain from a CVA:

- Transient Ischemic Attacks (TIAs)— often have similar symptoms to a CVA. If the patient suffers from carotid TIAs, get a quick medical referral. The patient may suffer a complete stroke after only a few episodes.
- Dizziness, unsteadiness, vertigo, giddiness—Question the patient about:
- Aggravating factors, such as neck position or head movement
 - If any of the other <u>5 Ds and 3 Ns</u> exist (see below)
 - Whether new symptoms have occurred or existing symptoms aggravated by previous cSMT
- Migraine headaches— When a patient presents with a migraine, stroke is uncommon and is usually in the posterior cerebral artery.
- Cervicogenic headaches— primary features:
- Mechanical precipitation or aggravation of head pain
- facet joint tenderness
- neck muscle tenderness
- palpatory pressures reproducing head symptoms

If so, then evaluate for the "signs" of a stroke. Can they: smile, raise both arms, stand steady on both feet with their eyes closed. speak a simple sentence with several vowels that run together, such as "Simple Simon Says", or stick out their tongue?

These are also known as the 5 D's and the 3 N's:

- Diplopia \rightarrow Double vision or other vision problems
- Dizziness \rightarrow Vertigo, light-headedness
- Drop Attacks \rightarrow Sudden numbness/weakness of face/arm/leg
- Disarthria \rightarrow Difficulty speaking
- Dysphagia \rightarrow Difficulty swallowing
- Ataxia of Gait \rightarrow Difficulty walking
- Nausea \rightarrow Vomiting or queasiness
- Numbness \rightarrow Loss of sensation on one side
- Nystagmus \rightarrow Involuntary rapid eye movements

If you suspect that your patient may have had (or is having) a stroke, <u>do NOT</u> <u>adjust their neck</u>. Get them to a hospital for an evaluation MRI/MRA.

It's also advisable to not offer the patient anything to eat or drink, and that you do NOT allow patients who improve spontaneously to drive home. Remember that transient ischemic attacks (TIA) are warning signs for stroke. The symptoms are similar to CVAs although they can resolve spontaneously. Protect your patient by advising an immediate medical referral.

References:

- [1] Ischemic Stroke
- eMedicine Journal 2001 (Aug 17); 2 (8) [2] <u>Sudden Vertebral Artery Dissection</u> eMedicine Journal 2002 (May 30); 3 (5)
- [3] <u>Sudden Neck Movement and Cervical Artery Dissection</u> CMAJ 2000; 163 (1): 38–40
- [4] <u>Sudden Neck Movement and Cervical Artery Dissection:</u> <u>The Chiropractic Experience</u> CMAJ 2001; 165 (7): 905–906
- [5] Stroke, Cerebral Artery Dissection, and Cervical Spine Manipulation Therapy
- J Neurol 2002 (Aug); 249 (8): 1098–1104 [6] Vertebral Artery Dissection: Warning Symptoms, Clinical Features and Prognosis in 26 Patients
- Can J Neurol Sci 2000 (Nov); 27 (4): 292-296
- [7] <u>Misuse of the Literature by Medical Authors in Discussing Spinal Manipulative Therapy Injury</u> J Manipulative Physiol Ther 1995 (May); 18 (4): 203-210
- [8] <u>Current Concepts:</u> <u>Spinal Manipulation and Cervical Arterial Incidents 2005</u> From NCMIC ~ The Executive Summary (8 pages)
- [9] <u>Risk of Vertebrobasilar Stroke and Chiropractic Care:</u> <u>Results of a Population-based Case-control and Case-crossover Study</u> Spine 2008 (Feb 15); 33 (4 Suppl): S176–183

2013 - Effect of selected manual therapy interventions for mechanical neck pain on vertebral and internal carotid arterial blood flow and cerebral inflow

Thomas LC et al.

Physical Therapy, 08/26/2013

Clinical Article

The purpose of this study was to examine the effects of selected manual therapeutic interventions on blood flow in the craniocervical arteries and blood supply to the brain using magnetic resonance angiography (MRA). Blood flow to the brain does not appear to be compromised by positions commonly used in manual therapy. Positions using end-range neck rotation and distraction do not appear to be more hazardous to cerebral circulation than more segmentally localized techniques.

Methods

- This was an experimental, observational magnetic resonance imaging study.
- Twenty adult participants who were healthy and had a mean age of 33 years were imaged using MRA in the following neck positions: neutral, rotation, rotation/distraction (similar to a Cyriax manipulation), C1–C2 rotation (similar to a Maitland or osteopathic manipulation), and distraction.

Results

- The participants were imaged using 3T MRA.
- All participants had normal vascular anatomy.
- Average inflow to the brain in neutral was 6.98 mL/s and was not
- significantly changed by any of the test positions.

 There was no significant difference in flow in any of the 4 arteries in any position from neutral, despite large individual variations.

2011 - Iatrogenic Vertebral Artery Injury

<u>http://www.chiro.org/LINKS/ABSTRACTS/Iatrogenic Vertebral Artery Injury.shtml</u> Vertebral Arteries are also injured during a wide variety of medical procedures and surgeries.

2011 - Stroke & Essential Fatty Acids

http://www.chiro.org/nutrition/ABSTRACTS/Stroke_and_EFA.shtml

Stroke is the third leading cause of death in the US. Fortunately, diagnostic imaging for stroke risk and stroke-prevention strategies have advanced greatly in recent years. It is now possible to reduce the artery-clogging plaque that leads to stroke, offering hope that this debilitating condition can be prevented.

2011 - The Safety of Cervical Manipulation: Putting Stroke Risk in Perspective

http://www.chiro.org/LINKS/ABSTRACTS/The_Safety_of_Cervical_Manipulation.sht ml

Dynamic Chiropractic 2011 (May 20); 29 (11):29, 43, 45

Several studies have attempted to link chiropractic manipulation to adverse events, the most serious and widely studied being strokes following dissections of the vertebral artery. To begin to shed light on this problem, several retrospective studies against large population bases have been conducted. A large sampling of such studies indicates that the number of serious complications or cerebrovascular accidents (CVAs), as established by researchers from both the chiropractic and medical professions, ranges from one case per 400,000 manipulations to zero in 5 million.

2011 - Conducting an Orchestra Can Cause Vertebral Artery

Dissection: "Ostrich Sign" Indicates Bilateral Vertebral Artery Dissection Journal of Stroke and Cerebrovascular Diseases 2011 (Mar 24) [Epub ahead of print]

http://www.ncbi.nlm.nih.gov/pubmed/21440457

Vertebral artery dissections (VADs) comprise about 2% of ischemic strokes and can be associated with trauma, chiropractic manipulation, motor vehicle collisions, whiplash, amusement park rides, golfing, and other motion-induced injuries to the neck. We present a case of bilateral extracranial VAD as a complication of conducting an orchestra. To our knowledge, this has not been documented in the literature. Conceivably, vigorous neck twisting in an inexperienced, amateur conductor may place excessive rotational forces upon mobile portions of the verterbral arteries, tear the intima, deposit subintimal blood that extends longitudinally, and cause neck pain and/or posterior fossa ischemic symptoms.

2011 - A Population-Based Case-Series of Ontario Patients Who Develop a Vertebrobasilar Artery Stroke After Seeing a Chiropractor

J Manipulative Physiol Ther 2011 (Jan); 34 (1): 15–22 http://www.ncbi.nlm.nih.gov/pubmed/21237403

Ninety-three VBA stroke cases consulted a chiropractor during the year before their stroke. The mean age was 57.6 years (SD, 16.1), and 50% were female. Most cases had consulted a medical doctor during the year before their stroke, and 75.3% of patients had at least one cerebrovascular comorbidity. The 3 most common comorbidities were neck pain and headache (prevalence, 66.7%; 95% confidence interval [CI], 57.0%-76.3%), diseases of the circulatory system (prevalence, 63.4%; 95% CI, 54.8%-74.2%), and diseases of the nervous system and sense organs (prevalence, 47.3%; 95% CI, 38.7%-58.1%). Our population-based analysis suggests that VBA stroke patients who consulted a chiropractor the year before their stroke are older than previously documented in clinical case series. We did not find that women were more commonly affected than men. Moreover, we found that most patients had at least one cardio or cerebrovascular comorbidity. Our analysis suggests that relying on case series or surveys of health care professionals may provide a biased view of who develops a VBA stroke.

2010 - Current Understanding of the Relationship Between Cervical Manipulation and Stroke: What Does It Mean for the Chiropractic Profession?

Chiropractic & Osteopathy 2010 (Aug 3);18 (1):1–9 http://chiromt.com/content/pdf/1746-1340-18-22.pdf

The understanding of the relationship between cervical manipulative therapy (CMT) and vertebral artery dissection and stroke (VADS) has evolved considerably over the years. In the beginning the relationship was seen as simple cause-effect, in which CMT was seen to cause VADS in certain susceptible individuals. This was perceived as extremely rare by chiropractic physicians, but as far more common by neurologists and others. Recent evidence has clarified the relationship considerably, and suggests that the relationship is not causal, but that patients with VADS often have initial symptoms which cause them to seek care from a chiropractic physician and have a stroke some time after, independent of the chiropractic visit. This new understanding has shifted the focus for the chiropractic physician from one of attempting to "screen" for "risk of complication to manipulation" to one of recognizing the patient who may be having VADS so that early diagnosis and intervention can be pursued. In addition, this new understanding presents the chiropractic profession with an opportunity to change the conversation about CMT and VADS by taking a proactive, public health approach to this uncommon but potentially devastating disorder.

2010 - Preliminary Report: Biomechanics of Vertebral Artery Segments C1-C6 During Cervical Spinal Manipulation

J Manipulative Physiol Ther. 2010 (May);33 (4):273–278 http://www.ncbi.nlm.nih.gov/pubmed/20534313 The results of this study suggest complex and nonintuitive strain patterns of the VA within the cervical transverse foramina. Consistent (for 2 chiropractors) and repeatable (for 3 repeat measurements for each chiropractor) elongation and shortening of adjacent VA segments were observed simultaneously and could not be explained with a simple model of neck movement. We hypothesized that they were caused by variations in the location and stiffness of the VA fascial attachments to the vertebral foramina and by coupled movements of the cervical vertebrae. However, in agreement with previous work on VA strains proximal and distal to the cervical transverse foramina, strains for cervical spinal manipulations were consistently lower than those obtained for cervical rotation.

2010 - Microstructural Damage in Arterial Tissue Exposed to Repeated Tensile Strains

J Manipulative Physiol Ther 2010 (Jan);33 (1):14-19

http://www.chiro.org/LINKS/ABSTRACTS/Microstructural_Damage.shtml

Twenty-four test specimens from cadaveric rabbit ascending aorta were divided into 2 control groups (n = 12) and 2 experimental groups (n = 6 each). Specimens were exposed to 1000 strain cycles of 0.06 and 0.30 of their in situ length. A pathologist, blinded to the experimental groups, assessed microstructural changes in the arteries using quantitative histology. Pearson ?2 analysis (a = .05) was used to assess differences in tissue microstructure between groups. Cadaveric arterial tissues of New Zealand white rabbit with similar size, structure, and mechanical properties of human vertebral artery did not exhibit histologically identifiable microdamage when exposed to repeated mechanical loading equivalent to the strains observed in human vertebral artery during chiropractic cervical spine manipulative therapy.

2010 - Patients With Symptoms and Signs of Stroke Presenting to a Rural Chiropractic Practice

J Manipulative Physiol Ther 2010 (Jan);33 (1):62–69 http://www.ncbi.nlm.nih.gov/pubmed/20114102

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Patients with symptoms and signs of stroke may infrequently present to chiropractic physicians for evaluation and treatment, regardless of the interval since the last prior chiropractic treatment. Several prehospital stroke recognition instruments were introduced in the mid-1990s, including the Los Angeles Paramedic Stroke Scale, the Cincinnati Prehospital Stroke Scale, and in the United Kingdom the Face Arm Speech Test (FAST), a modification of the Cincinnati scale. The FAST

seems particularly well suited as a tool for chiropractic physicians, their staff, and for patient education; indeed, this tool is already being used by health educators and nurses to train persons for rapid stroke recognition (Table 4). Table 4. The Face Arm Speech Test, also known as FAST [5]

- **Face**: Ask person to smile. Does one side of the face droop?
- **A Arm**: Ask person to raise both arms. Does one arm drift downward?
- **S Speech**: Ask the person to say their name or a simple sentence. Is the speech slurred or unusual?
- **T Time**: If any of these signs, call 911 or get to the nearest stroke center or hospital immediately.

2010 - Bow Hunter's Stroke

Another instance of extension and rotational stresses leading to stroke. http://www.chiro.org/LINKS/ABSTRACTS/Bow_Hunter_Stroke.shtml

2008 - Risk of Vertebrobasilar Stroke and Chiropractic Care: Results of a Population-based Case-control and Case-crossover Study

Spine 2008 (Feb 15); 33 (4 Suppl): S176–183 http://www.ncbi.nlm.nih.gov/sites/entrez?cmd=Retrieve&db=pubmed&dopt=Citati

on&list uids=18204390

VBA stroke is a very rare event in the population. There was an association between chiropractic services and subsequent vertebrobasilar artery stroke in persons under 45 years of age, but a similar association was also observed among patients receiving general practitioner services. This is likely explained by patients with vertebrobasilar artery dissection-related neck pain or headache seeking care before having their stroke.

2008 - Examining Vertebrobasilar Artery Stroke in Two Canadian Provinces.

Spine. 33(4S) Neck Pain Task Force Supplement:S170-S175, February 15, 2008. Boyle, Eleanor PhD *+; Cote, Pierre DC, PhD *S][P]; Grier, Alexander R. DC, MBA; Cassidy, J David DC, PhD, DrMedSc *[S]

Abstract:

Study Design. Ecological study.

Objectives. To determine the annual incidence of hospitalized vertebrobasilar artery (VBA) stroke and chiropractic utilization in Saskatchewan and Ontario between 1993 and 2004. To determine whether at an ecological level, the incidence of VBA stroke parallels the incidence of chiropractic utilization.

Summary of Background Data. Little is known about the incidence and time trends of VBA stroke diagnoses in the population. Chiropractic manipulation to the neck is believed to be a risk factor for VBA stroke. No study has yet found an association between chiropractic utilization and VBA diagnoses at the population level.

Methods. All hospitalizations with discharge diagnoses of VBA stroke were extracted from administrative databases for Saskatchewan and Ontario. We included incident cases that were diagnosed between January 1993 and December 2004 for Saskatchewan and from April 1993 to March 2002 for Ontario. VBA cases that had previously been hospitalized for any stroke or transient ischemic attack (TIA) were excluded. Chiropractic utilization was measured using billing data from Saskatchewan Health and Ontario Health Insurance Plan. Denominators were derived from Statistics Canada's annual population estimates.

Results. The incidence rate of VBA stroke was 0.855 per 100,000 person-years for Saskatchewan and 0.750 per 100,000 person-years for Ontario. The annual incidence rate spiked dramatically with a 360% increase for Saskatchewan in 2000. There was a 38% increase for the 2000 incidence rate in Ontario. The rate of chiropractic utilization did not increase significantly during the study period. **Conclusion.** In Saskatchewan, we observed a dramatic increase in the incidence rate in 2000 and there was a corresponding relatively small increase in chiropractic

utilization. In Ontario, there was a small increase in the incidence rate; however, chiropractic utilization decreased. At the ecological level, the increase in VBA stroke does not seem to be associated with an increase in the rate of chiropractic utilization.

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2007 - Putting Risk into Perspective

ACAnews ~ September 2007

http://www.chiro.org/LINKS/ABSTRACTS/Putting Risks into Perspective.shtml Over the last three years, doctors of chiropractic in the state of Connecticut have been subject to a rash of anti-chiropractic advertisements conspicuously placed on rolling and static billboards, and in well-read statewide newspapers. Most recently, doctors saw a spate of unprecedented anti-chiropractic legislation aimed to mandate informed consent in chiropractic offices and require open access to chiropractic malpractice records. To properly assess the risks of chiropractic treatment, it must be compared against the risks of other treatments for similar conditions. For example, the most common first-line medical treatment for neck pain are non-steroidal anti-inflammatory drugs (NSAIDs). A 1999 study published in the New England Journal of Medicine (NEJM) estimated that at least 103,000 patients are hospitalized per year in the United States for serious gastrointestinal complications due to NSAID use. More recently a separate study from NEJM estimated that at least 16,500 NSAID-related deaths occur among patients each year.

2007 -The Benefits Outweigh the Risks for Patients Undergoing Chiropractic Care for Neck Pain: A Prospective, Multicenter, Cohort Study

J Manipulative Physiol Ther 2007 (Jul); 30 (6): 408–418 http://www.chiro.org/LINKS/ABSTRACTS/The Benefits Outweigh the Risks.shtml In contrast to clinical trials of prescription medication, researchers in the area of conservative care for musculoskeletal complaints have focused their attention on treatment effectiveness and, to a much lesser degree, on adverse events. This study, consisting of patients treated in a wide variety of chiropractic practices and settings, describes both positive and negative, and short- and long-term clinical outcomes for a relatively large study population with neck pain. Although many of the subjects (in this study) had chronic, recurrent neck pain and had undergone prior care for this complaint, many patients experienced benefit from the treatment (based upon diminished pain and disability, the percentage of patients recovered and percentage satisfied with care). Furthermore, many responded relatively quickly to treatment (48% were recovered at the fourth visit).

2006 - Beauty Parlor Stroke Syndrome

http://www.chiro.org/LINKS/ABSTRACTS/Beauty_Parlor_Stroke.shtml Extension and rotational stressors, on an already-diseased Vertebral Artery, is the real culprit. There has been less reporting of "Beauty Parlor Stroke" than there has been for chiropractic-related strokes, but it is likely it occurs much more frequently.

2006 - Inappropriate Use of the title Chiropractor and term Chiropractic Manipulation in the Peer-reviewed Biomedical Literature

Chiropractic & Osteopathy 2006 (Aug 22);14 (1):16

http://chiromt.com/content/pdf/1746-1340-14-16.pdf

The results of this year-long prospective review suggests that the words chiropractor and chiropractic manipulation are often used inappropriately by European biomedical researchers when reporting apparent associations between cervical spine manipulation and symptoms suggestive of traumatic injury. Furthermore, in those cases reported here, the spurious use of terminology seems to have passed through the peer-review process without correction. Additionally, these findings provide further preliminary evidence, beyond that already provided by Terrett, that the inappropriate use of the title chiropractor and term chiropractic manipulation may be a significant source of over-reporting of the link between the care provided by chiropractors and injury.

2006 - Inappropriate use of the title chiropractor and term chiropractic manipulation in the peer-reviewed biomedical literature.

Chiropr Osteopat. 2006 Aug 22;14(1):16 [Epub ahead of print] Wenban AB.

ABSTRACT: BACKGROUND: The misuse of the title chiropractor and term chiropractic manipulation, in relation to injury associated with cervical spine manipulation, have previously been reported in the peer-reviewed literature. The objectives of this study were to 1) Prospectively monitor the peer-reviewed literature for papers reporting an association between chiropractic, or chiropractic manipulation, and injury; 2) Contact lead authors of papers that report such an association in order to determine the basis upon which the title chiropractor and/or term chiropractic manipulation was used; 3) Document the outcome of submission of letters to the editors of journals wherein the title chiropractor, and/or term chiropractic manipulation, had been misused and resulted in the over-reporting of chiropractic induced injury.

METHODS: One electronic database (PubMed) was monitored prospectively, via monthly PubMed searches, during a 12 month period (June 2003 to May 2004). Once relevant papers were located, they were reviewed. If the qualifications and/or profession of the care provider/s were not apparent, an attempt was made to confirm them via direct e-mail communication with the principal researcher of each respective paper. A letter was then sent to the editor of each involved journal. **RESULTS:** A total of twenty four different cases, spread across six separate publications, were located via the monthly PubMed searches. All twenty four cases took place in one of two European countries. The six publications consisted of four case reports, each containing one patient, one case series, involving twenty relevant cases, and a secondary report that pertained to one of the four case reports. In each of the six publications the authors suggest the care provider was a chiropractor and that each patient received chiropractic manipulation of the cervical spine prior to developing symptoms suggestive of traumatic injury. Regarding two of the four case reports contact with the principal researcher revealed that the care provider was not a chiropractor, as defined by the World Federation of Chiropractic. The authors of the other two case reports did not respond to my communications. Regarding the case series, which involved twenty relevant cases, the principal

researcher conceded that the term chiropractor had been inappropriately used and that his case series did not relate to chiropractors who had undergone appropriate formal training. The author of the secondary report, a British Medical Journal editor, conceded that he had misused the title chiropractor. Letters to editors were accepted and published by all four journals to which they were sent. To date one of the four journals has published a correction.

CONCLUSIONS: The results of this year-long prospective review suggests that the words chiropractor and chiropractic manipulation are often used inappropriately by European biomedical researchers when reporting apparent associations between cervical spine manipulation and symptoms suggestive of traumatic injury. Furthermore, in those cases reported here, the spurious use of terminology seems to have passed through the peer-review process without correction. Additionally, these findings provide further preliminary evidence, beyond that already provided by Terrett, that the inappropriate use of the title chiropractor and term chiropractic manipulation may be a significant source of over-reporting of the link between the care provided by chiropractors and injury. Finally, editors of peer-reviewed journals were amenable to publishing letters to editors, and to a lesser extent corrections, when authors had inappropriately used the title chiropractor and/or term chiropractic manipulation.

2006 - Cerebrovascular Accident Without Chiropractic Manipulation: A Case Report

J Manipulative Physiol Ther 2006 (May);29 (4):330–335 http://www.ncbi.nlm.nih.gov/pubmed/16690388?dopt=Abstract

A 49-year-old man with non-traumatic chronic episodic head and neck pain presented for care. Examination and plain film radiographs were unremarkable, suggesting a mechanical origin for the symptoms; however, information in the case history raised concerns. The patient was examined and not manipulated by the doctor of chiropractic but referred back to his general practitioner for a second opinion. The following week, the patient was admitted to hospital having had a cerebrovascular accident. The possible indication of the prodrome to a stroke may lie in the case history rather than the examination findings and provocative testing.

2006 - Are German Orthopedic Surgeons Killing People With Chiropractic? Journal of Neurology 2006 (Mar 6)

http://www.chiro.org/Professional_Regulation/

This abstract blatantly conceals the facts stated in the body of the paper when it states that "we describe 36 patients with vertebral artery dissections and prior chiropractic neck manipulation". When I read that sentence, I am led to believe that "real-live chiropractors" (meaning licensed Doctors of Chiropractic, who received their training at a CCE/WCCE accredited schools) were the ones to provide the "chiropractic neck manipulation". Unfortunately, that couldn't be further from the truth!

2005 - Cervical Artery Dissection A Comparison of Highly Dynamic Mechanisms: Manipulation Versus Motor Vehicle Collision

J Manipulative Physiol Ther 2005 (Jan);28 (1):57-63

http://www.ncbi.nlm.nih.gov/pubmed/15726036

This recent review of the literature finds: "Additionally, long-lasting abnormalities of blood flow velocity within the vertebral artery have been reported in patients following common whiplash injuries, whereas no significant changes in vertebral artery peak flow velocity were observed following cervical chiropractic manipulative therapy", and concludes that: "The direct evidence suggests that the healthy vertebral artery is not at risk from properly performed chiropractic manipulative procedures".

2004 - Defining the Effect of Cervical Manipulation on Vertebral Artery Integrity: Establishment of an Animal Model

J Manipulative Physiol Ther 2004 (Nov);27 (9):539–546 http://www.ncbi.nlm.nih.gov/pubmed/15614240

Over the past 5 to 10 years, the issue of cerebrovascular accidents (CVAs) and spinal manipulation has become a debate of ever-increasing intensity. A copious number of studies have investigated spinal manipulation as a putatative causative factor of CVAs [1-5]; however, a common theme among these is the failure to consider that the majority of vertebrobasilar accidents (VBAs) may be spontaneous, cumulative, or caused by factors other than spinal manipulation. The problem is not served by the sometimes hysterical reactions apparent in the media over the past 2 years in reaction to the flawed investigations.[6-11] In light of these recent reports, the entire phenomenon of spontaneous cervical artery dissections should be revisited to put this matter into a better perspective.

2004 - Spontaneous Cervical Artery Dissections and Implications for Homocysteine

J Manipulative Physiol Ther 2004 (Feb);27 (2):124–132 http://www.journals.elsevierhealth.com/periodicals/ymmt/article/PIIS01614754030 02318/fulltext

The annual incidence of spontaneous VADs in hospital settings has been estimated to occur at the rate of 1 to 1.5 per 100,000 patients. The corresponding VAD incidence rate in community settings has been reported to be twice as high. Using an estimated value of 10 from the literature to represent an average number of manipulations per patient per episode, it becomes apparent that the proposed exposure rate for CVAs attributed to spinal manipulation is equivalent to the spontaneous rates for cervical arterial dissections as reported. If the threat of stroke or stroke-like symptoms is to be properly assessed, therefore, at least half our attention needs to be directed toward the spontaneous events instead of primarily or solely on spinal manipulation.

2004 - The Stroke Issue: Paucity of Valid Data, Plethora of Unsubstantiated Conjecture

J Manipulative Physiol Ther 2004 (June);27 (5):368-372

http://www.jmptonline.org/article/S0161-4754%2804%2900054-5/fulltext Chiropractic can be proud of its exemplary standards in the areas of informed consent and the allocation of funding for research to study issues of safety. As a responsible, ethical, and caring profession, chiropractic must continue to look into the issue regarding the potential risk of chiropractic adjustment. At this time, it cannot be scientifically stated that there is no risk of VBA dissection from chiropractic cervical adjustment. It can, however, be scientifically stated that there is neither valid evidence of a causal relationship between chiropractic cervical adjustment and VBA dissection nor any valid data to estimate a risk of VBA dissection associated with chiropractic cervical adjustment. It can also be stated that the data that are available regarding the total number of adjustments performed each year, the total number of VBA dissections and occlusions that occur in the absence of chiropractic adjustment each year, and the data that indicate a chiropractic cervical adjustment represents less force to the vertebral artery than movement within the normal range of motion make it more logical to assume a temporal rather than causal link between these 2 events.

2003 - Response to Vertebral Artery Dissection Study: Synopsis Paper Neurology, May 13, 2003; Smith et al.

http://www.chiro.org/LINKS/FULL/Response_to_NEUROLOGY_Vertebral_Artery_Stu dy.shtml

The recent publication by Smith et al. in Neurology addressing vertebral artery dissection represents another episode of regrettable studies which, despite serious flaws which raise substantial questions as to their internal validity, go at great lengths to selectively disparage the advisability of performing cervical manipulations as a means of patient care while obscuring the larger picture.

2003 - Motor Vehicle Accidents:The Most Common Cause of Traumatic Vertebrobasilar Ischemia

Can J Neurol Sci 2003 (Nov); 30 (4): 320–325 http://www.ncbi.nlm.nih.gov/pubmed/14672263

There were 80 patients whose vertebrobasilar ischemia was attributed to neck trauma. Five were diagnosed as due to chiropractic manipulation, but the commonest attributed cause was motor vehicle accidents (MVAs), which accounted for 70 cases; one was a sports injury, and five were industrial accidents. In some cases neck pain from an MVA led to chiropractic manipulation, so the cause may have been compounded. In most vehicular cases the diagnosis had been missed, even denied, by the neurologists and neurosurgeons initially involved. The longest delay between the injury and the onset of delayed symptoms was five years.

2003 - VAD Following Cervical Manipulation: D.C. vs M.D. Experiences Affect Perception of Risk

FCER ~ January 13, 2003

http://www.chiro.org/LINKS/FULL/VAD_Following_Cervical_Manipulation.htm

Examination of the database of the Canadian Chiropractic Protective Association (CCPA, which provides malpractice insurance for 83% of chiropractors in Canada) for the period 1988 to 1997 found 23 cases of VAD. Retrospective review of these cases and a survey of chiropractors suggests an estimated 134,466,765 cervical manipulations were performed during the 10-year period. Records from these reported VAD cases indicates that in a 30 year practice, only one in 48 chiropractors would be aware of a vascular incident following cervical manipulation. In contrast, examination of the records show that these 23 VAD patients saw a total

of 216 physicians, including 69 neurologists.

2003 - Cerebrovascular Accidents: The Rest of The Story

International Spinal Trauma Conference, June 20, 2003; AL Rosner, PhD., Research Director for FCER

http://www.chiro.org/LINKS/CVA/Cerebrovascular_Accidents.shtml

During the past decade, the issues of cerebrovascular accidents [CVAs] and spinal manipulation have become linked in a debate of ever-increasing intensity. A copious number of studies have investigated spinal manipulation as a putative causative factor of CVAs; however, a common theme among these is the failure to adequately explore the possibility that the majority of CVAs may be spontaneous, cumulative, or caused by factors other than spinal manipulation itself. The problem is only exacerbated by the sometimes hysterical reactions apparent in the mass media over the past three years in reaction to the flawed investigations. This paper was presented Friday June 20, 2003 at the International Spinal Trauma Conference in Chicago, IL.

2003 - What are the Risks of Chiropractic Neck Treatments?

William J. Lauretti, DC

http://www.chiro.org/LINKS/FULL/What are the Risk of Chiropractic.shtml Every published study which has estimated the incidence of stroke (CVA) from cervical manipulation has agreed that the risk is 1 to 3 incidents per million treatments. Dvorak, in a survey of 203 practitioners of manual medicine in Switzerland, found a rate of one serious complication per 400,000 cervical manipulations, without any reported deaths, among an estimated 1.5 million cervical manipulations. Jaskoviak reported approximately 5 million cervical manipulations from 1965 to 1980 at The National College of Chiropractic Clinic in Chicago, without a single case of vertebral artery stroke or serious injury.

2003 - Association of Internal Carotid Artery Dissection and Chiropractic Manipulation

Neurologist 2003 (Jan);9 (1):35-44

http://w3.palmer.edu/michael.haneline/ICAD_Haneline.pdf

In reviewing the cases of internal carotid dissection potentially related to CMT, there were many confounding factors, such as connective tissue aberrations, underlying arteriopathy, or coexistent infection that obscured any obvious causeand-effect relationship. To date there are only 13 reported cases of ICAD temporally related to CMT. Most ICADs seem to occur spontaneously and progress from local symptoms of headache and neck pain to cortical ischemic signs. Approximately one third of the reported cases were manipulated by practitioners other than chiropractic physicians, and because of the differential risk related to major differences in training and practice between practitioners who manipulate the spine, it would be inappropriate to compare adverse outcomes between practitioner groups.

2002 - Internal Forces Sustained by the Vertebral Artery During Spinal Manipulative Therapy

J Manipulative Physiol Ther 2002 (Oct); 25 (8): 504–510 http://www.ncbi.nlm.nih.gov/pubmed/12381972

SMT resulted in strains to the VA that was almost an order of magnitude lower than the strains required to mechanically disrupt it. We conclude that under normal circumstances, a single typical (high-velocity/low-amplitude) SMT thrust is very unlikely to mechanically disrupt the VA.

2002 - Uneventful Upper Cervical Manipulation in the Presence of a Damaged Vertebral Artery

J Manipulative Physiol Ther 2002 (Sept); 25 (7): 472–483 <u>http://www.chiro.org/LINKS/ABSTRACTS/Uneventful_Upper_Cervical_Manipulation.</u> <u>shtml</u>

This case report demonstrates that vigorous manipulation of the upper cervical spine is possible without injuring an already damaged vertebral artery. It is suggested that the line of drive used during the single manipulation, almost pure lateral flexion with slight rotation, was responsible for the apparent innocuous response. Guidelines for the evaluation and management of vertebral artery dissection are reviewed. Because it is currently impossible to identify patients at risk of having a dissected vertebral artery with standard in-office examination procedures, rotational manipulation of the upper cervical spine should be abandoned by all practitioners, and schools should remove such techniques from their curriculums.

2002 - Stroke, Cerebral Artery Dissection and Cervical Spine Manipulation Therapy

Journal of Neurology 2002 (Jul); 249 (8): 1098–1104 http://www.springerlink.com/content/8kmh4hbml7naqkru/

Stroke represents an infrequent adverse reaction associated with cervical spine manipulation therapy. Attempts to identify the patient at risk and the type of manipulation most likely to result in these complications of manipulation have not been successful. A retrospective review of 64 medical legal cases of stroke temporally associated with cervical spine manipulation was performed to evaluate characteristics of the treatment rendered and the presenting complaints in patients reporting these complications. Ninety two percent of cases presented with a history of head and/or neck pain and 16 (25 %) cases presented with sudden onset of new and unusual headache and neck pain often associated with other neurological symptoms that may represent a dissection in progress. The strokes occurred at any point during the course of treatment. Certain patients reporting onset of symptoms immediately after first treatment while in others the dissection occurred after multiple manipulations. There was no apparent dose-response relationship to these complications.

2002 - International Expert Debunks Stroke Consortium Chief's Claims About Link Between Stroke and Neck Adjustment

Canada Newswire; Nov 18, 2002

ORONTO, Nov 18, 2002 (Canada NewsWire via COMTEX) --

http://www.chiro.org/LINKS/ABSTRACTS/International_Expert.shtml

A leading world expert on scientific methodology and research, Dr. David Sackett, an officer of the Order of Canada and member of the Canadian Medical Hall of Fame, today described Dr. John Norris, former Chair of the Canadian Stroke Consortium, as "incompetent" in scientific research and "irresponsible" with regard to the Consortium's work attributing strokes to neck adjustment.

2002 - Clinical Perceptions of the Risk of Vertebral Artery Dissection After Cervical Manipulation: The Effect of Referral Bias

Spine J 2002 (Sep); 2 (5): 334–342 http://www.ncbi.nlm.nih.gov/pubmed/14589464

For the 10-year period 1988 to 1997, there were 23 cases of vertebral artery dissection after cervical manipulation reported to the CCPA that represents 83% of practicing chiropractors in Canada. Based on the survey, an estimated 134,466,765 cervical manipulations were performed during this 10-year period. This gave a calculated rate of vertebral artery dissection after manipulation of 1:5,846,381 cervical manipulations. Based on the number of practicing chiropractors and neurologists during the period of this study, 1 of every 48 chiropractors and one of every two neurologists would have been made aware of a vascular complication from cervical manipulation that was reported to the CCPA during their practice lifetime

2002 - Unpredictability of Cerebrovascular Ischemia Associated with Cervical Spine Manipulation Therapy: A Review of Sixty-four Cases After Cervical Spine Manipulation

Spine 2002 (Jan 1); 27 (1): 49-55

http://www.ncbi.nlm.nih.gov/pubmed/11805635

This study was unable to identify factors from the clinical history and physical examination of the patient that would assist a physician attempting to isolate the patient at risk of cerebral ischemia after cervical manipulation. Cerebrovascular accidents after manipulation appear to be unpredictable and should be considered an inherent, idiosyncratic, and rare complication of this treatment approach.

2002 - Vertebral Arteries and Cervical Rotation:Modeling and Magnetic Resonance Angiography Studies

J Manipulative Physiol Ther 2002 (Jul); 25 (6): 370-383 http://www.ncbi.nlm.nih.gov/pubmed/12183695

All 16 vertebral arteries from the 8 patients displayed no changes in their lumen dimensions with full cervical rotation, although curves in each of the arteries did change. The model and cadaveric vertebral arteries demonstrated localized compression or kinking of the vessel wall with atlanto-axial rotation contralaterally

but revealed no evidence of major contribution of stretching to stenosis.

2001 - Arterial Dissections Following Cervical Manipulation:The Chiropractic Experience

Canadian Medical Association Journal 2001 (Oct 2); 165 (7): 905–906 http://www.chiro.org/LINKS/DISCONTINUED/Arterial dissections following cervica I_manipulation.html

Following approval by the Institutional Review Board of the Canadian Memorial Chiropractic College in Toronto, Ont., a review of malpractice data from the Canadian Chiropractic Protective Association (CCPA) was carried out to evaluate all claims of stroke following chiropractic care for the 10-year period between 1988 and 1997. There are over 4500 licensed chiropractors in Canada. The likelihood that a chiropractor will be made aware of an arterial dissection following cervical manipulation is approximately 1 in 8.06 million office visits, 1 in 5.85 million cervical manipulations, 1 in 1430 chiropractic practice years and 1 in 48 chiropractic practice careers.

2001 - New Study Puts Stroke From Neck Adjustment at Less than 1 in 5 Million Adjustments

Toronto, October 12, 2001— A new Canadian study, reported in the October 2, 2001 issue of the Canadian Medical Association Journal (CMAJ), puts the risk of stroke following neck adjustment at 1 in every 5.85 million adjustments. The study, which is based on patient medical files and malpractice data from the Canadian Chiropractic Protective Association, evaluated all claims of stroke following chiropractic care for a ten year period between 1988 and 1997.

2001 - A Review of the Significant Shortcomings in the Reporting of Stroke Associated with Cervical Manipulation

Clinical Practice Guidelines, Chapter 9: Patient Safety

http://www.chiro.org/LINKS/FULL/New_Study_Puts_Stroke_From_Neck.html In the case of strokes purportedly associated with manipulation, the panel noted significant shortcomings in the literature. A summary of the relevant literature follows. For example: "In a letter to the editor of the Journal of Manipulative and Physiological Therapeutics, Myler wrote, I was curious how the risk of fatal stroke after cervical manipulation, placed at 0.00023% compared with the risk of (fatal) stroke in the general population of the United States. According to data obtained from the National Center for Health Statistics, the mortality rate from stroke in the general population was calculated to be 0.00057%. If these data are correct, the risk of a fatal stroke following cervical manipulation is less than half the risk of fatal stroke in the general population."

2001 - Chiropractic Manipulation and Stroke

Stroke 2001 (Sep); 32 (9): 2207–2208 <u>http://stroke.ahajournals.org/content/32/9/2207.full</u> This is the response to the Rothwell et al. article (Stroke 2001;32:1054) by Anthony Rosner, PhD of the FCER.

2001 - Consequences of Neck Manipulation Performed by a Nonprofessionals

Spinal Cord 2001 (Feb);39 (2):112-113

http://www.ncbi.nlm.nih.gov/pubmed/11402369

A 30-year-old man who fainted after neck manipulation by a barber and developed spinal cord and brainstem dysfunction. His MRI revealed an extramedullary, intradural dumbbell shaped mass on the right side at C1 and C2 level compressing the spinal cord.

2002 - Is Cervical Spinal Manipulation Dangerous?

J Manipulative Physiol Ther 2002 (Oct); 25 (8):504-510 http://www.ncbi.nlm.nih.gov/pubmed/12532139

It appears that the risk of cerebrovascular accidents after cervical manipulation is low, considering the enormous number of treatments given each year, and very much lower than the risk of serious complications associated with generally accepted surgery. Provided there is a solid indication for cervical manipulation, we believe that the risk involved is acceptably low and that the fear of serious complications is greatly exaggerated.

2002 - Manipulation of the Neck and Stroke:Time for More Rigorous Evidence

Medical Journal of Australia 2002 (Apr 15); 176 (8): 376-380 http://www.chiro.org/LINKS/FULL/Manipulation_of_the_Neck_and_Stroke.htm In this issue of the Journal, Ernst (page 376) reviews case reports of serious adverse events associated with cervical spine manipulation. Although Ernst acknowledges the considerable doubt about a causal relationship between the manipulation and the adverse event, he is inconsistent in suggesting that the anecdotal and uncontrolled evidence of the case reports favors the adverse events, often strokes, being an effect of manipulation. Elucidating a causal relationship calls for greater clarity, less ambivalence and generally better science in the present evidence-based climate. Thus, the important question to be answered in the light of Ernst's article is whether the association between neck manipulation and stroke is actually causal and, if so, in what direction?

2000 - Response to Vertebral Artery Dissection Study

Canadian Journal of Neurological Sciences

Anthony L. Rosner, Ph.D. ~ December 22, 2000

http://www.chiro.org/LINKS/FULL/RESPONSE_TO_VERTEBRAL_ARTERY_DISSECTI ON_STUDY.html

A recent publication addressing vertebral artery dissection in The Canadian Journal of Neurological Sciences [1] is surprisingly anecdotal and sketchy in its depiction of both the possible causes and etiology of the subject it is intended to discuss. As such, it is laden with severe methodological deficiencies which severely undercut its credibility and create misleading impressions of vertebral artery dissection and raise

more fundamental questions as to how retrospective studies should be conducted. There are at least five critical issues which need to be brought into consideration in order to more fully understand this particular study in a broader perspective.

2000 - Vertebral Artery Dissection: Warning Symptoms, Clinical Features and Prognosis in 26 Patients

Can J Neurol Sci 2000 (Nov); 27 (4): 292–296 http://www.ncbi.nlm.nih.gov/pubmed/11097518

Headache and/or neck pain followed by vertigo or unilateral facial paresthesia is an important warning sign that may precede onset of stroke by several days.

2000 - Vertebral Artery Dissection and Migraine Headaches in Children

J Child Neurol 2000 (Oct);15 (10):694-696

http://www.ncbi.nlm.nih.gov/pubmed/11063085

Risk factors for vertebral artery dissection are reviewed, with emphasis on association with migraine headaches. A review of imaging studies for the diagnosis of dissection is also presented. This case demonstrates the importance of considering arterial wall dissection in pediatric patients with a history of atypical migraines associated with new neurologic findings.

2000 - Is There a Role for Premanipulative Testing Before Cervical Manipulation?

J Manipulative Physiol Ther 2000 (Mar); 23 (3): 175–179 http://www.ncbi.nlm.nih.gov/pubmed/10771502

It appears that a positive premanipulative test is not an absolute contraindication to manipulation of the cervical spine. If the test is able to identify patients at risk for cerebrovascular accidents, we suggest patients with a reproducible positive test should be referred for a duplex examination of the vertebral artery flow. If duplex flow is normal, the patient should be eligible for cervical manipulation despite the positive premanipulative test.

2000 - A Review of the Reported Complications from Spinal Manipulation

John J. Triano, D.C., Ph.D.

http://www.chiro.org/LINKS/ABSTRACTS/Reported_Complications.shtml In general, chiropractic treatment has little associated risk. Nearly all reactions to manipulation are mild and self-limiting, lasting less than 24 hours. Rarely, significant injury can result from injudicious or inappropriate use. The incidence of serious complication is less than 1:1,000,000.

2000 - Claims of Risk From Chiropractic Care For Neck Pain Are Exaggerated Say Experts At The Texas Back InstitutePlano, TX - May 10, 2000

http://www.chiro.org/LINKS/ABSTRACTS/Stroke.shtml Periodic claims posed in the public and professional media that Chiropractic treatment to the neck poses a high risk for stroke are unwarranted say the experts at the Texas Back Institute.

2000 - Sudden Neck Movement and Cervical Artery Dissection

Canadian Medical Association Journal 2000 (Jul 11); 163:38–40 http://www.cmaj.ca/content/163/1/38.full

During the past year the Canadian Stroke Consortium, a national network of stroke physicians, has been prospectively collecting detailed information on cases of dissection of the cervical arteries. Seventy-four patients have been studied so far: their age range was 16-87 years (mean 44 years), 60% were male, and there was a predominance of vertebrobasilar artery dissections compared with carotid artery dissections (72% v. 28%). Most (81%) of the dissections were associated with sudden neck movement, ranging from therapeutic neck manipulation to a vigorous game of volleyball, but some occurred during mild exertion such as lifting a pet dog or during a bout of coughing.

c) Iatrogenic injury

Iatrogenic injury is an injury induced inadvertently by a physician or surgeon, or by medical treatment or diagnostic procedures.

"Medicine is now a high risk industry, like aviation. But, the chance of dying in an aviation accident is one in 2 million, while the risk of dying from a medical accident is one in 200!" Dr. Leape, Harvard Medical School of Public Health

A) The number of physicians in the U.S. is 700,000

B) Accidental deaths caused by Physicians per year are 120,000

C) Accidental deaths per physician is 0.171 (or 1 per 6 MDs)

(U.S. Dept. of Health Human Services)

Iatrogenic Abstracts

2010 - Money and Spinal Surgery: What Happened to the Patient?

JAMA. 2010 (Apr 7);303 (13):1259-1265

http://jama.ama-assn.org/content/303/13/1259.full?home

There is a lack of evidence-based support for the efficacy of complex fusion surgeries over conservative surgical decompression for elderly stenosis patients. There is, however, a significant financial incentive to both hospitals and surgeons to perform the complex fusions. Spinal stenosis is the most frequent cause for spinal surgery in the elderly. There has been a slight decrease in these surgeries between 2002 and 2007. However, there has also been an overall 15 fold increase in the more complex spinal fusions (360 degree spine fusions). Deyo et. al. in yesterday's issue (April 7, 2010) of the Journal of the American Medical Association concludes that "It is unclear why more complex operations are increasing. It seems implausible that the number of patients with the most complex spinal pathology increased 15-fold in just 6 years. The introduction and marketing of new surgical devices and the influence of key opinion leaders may stimulate more invasive surgery, even in the absence of new indications...financial incentives to hospitals and surgeons for more complex procedures may play a role..." There is a significant difference in mean hospital costs for simple decompression versus complex surgical fusion. The cost of decompression is \$23,724 compared to an average of \$80,888 for complex fusion. Despite the much higher cost, there is no evidence of superior outcomes and there is greater morbidity associated with the complex fusion. The surgeon is typically reimbursed only \$600 to \$800 for simple decompression and approximately ten times more, \$6,000 to \$8,000 for the complex fusion.

2008 - Development, Testing, and Findings of a Pediatric-Focused Trigger Tool to Identify Medication-Related Harm in US Children's Hospitals

Pediatrics 2008 (Apr);121 (4):e927-935

http://pediatrics.aappublications.org/content/121/4/e927.full

Adverse drug event rates in hospitalized children are substantially higher than previously described. Most adverse drug events resulted in temporary harm, and 22% were classified as preventable. Only 3.7% of these injuries were identified by using traditional voluntary reporting methods! Our pediatric-focused trigger tool is effective at identifying adverse drug events in inpatient pediatric populations. [Editorial Commentary: These findings (that only 3.7% of adverse events find their way into hospital error reports) is very alarming, and suggests that previous reports have only documented the tip of the iceberg.]

2005 - Public Citizen Petitions FDA to Take Celebrex and Bextra Off the Market

Public Citizen ~ January 24, 2005

http://www.chiro.org/LINKS/ABSTRACTS/Public_Citizen.shtml

Public Citizen today petitioned the U.S. Food and Drug Administration (FDA) to immediately remove two widely prescribed pain relievers, Celebrex and Bextra, from the market because they increase the risk of heart attacks in patients. The group also urged the FDA to cancel plans to approve two other drugs in the same class.

2004 - Medicare Patients Dying at Rate of 195,000 a Year Due to Medical Errors

HealthGrades Quality Study. Patient Safety in American Hospitals ~ July 2004 <u>http://www.seniorjournal.com/NEWS/Health/4-08-07Errors.htm</u> An average of 195,000 Medicare patients in the U.S. died due to potentially preventable, in-hospital medical errors in each of the years 2000, 2001 and 2002, according to a new study of 37 million patient records that was released in July by HealthGrades, the healthcare quality company. That's 534 people killed every day!

2004 - Prescription-related Illness--A Scandalous Pandemic

J Eval Clin Pract 2004 (Nov);10 (4):491–497

http://www.ncbi.nlm.nih.gov/pubmed/15482411

Prescribed drugs are now a major cause of morbidity and mortality, particularly in the elderly. The extent of this pandemic is described and its likely causes in primary care are identified: unnecessary prescribing, imprecise diagnosis, inadequate undergraduate and postgraduate education in pharmacology and therapeutics, the uncritical application of evidence-based medicine, the outstanding development of new drugs and their sometimes unjustified promotion. Urgent action is recommended under seven headings, by health administration, epidemiologists, medical educators and prescribing doctors.

2004 - Death by Medicine

Life Extension Magazine ~ March 2004 http://www.chiro.org/LINKS/FULL/Death By Medicine.html

No one had ever analyzed and combined ALL of the published literature dealing with injuries and deaths caused by government-protected medicine. That has now changed. A group of researchers meticulously reviewed the statistical evidence and their findings are absolutely shocking. This fully referenced report shows the number of people having in-hospital, adverse reactions to prescribed drugs to be 2.2 million per year. The number of unnecessary antibiotics prescribed annually for viral infections is 20 million per year. The number of unnecessary medical and surgical procedures performed annually is 7.5 million per year. The number of people exposed to unnecessary hospitalization annually is 8.9 million per year. The most stunning statistic, however, is that the total number of deaths caused by conventional medicine is an astounding 783,936 per year!!!

2003 - Adverse Side Effects from Medication Are Common

LE Magazine 2003 (Dec)

http://www.chiro.org/LINKS/ABSTRACTS/Adverse_Side_Effects.shtml

"This study is important because it showed that adverse drug events were found in 23% of ambulatory patients, a rate five times as high as that found in another recent study of the community-living elderly," said Dr. Gandhi. "We probably found such a high rate because we called patients directly, while other studies have relied mainly on chart review."

2002 - Severe Complication of a Commonly Prescribed Drug:Minocycline-Induced Lupus

J Am Board Fam Pract 2002 (May);15 (3):239–241 http://www.jabfm.org/cgi/reprint/15/3/239

The constellation of symptoms that includes persistent fever, weight loss, general malaise with rash, myalgias, and arthritis brings a number of serious conditions into consideration: malignancies, connective tissue diseases, and systemic infections. Drug-induced complications also fall into this differential diagnosis. Drug-induced lupus is most commonly associated with procainamide (first described in 1962), hydralazine, chlorpromazine, isoniazid, a-methyldopa, and quinidine. From 46 to 70 drugs can cause drug-induced lupus.

2002 - Medication Errors Observed in 36 Health Care Facilities

Arch Intern Med 2002 (Sept 9);162 (16):1897-1903

http://www.ncbi.nlm.nih.gov/pubmed/12196090?dopt=Abstract

Answering 20% of the questions wrong on tests taken in school is generally considered better than average, earning a student a B or C letter grade. But when it comes to hospitals providing medication to patients, would you consider dosage mistakes made 20% of the time acceptable? In this study, one in five doses were incorrect; 7% of all dosages (or nearly 40% of errors) were deemed potentially harmful to the patient. In order of likelihood, the most frequent errors were: drugs

given at the wrong time; omission of the correct medication; incorrect dosages; or unauthorized drugs given.

2002 - Drug-induced Iatrogenic Intraparenchymal Hemorrhage

Neurosurg Clin N Am 2002 (Jul);13 (3):299-312

http://www.ncbi.nlm.nih.gov/pubmed/12486920?dopt=Abstract

Intracerebral hemorrhage is bleeding into the brain parenchyma with possible extension into the ventricles and subarachnoid space. Each year, approximately 37,000 to 52,400 people suffer from intraparenchymal hemorrhage (IPH) in the United States. This rate is expected to rise dramatically in the next few decades as a result of the increasing age of the population and a change in racial demographics. IPH accounts for 8% to 13% of all stroke cases and is associated with the highest mortality rate.

2002 - Perioperative Deaths: A Further Comparative Review of Coroner's Autopsies with Particular Reference to the Occurrence of Fatal Iatrogenic Injury

Ann Acad Med Singapore 2000 (Jul);29 (4):486-497

http://www.chiro.org/LINKS/ABSTRACTS/Perioperative_Deaths.shtml

Another article finds that approximately 2% of those admitted to a hospital experience death, as revealed at autopsy. It goes on to say that "it is not clear why initial, supposedly elective, interventions should be associated with an apparently greater risk of iatrogenic injury than those classified as emergency procedures."

2001 - Understanding NSAIDs: From Aspirin to COX-2

Clin Cornerstone 2001;3 (5):50-60

http://www.ncbi.nlm.nih.gov/pubmed/11464731

Nonsteroidal anti-inflammatory drugs (NSAIDs) annually account for 70 million prescriptions and 30 billion over-the-counter (OTC) medications sold in the United States alone. Some formulas are safe enough to be sold OTC for use in infants with fever, while others are available only as a prescription medication and are a leading cause of iatrogenic reactions, hospitalizations, and death.

2000 - A Comparison of Iatrogenic Injury Studies in Australia and the USA. II: Reviewer Behaviour and Quality of Care

Int J Qual Health Care 2000 (Oct);2 (5):79–388

http://www.ncbi.nlm.nih.gov/pubmed/11079217

This article found that approximately 2% of those admitted to a hospital experience major disability and/or death.

1998 - Incidence of Adverse Drug Reactions in Hospitalized Patients

JAMA 1998 (Apr 15);279 (15):1200-1205

http://jama.ama-assn.org/content/279/15/1200.full

Although the abstract quotes no numbers in the text, the body of the article states "that more than 2 million Americans become seriously ill every year from reactions to drugs that were correctly prescribed and taken, and that 106,000 Americans die annually from those side effects." (emphasis added) <u>A related JAMA Editorial in</u> <u>the same issue</u> also states that "ADRs may be the fourth to sixth leading cause of death, and that drug-related injuries occur in 6.7% of hospitalized patients."

1997 - Prescribing of Nonsteroidal Anti-inflammatory Drugs in General Practice: Determinants and Consequences

Aliment Pharmacol Ther 1997 (Apr);11 (2):293–298 <u>http://www.ncbi.nlm.nih.gov/pubmed/9146765</u> The data are compatible with 1 hospital admission per 2823 NSAID prescriptions (95% confidence intervals 2098-8110) and they emphasize the need for strategies to reduce levels of NSAID prescribing.

d) Chiropractic in the Military

2003 - Testimony to the department of veteran's affairs' chiropractic advisory committee

Foundation for Chiropractic Education and Research ~ March 25, 2003; George B. McClelland, D.C.,

http://www.chiro.org/LINKS/ABSTRACTS/Testimony to the Department of Vetera ns_Affairs.shtml

From a number of studies, there is little to contradict the assertion that patient satisfaction with chiropractic care, in a variety of settings, has consistently been high. Indeed, for matched back pain conditions, patient satisfaction with chiropractic treatment has invariably been shown to be significantly greater than that with conventional management [administered by a primary care physician, an orthopedist, or an HMO provider]. Satisfied patients are far more likely to be compliant in their treatment, theoretically bestowing chiropractic patients with yet another advantage over treatment by other providers in terms of outcomes

In November 2000, President Bill Clinton signed the National Defense Authorization Act for Fiscal Year 2001. The legislation included a historic provision requiring access to chiropractic services for active-duty personnel and full implementation of chiropractic benefits over a five-year period in all service branches of the military; and mandated that the Department of Defense develop an implementation plan to ensure adequate provision of those benefits.

Since the introduction of chiropractic services to the Veterans Health Administration (VA) in 2004, there have been a number of developments at the national and local levels. One development of much success and pride is the academic affiliations for training chiropractic students.

Part of the VA's mission is to promote excellence in the education of future health care professionals. This educational effort is led by the Office of Academic Affiliations, which oversees the training of health care professionals who will serve the needs of the VA and the nation. In 2008, more than 30,000 medical residents, over 20,000 medical students, and in excess of 50,000 other health professionals received some or all of their clinical training at VA facilities. This is accomplished through partnerships with more than 1,300 academic institutions including schools of medicine, dentistry, optometry, podiatry and nursing, among many others.

As many readers may know, chiropractic colleges are now among this group as well. As of April 2009, 17 VA facilities have established academic affiliations with 11 chiropractic colleges (see table) and several others are in development. These affiliations are not required by the law that established chiropractic services in the VA; rather, they arose from the successful work of individual VA doctors of

chiropractic, the willingness and support of the given VA facilities, and the cooperation of the affiliated chiropractic colleges.

The first such affiliation was realized in 2004, with several others initiated each year thereafter. To date, more than 500 chiropractic students have participated in VA training rotations. Under the direction of the supervising DC, chiropractic students function much like they do in a chiropractic college clinic setting, taking patient histories, performing examinations and providing treatment.

These training opportunities - called clerkships in medical education - mark a significant step in the evolution of chiropractic education. Our students are exposed to a broad patient population, hospital policies and procedures, and integrated case management strategies. A number of chiropractic colleges had developed such opportunities with other medical facilities prior to the VA program. However, at present the VA is the largest integrated health care system in which chiropractic trainees can acquire clinical skills along-side other medical professionals.

More recently (Oct. 17, 2006), President George W. Bush signed H.R.5122, the

National Defense Authorization Act for FY 2007. Section 712 calls for the Secretary of Defense to evaluate the cost and feasibility of making chiropractic services available to all active-duty military personnel, reservists, retirees and eligible dependents; and to submit a report to the House and Senate Armed Services

VA Medical Facility	Affiliated Chiropractic Educational Institution
Buffalo, N.Y.	New York Chiropractic College
Canandaigua & Rochester, N.Y.	New York Chiropractic College
Bath, N.Y.	New York Chiropractic College
West Haven & Newington, Conn.	University of Bridgeport College of Chiropractic
St. Louis	Logan College of Chiropractic
Kansas City, Mo.	Cleveland Chiropractic College Kansas City
Miami	New York Chiropractic College
West Los Angeles	Southern California University of Health Sciences
Dallas	Parker College of Chiropractic Palmer College of Chiropractic
Temple, Texas	Texas Chiropractic College
Martinsburg, W.V.	Life University Chiropractic College
Sioux Falls, S.D.	Northwestern Health Sciences University
Danville, Ill.	National University of Health Sciences

Committee by March 31, 2008.

Ft. Harrison, Mont.	Northwestern Health Sciences University
Jackson, Miss.	Palmer College of Chiropractic

H.R.5202 Mandates Chiropractic at Every VA Medical Center by 2010

Providing chiropractic benefits to the nation's veterans has been a goal of the chiropractic profession for decades, the profession finally reached its goal in January 2002, when President George W. Bush signed into law the Department of Veterans Affairs Health Care Programs Enhancement Act, which established a permanent chiropractic benefit within the Veterans Affairs health care system.

Among other things, the Health Care Programs Enhancement Act authorized the hiring of doctors of chiropractic in the VA health system, and mandated that chiropractic care be available in at least one VA medical center of each geographic service area of the Veterans Health Administration. It also called for the creation of an advisory committee, designed to assist the Secretary of Veterans Affairs in the development and implementation of the chiropractic health program.

In November 2003, the chiropractic advisory committee submitted a list of 38 recommendations to Sec. Anthony J. Principi that covered numerous aspects of chiropractic's involvement in the VA system. Included in the list were recommendations that doctors of chiropractic be "integrated into the VHA health care system as a partner in a health care team," and that chiropractic care be provided "at each of the major VHA facilities in each of the Veterans Integrated Service Networks, consistent with the VHA distance and time standards for specialty access."

In March 2004, based in part on the advisory committee's recommendations, Sec. Principi issued an order that the VA begin the inclusion of chiropractic care into the veterans health system. At the time he issued the order, Principi stated that one of his goals was "to ensure that chiropractic care is ultimately available and accessible to veterans who need it throughout the DVA system."



Volume 47 Number 1, 2010; Pages 1-6

2010 - Management of Operation Iraqi Freedom and Operation Enduring Freedom veterans in a Veterans Health Administration chiropractic clinic: A case series

Department of Veterans Affairs Connecticut Healthcare System, West Haven, CT; University of Bridgeport College of Chiropractic, Bridgeport, CT http://www.rehab.research.va.gov/jour/10/471/pdf/lisi.pdf

Abstract — Operation Iraqi Freedom/Operation Enduring Freedom (OIF/OEF) veterans commonly seek care for musculo-skeletal complaints in Veterans Health Administration (VHA) facilities. Chiropractic services for musculoskeletal conditions have recently been introduced to VHA. No reports have been published on

chiropractic care for OIF/OEF veterans. This study was designed to describe elements of the processes and outcomes of care for OIF/OEF veterans in a VHA chiropractic clinic. A retrospective review of consecutive cases consulted to one VHA chiropractic clinic was conducted.

Thirty-one cases were identified. Consultations originated in primary care and specialty clinics that commonly manage musculoskeletal conditions. Military traumatic injury and posttraumatic stress disorder were common. Adverse effects of treatment were mild and transitory. In 19 cases (61%), a pain decrease above the threshold for minimally important change was reported. This article is the first description of health services delivered to OIF/OEF veterans in a VHA chiropractic clinic. Chiropractic management was safe in these cases, and results support the hypothesis that such management may be effective in certain OIF/OIF veterans. A better understanding of the characteristics of these particular patients and the processes of care received in VHA chiropractic clinics is needed to improve the clinical care of these veterans.

e) Chiropractic and Pediatrics

ADD/ADHD:

2004 - Cervical kyphosis is a possible link to attention-deficit/hyperactivity disorder

Journal: J Manipulative Physiol Ther. 2004;27(8):e14 *Authors:* Bastecki AV, Harrison DE, Haas JW

Abstract:

Objective: To discuss the case of a patient who was diagnosed with attentiondeficit/hyperactivity disorder (ADHD) by a general practitioner and was treated with chiropractic care.

Clinical features: A 5-year-old patient was diagnosed with ADHD and treated by a pediatrician unsuccessfully with methylphenidate (Ritalin), Adderall, and Haldol for 3 years. The patient received 35 chiropractic treatments during the course of 8 weeks. A change from a 12 degrees C2-7 kyphosis to a 32 degrees C2-7 lordosis was observed after treatment. During chiropractic care, the child's facial tics resolved and his behavior vastly improved. After 27 chiropractic visits, the child's pediatrician stated that the child no longer exhibited symptoms of ADHD. The changes in structure and function may be related to the correction of cervical kyphosis.

Conclusion: The patient experienced significant reduction in symptoms. Additionally, the medical doctor concluded that the reduction in symptoms was significant enough to discontinue the medication. There may be a possible connection that correction of cervical kyphosis in patients with ADHD may produce a desirable clinical outcome.

Breastfeeding Dysfunction:

2009 - Contribution of Chiropractic Therapy to Resolving Suboptimal Breastfeeding: A Case Series of 114 Infants

Journal: J Manipulative Physiol Ther 2009;32(8):670-674

Authors: Miller JE, Miller L, et al

Summary: Miller et al also performed a clinical case series of chiropractic care for 114 infants with hospital- or lactation consultant-diagnosed nursing dysfunction. The average age at first visit was 3 weeks. All infants in the study showed some improvement, with 78% able to exclusively breastfeed after 2-5 treatments within a 2-week period.

2004 - Chiropractic evaluation and treatment of musculoskeletal dysfunction in infants demonstrating difficulty breastfeeding

Journal: J Clin Chiro Pediatrics. 2004;6(1):349-368.

Authors: Vallone S Abstract: Objective: Breastfeeding during the first year of an infant's life is currently

supported and promoted by lactation consultant, midwives, naturopaths, chiropractors and allopathic physician. In 1997, the American Academy of Pediatric and in 1998, the World Health Organization published their position papers that advocated breastfeeding as the optimal form of nutrition for infants. This study was to investigate problems interfering with a successful breastfeeding experience and to see if proper lactation management, with the chiropractor acting as a member of a multidisciplinary support team, can help to assure a healthy bonding experience between mother and infant.

Methods: 25 infants demonstrating difficulties breastfeeding were evaluated for biomechanical dysfunction potentially resulting in an inability to suckle successfully. The biomechanics of 10 breastfeeding infants without complaint were also evaluated for comparison.

Results: An overview of the infants with breastfeeding difficulty revealed imbalanced musculoskeletal action as compared to the infants without difficulty breastfeeding. Utilization of soft tissue therapies and chiropractic adjustments of the cranium and spine resulted in improved nursing in over 80% of the patients. **Conclusions**: The results of this study suggest that biomechanical dysfunction based on articular or muscular integrity may influence the ability of an infant to suckle successfully and that intervention via soft tissue work, cranial therapy and spinal adjustments may have a direct result in improving the infant's ability to suckle efficiently.

Chiropractic Pediatrics (general):

2000 - Chiropractic care of children

Journal: Arch Pediatr Adolesc Med. 2000;154:401-407 *Authors:* Lee AC, Li DH, Kemper KJ

Abstract:

Objective: To describe the practice characteristics and pediatric care of chiropractors.

Study Design: Cross-sectional, descriptive survey.

Setting: Chiropractic practices in the Boston, Mass, metropolitan area. Participants: One hundred fifty licensed chiropractors.

Main Outcome Measures: Demographics, practice characteristics, and fee structure. Practitioners were also asked about their approach to childhood immunizations and a clinical scenario. Data were analyzed using simple descriptive statistics.

Results: Ninety (60%) chiropractors responded. All were white and 65% were men. Respondents had on average 122 patient visits weekly, of which 13 (11%) were from children and adolescents. Typical visit frequency ranged from 1 to 3 times weekly. Average visit fees were \$82 and \$38 (initial and follow-up) and 49% of the fees were covered by insurance. Seventy percent of the respondents recommended herbs and dietary supplements. For pediatric care, 30% reported actively recommending childhood immunizations; presented with a hypothetical 2-week-old neonate with a fever, 17% would treat the patient themselves rather than

immediately refer the patient to a doctor of medicine, doctor of osteopathy, or an emergency facility.

Conclusions: Children and adolescents constitute a substantial number of patients in chiropractics. An estimated 420,000 pediatric chiropractic visits were made in the Boston metropolitan area in 1998, costing approximately \$14 million. Pediatric

chiropractic care is often inconsistent with recommended medical guidelines. National studies are needed to assess the safety, efficacy, and cost of chiropractic care for children.

Colic:

2009 - Long-term effects of infant colic: a survey comparison of chiropractic treatment and non-treatment groups

Journal: J Manipulative Physiol Ther 2009;32(8):635-638 *Authors:* Miller JE, Phillips HL

Summary: Research has shown that children who were colicky as infants suffer from poor behavior and disturbed sleep as toddlers. Miller et al performed a survey of parents of 117 such toddlers who had received chiropractic care as infants vs. 111 who had not received chiropractic care[iv]. They found the treated toddlers were twice as likely not to experience long-term sequelae of infantile colic, such as temper tantrums and frequent nocturnal waking. In other words, colicky infants who had received chiropractic care were twice as likely to sleep well and experience less temper tantrums in their toddler years

2008 - Comparison of the short-term effects of chiropractic spinal manipulation and occipito-sacral decompression in the treatment of infant colic: A single-blinded, randomised, comparison trial

Journal: Clinical Chiropractic 2008;11(3): 122-129 *Authors:* Browning M, Miller JE

Summary: Browning et al performed a single-blinded randomized comparison trial of the effects of spinal manipulative therapy (SMT) and occipito-sacral decompression therapy (OSD) on infants with colic[iii]. 43 infants younger than 8 weeks of age received two weeks of chiropractic care. Two weeks and four weeks after beginning treatment, the infants in both treatment groups cried significantly less and slept significantly more than prior to receiving chiropractic care.

2004 - Chiropractic management of infantile colic

Journal: Clinical Chiropractic 2004;7(4):180-186 Author: Hipperson, A

Abstract:

Objective: To present two case studies in which the complete resolution of infantile colic and associated symptoms was achieved with chiropractic treatment. This case series supports the aetiological mechanism of an imbalanced autonomic nervous system, via somatovisceral reflexes secondary to regional cranial and spinal dysfunction. In addition, they provide support towards the birth process

being a causative factor in the development of colic.

Design: A case series.

Setting: Private chiropractic practice.

Subjects: The first case involved a 7-week-old male infant presenting with medically diagnosed colic, with associated reflux and disturbed sleep, all of which were persistent since birth. The second infant, aged 10 weeks, had suffered maternally diagnosed colic for approximately 1 month. Associated symptoms included some vomiting and asymmetry with breast-feeding. Both infants

demonstrated many typical colic characteristics and had experienced birth trauma. Upper cervical, mid thoracic, sacroiliac and cranial dysfunction was recorded in both cases.

Methods: Each infant received diversified paediatric chiropractic manipulation to the areas diagnosed as dysfunctional. Treatment was provided over a 3-week period, though the intensity differed for the two infants.

Results: Complete resolution of all presenting symptoms was achieved in both instances.

Conclusions: These cases suggest a possible association between birth trauma; the development of cranial and spinal segmental dysfunction and consequential manifestation of symptoms of infantile colic. Secondly, they demonstrate chiropractic treatment successfully restoring correct spinal and cranial motion, with an associated resolution of symptoms.

Gastrointestinal Reflux and GERD:

2007 - Gastroesophageal Reflux Disease, Spinal Manipulative Therapy and Ischemic Compression: A Preliminary Study

Journal: Journal of the American Chiropractic Association 2007; Jan-Feb;44(1):7-19 Authors: Hains G, Hains F, Descarreaux M

Abstract:

Objective: The first objective was to determine if chiropractic spinal manipulative therapy and ischemic compression in the upper 2 quadrants of the abdomen resulted in clinically important changes in gastroesophageal reflux disease (GERD) symptoms in adults. The second objective was to determine if spinal manipulative therapy (SMT) alone, as well as ischemic compression alone, resulted in clinically important changes in adults.

Methods: A total of 62 adult patients with mild to severe GERD symptoms were divided into 2 groups. One group of patients received 20 treatments consisting of SMT and myofascial therapy using the ischemic compression technique. A second group of patients was randomly subdivided into 2 treatment groups. The first group received only SMT while the second group received only ischemic compression therapy. After 20 treatments, the SMT group received an additional 20 treatments consisting of ischemic compression. Changes in GERD symptoms were reported by patients in 2 questionnaires. One questionnaire recorded the patient's symptoms using numeric grading scales. The other gathered data pertaining to the patient's perceived impact of symptoms on social activities.

Results: Based on the data gathered from both questionnaires, the patients (n=22) in the group receiving SMT and ischemic compression reported an

improvement of 39% after 10 treatments, 66% after 20 treatments, 73% at 1month follow-up, and 57% at 6-month follow-up. Among the subjects receiving only ischemic compression therapy (n=27), improvements in GERD symptoms were reported to be 44% after 10 treatments, 65% after 20 treatments, 63% at 1-month (30 days) follow-up, and 67% at 6-month follow-up. Among patients receiving only SMT (n=13), improvements in the GERD symptoms were reported to be 39% after 10 treatments, 40% after 20 treatments, and 38% at 1-month follow-up. Eight of these patients agreed to then receive an additional 20 treatments consisting of only ischemic compression therapy. Data gathered at the end of the 20 treatments indicated that these patients reported an average of 71% improvement in their GERD symptoms in relation to the baseline.

Conclusions: Considering these findings, we suggest that both SMT and ischemic compression were found to be effective treatments for patients experiencing GERD symptoms, even at 6-month follow-up. Ischemic compression alone was more effective than SMT alone.

2005 - Chiropractic care of a pediatric patient with symptoms associated with gastroesophageal reflux disease

Journal: J Chiropr Educ 2005;19(1):43

Authors: Alcantara J, Anderson R

Abstract:

Objective: The purpose of this article is to describe the chiropractic care of a pediatric patient with complaints associated with Gastroesophageal reflux disease (GERD).

Clinical features: A 3-month-old girl was provided with chiropractic and cranial sacral care at the request and consent of her mother for symptoms associated with medically diagnosed GERD. The patient exhibited frequent vomiting, difficulty with breastfeeding, interrupted sleep, generalized muscle rigidity, and frequent high-pitched crying. The patient previously received chiropractic care elsewhere as well as medically prescribed Prilosec. The infant's condition was unaffected by these previous treatments to the point that the infant's condition was adversely affecting the family dynamics in a variety of ways.

Intervention and outcome: The patient was treated with site-specific, lowamplitude, high-velocity chiropractic adjustments to sites of vertebral subluxations, particularly at the atlas and the fourth thoracic vertebra. The patient was also cared for with low-force cranial sacral therapy to the mandible, temporal, and parietal cranial plates. The patient responded favourably to care with reduction in frequency of vomiting, improved feeding, decreased generalized muscle rigidity, and decreased high-pitched crying. The above notable changes were observed within four patient visits and with total resolution of symptoms within approximately 3 months of care.

Conclusion: This case study demonstrates that pediatric patients suffering from gastrointestinal disorders such as GERD may benefit from a clinical and theoretical framework of adjustments to sites of vertebral subluxations.

Pediatric Low Back Pain:

2003 - Evaluation of chiropractic management of pediatric patients with low back pain: a prospective cohort study

Journal: J Manipulative Physiol Ther. 2003 Jan;26(1):1-8 Authors: Hayden JA, Mior SA, Verhoef MJ

Abstract:

BACKGROUND: Recent epidemiologic studies have estimated that the lifetime prevalence of low back pain (LBP) in children is approximately 50%, with almost 15% of children experiencing frequent or continual pain. A literature search revealed no published studies addressing conservative treatment of childhood LBP. **OBJECTIVE**: To describe chiropractic management of LBP in patients between the ages of 4 and 18 years, as well as outcomes and factors associated with the outcomes.

METHODS: Prospective cohort study of consecutive pediatric patients with LBP seeing randomly selected chiropractors within the cities of Calgary, Alberta, and Toronto, Ontario, Canada. Follow-up data collection included the type and extent of treatment rendered and its outcome, which was measured with a 5-point subjective rating scale and a self-report pediatric visual analogue scale.

RESULTS: Fifteen chiropractors provided data on 54 consecutive pediatric patients with **LBP**. The average age of the patients was 13.1 years, 57% were male, 61% were acute, with 47% attributing onset to a traumatic event (most commonly sports-related); 24% reported an episode duration of greater than 3 months. Almost 90% of cases presented with uncomplicated mechanical LBP, most frequently diagnosed as lumbar facet dysfunction or subluxation. Patients were managed with manipulation, with a minority (7.7%) receiving some form of active management. "Important" improvement was seen in 62% and 87% on the visual analogue and subjective scales, respectively, within a 6-week course of management (Kaplan-Meier survival analysis). Patients with chronic LBP were less likely to respond within the median number of treatments (relative risk = 2.1). **CONCLUSIONS:** Patients responded favorably to chiropractic management, and there were no reported complications. Future investigations should establish the natural history and compare chiropractic management with other forms of treatment to gain knowledge about the effectiveness of chiropractic in managing pediatric LBP.

Otitis Media:

2003 - The use of osteopathic manipulative therapy as adjuvant therapy in children with recurrent acute otitis media

Journal: Arch Ped Adolesc Med 2003;157(9):861-66 *Authors:* Mills MV, Henley CE, Barnes LLB et al

Abstract:

Objective: To study effects of osteopathic manipulative treatment as an adjuvant therapy to routine pediatric care in children with recurrent acute otitis media (AOM).

Study design: Patients 6 months to 6 years old with 3 episodes of AOM in the previous 6 months, or 4 in the previous year, who were not already surgical

candidates were placed randomly into 2 groups: one receiving routine pediatric care, the other receiving routine care plus osteopathic manipulative treatment. Both groups received an equal number of study encounters to monitor behavior and obtain tympanograms. Clinical status was monitored with review of pediatric records. The pediatrician was blinded to patient group and study outcomes, and the osteopathic physician was blinded to patient clinical course.

Main outcome measures: We monitored frequency of episodes of AOM, antibiotic use, surgical interventions, various behaviors, and tympanometric and audiometric performance.

Results: A total of 57 patients, 25 intervention patients and 32 control patients, met criteria and completed the study. Adjusting for the baseline frequency before study entry, intervention patients had fewer episodes of AOM (mean group difference per month, -0.14 [95% confidence interval, -0.27 to 0.00]; P = .04), fewer surgical procedures (intervention patients, 1; control patients, 8; P = .03), and more mean surgery-free months (intervention patients, 6.00; control patients, 5.25; P = .01). Baseline and final tympanograms obtained by the audiologist showed an increased frequency of more normal tympanogram types in the intervention group, with an adjusted mean group difference of 0.55 (95% confidence interval, 0.08 to 1.02; P = .02). No adverse reactions were reported. **Conclusions:** The results of this study suggest a potential benefit of osteopathic manipulative treatment as adjuvant therapy in children with recurrent AOM; it may prevent or decrease surgical intervention or antibiotic overuse.

Safety:

2008 - Adverse effects of spinal manipulation therapy in children younger than 3 years: a retrospective study in a chiropractic teaching clinic.

Journal: J Manipulative Physiol Ther 2008;31(6):419-422 *Authors:* Miller JE, Benfield K

Summary: Miller et al examined 781 pediatric patients under 3 years of age (73.5% of whom were under 13 weeks) who received a total of 5242 chiropractic treatments at a chiropractic teaching clinic in England from 2002-2004. There were no serious adverse effects (reaction lasting >24 hours or needing hospital care) over the three-year study period. There were 7 reported minor adverse effects, such as transient crying or interrupted sleep. Though the study was not examining effectiveness, it is interesting to note that 85% of the parents reported improvement in their children's symptoms.

f) Chiropractic and Pregancy

2012 - The Treatment Experience of Patients With Low Back Pain During Pregnancy

Chiropractic & Manual Therapies 2012 (Oct 9)

Shabnam Sadr, Neda Pourkiani-Allah-Abad and Kent Jason Stuber

Canadian Memorial Chiropractic College, 6100 Leslie Street, Toronto, Ontario M2H 3 J1, Canada

Background Chiropractors regularly treat pregnant patients for low back pain during their pregnancy. An increasing amount of literature on this topic supports this form of treatment; however the experience of the pregnant patient with low back pain and their chiropractor has not yet been explored. The objective of this study is to explore the experience of chiropractic treatment for pregnant women with low back pain, and their chiropractors.

Methods This qualitative study employed semi-structured interviews of pregnant patients in their second or third trimester, with low back pain during their pregnancy, and their treating chiropractors in separate interviews. Participants consisted of 11 patients and 12 chiropractors. The interviews consisted of 10 open-ended questions for patients, and eight open-ended questions for chiropractors, asking about their treatment experience or impressions of treating pregnant patients with LBP, respectively. All interviews were audio-recorded, transcribed verbatim, and reviewed independently by the investigators to develop codes, supercodes and themes. Thematic saturation was reached after the eleventh chiropractor and ninth patient interviews. All interviews were analyzed using the qualitative analysis software N-Vivo 9.

Results Five themes emerged out of the chiropractor and patient interviews. The themes consisted of Treatment and Effectiveness; Chiropractor-Patient Communication; Pregnant Patient Presentation and the Chiropractic Approach to Pregnancy Care; Safety Considerations; and Self-Care.

Conclusions Chiropractors approach pregnant patients with low back pain from a patient-centered standpoint, and the pregnant patients interviewed in this study who sought chiropractic care appeared to find this approach helpful for managing their back pain symptoms.

2009 - Outcome of Pregnancy-Related Lumbopelvic Pain Treated According to a Diagnosis-Based Decision Rule

J Manipulative Physiol Ther 2009 (Oct); 32 (8): 616-624

Donald R. Murphy, DC, Eric L. Hurwitz, DC, PhD, Ericka E. McGovern, DC Rhode Island Spine Center, Pawtucket, RI 02860, USA.

OBJECTIVE: The purpose of this study was to describe the clinical outcomes of patients with pregnancy-related lumbopelvic pain (PRLP) treated according to a diagnosis-based clinical decision rule.

METHODS: This was a prospective observational cohort of consecutive patients with PRLP. Data on 115 patients were collected at baseline and on 78 patients at the end of the active treatment. Disability was measured using the Bournemouth Disability Questionnaire (BDQ). Pain intensity was measured using the Numerical

Rating Scale for pain (NRS). Patients were also asked to self-rate their improvement. Care was provided by a chiropractic physician/physical therapist team.

Interventions Each patient was examined and treated in the manner that would occur in ordinary clinical circumstances at the Rhode Island Spine Center. Care was provided by a chiropractic physician/physical therapist team. Details of this DBCDR approach are provided elsewhere. [8] This decision rule is designed to allow the clinician to formulate a working diagnosis upon which treatment decisions can be made.

It is based on 3 questions of diagnosis: [8]:

- 4. Are the symptoms with which the patient is presenting reflective of a visceral disorder, or a serious or potentially life-threatening disease? This question considers findings such as fever, chills or rigors, previous history of cancer and, particularly in the pregnant patient, bleeding, spotting, unusual discharge, or episodes of diarrhea. The answers to this question are sought via medical history, physical examination and, when indicated, special tests.
- 5. **From where is the patient's pain arising?** This question considers signs suggestive of pain arising from disk, joint, nerve, or muscle. The following signs were considered:

a. **Centralization signs:** these are thought to arise from disk pain and were evaluated via historical factors13 as well as the end-range loading examination that is part of the McKenzie system. [14]

b. **Segmental pain provocation signs:** these are thought to arise from joint pain and were evaluated via historical factors13, 15 as well as pain provocation tests. [13, 16-18]

c. **Neurodynamic signs:** these are thought to arise as a result of pain from neural structures, particularly the nerve root, and were evaluated via historical factors, nerve root provocation tests, [19, 20] and neurologic examination.

d.**Myofascial signs:** there are thought to arise from myofascial trigger points and were evaluated via trigger point palpation. [21]

6. What has gone wrong with this person as a whole that would cause the pain experience to develop and persist? This question considers factors that have the potential to perpetuate the pain experience. The following factors were considered:

a. **Dynamic instability of the lumbar spine or pelvis:** this is thought to arise from impairment of the motor control system [22] and was evaluated with examination procedures such as the hip extension test, [23] the segmental instability test, [24] and the active straight leg raise test. [25]

b. **Central pain hypersensitivity:** this is thought to arise from sensitization of neurons involved in the transmission, relay, localization, and emotional response to nociception as well as deficit the nociceptive inhibitory mechanisms [26] It was detected with assessment of nonorganic signs. [27]

c. **Psychological issues such as fear, catastrophizing, passive coping, or depression.** These psychological responses to the pain experience that are maladaptive and can interfere with recovery. [28]

They were be detected via patient interview and the Fear Avoidance Beliefs Questionnaire. [28]

From the working diagnosis derived from the answers to these 3 questions, a management strategy was formulated that was designed to address each of the factors the clinician felt was most relevant (Fig 2). In the context of the DBCDR, the responses to the 3 questions of diagnosis were:

Question 1:

Further investigation or referral. These patients fell outside the scope of the present study.

Question 2:

Centralization signs: end-range loading maneuvers in the direction of centralization of symptoms [14]; distraction manipulation. [30, 31]

Segmental pain provocation signs: lumbar or sacroiliac joint mobilization or manipulation. [32] The method used was at the discretion of each practitioner; however, the most commonly used technique was high-velocity, low-amplitude manipulation performed in the side lying position. In those patients in whom the size of the abdomen made it difficult or uncomfortable to perform manipulation in the side posture position, the typical alternative treatment was oscillatory mobilization with the patient in the prone position and wedges positioned under the pelvis to attempt to counter rotation the ilia. In these cases, the abdominal piece of the table was dropped out to accommodate the abdomen.

Neurodynamic signs: neural mobilization. [20]

Myofascial signs: myofascial therapies. [33]

Question 3:

Dynamic instability: stabilization exercise. [34, 35]

Central pain hypersensitivity: education and graded exposure. [36] **Psychological factors:** counseling, education, and graded exposure. [37] With this approach the response to treatment is monitored on each visit and the diagnosis and/or treatment is modified depending on this response.

RESULTS: Fifty-seven patients (73%) reported their improvement as either "excellent" or "good." The mean patient-rated improvement was 61.5%. The mean improvement in BDQ was 17.8 points. The mean percentage of improvement in BDQ was 39% and the median was 48%. Mean improvement in pain was 2.9 points. Fifty-one percent of the patients had experienced clinically significant improvement in disability and 67% patients had experienced clinically significant improvement in pain. Patients were seen an average 6.8 visits. Follow-up data for an average of 11 months after the end of treatment were collected on 61 patients. Upon follow-up, 85.5% of patients rated their improvement as either "excellent" or "good." The mean patient-rated improvement was 83.2%. The mean improvement in BDQ was 28.1 points. The mean percentage of improvement in BDQ was 68% and the median was 87.5%. Mean improvement in pain was 3.5 points. Seventy-three percent of the patients had experienced clinically significant improvement in disability and 82% patients had experienced clinically significant improvement in pain.

CONCLUSIONS: The management strategy used in this study appeared to yield favorable outcomes in this patient population and appears to be a safe option for patients with PRLP, although because of this study's sample size, rare complications are not likely to be detected. In addition, the absence of randomization and a control group limits interpretation with regard to clinical effectiveness.

Historical Perspective (Pre 2000)

Government Studies on Chiropractic

There have been a number of large investigations conducted on chiropractic by the American, Canadian, New Zealand, Swedish and Australian governments over the last few decades. In all cases, their findings have supported the effectiveness and efficacy of Chiropractic.

Canada's 1993 Manga Report strongly recommended chiropractic care over medical care for the treatment and management of most low-back conditions. The 1994 AHCPR Study from the U.S. Department of Health and Human Services suggested that chiropractic spinal manipulation was a conservative and safe treatment for many low-back conditions and should be utilized prior to any surgical interventions in most cases.

Doctors of Chiropractic have now become integral to the development of governmental guidelines for the treatment of back conditions in Canada and the U.S. In addition, many hospitals are extending privileges to chiropractors and referrals between medical doctors and chiropractors are becoming increasingly common.

1993 - The Oakland University Study

After reviewing the health insurance claims for 395,641 chiropractic and medical care patients, Miron Stano, Ph.D., lead researcher Oakland University, concluded:

- Those patients who receive chiropractic care, either solely or in conjunction with medical care, experienced "significantly lower health care costs... on the order of \$1,000 each over the two-year period" compared with those who received only medical care. Specifically, total insurance payments were \$1,138 (30% higher) for those who elected medical care only.
- The lower costs for chiropractic patients were attributable both to lower inpatient and outpatient costs and indicated that "chiropractic treatment substitutes for other forms of outpatient care." Stano/Medstat Research. Miron Stano, Ph.D. Oakland University.

1992 - Virginia Comparative Study

A 1992 study conducted by L.G. Schifrin, Ph.D., provided an economic assessment of mandated health insurance coverage for chiropractic treatment within the Commonwealth of Virginia. As reported by the College of William and Mary, and the Medical College of Virginia, the study indicated that chiropractic provides therapeutic benefits at economical costs. The report also recommended that chiropractic be a widely available form of health care.

1992 - America Health Policy Report

A 1992 review of data from over 2,000,000 users of chiropractic care in the U.S., reported in the Journal of American Health Policy, stated that chiropractic users tend to have substantially lower total health care costs, and chiropractic care reduces the use of both physician and hospital care.

1992 - Rand Study on Low Back Pain

A four-phase study conducted in the early 1990s by RAND, one of America's most prestigious centers for research in public policy, science and technology, explored many indications of low-back pain. In the RAND studies, an expert panel of researchers, including medical doctors and doctors of chiropractic, found that:

- Chiropractors deliver a substantial amount of health care to the U.S. population.
- Spinal manipulation is of benefit to some patients with acute low-back pain.

The RAND reports marked the first time that representatives of the medical community went on record stating that spinal manipulation is an appropriate treatment for certain low-back pain conditions.

1992 - Patient Disability Comparison

A 1992 article in the Journal of Family Practice reported a study by DC Cherkin, Ph.D., which compared patients of family physicians and of chiropractors. The article stated the number of days of disability for patients seen by family physicians was significantly higher (mean 39.7) than for patients managed by chiropractors (mean 10.8). A related editorial in the same issue referred to risks of complications from lumbar manipulation as being very low.

1992 - The Virginia Research Study

An economic analysis conducted in Richmond, Virginia in 1992 found chiropractic care to be a lower cost option for back-related ailments. The researchers concluded that if chiropractic care was insured to the extent of other medical specialties, it would likely emerge as a first option for many patients with certain medical conditions. They also believed this could result in a decrease in the overall treatment costs for these conditions.

Additional research conducted by The College of William and Mary and the Medical

College of Virginia in 1992 on mandated health insurance coverage and the economic impact of chiropractic coverage revealed:

 The low cost of chiropractic is due not to its low rate of use, but to its apparently offsetting impacts on costs in the face of high rates of utilization. Chiropractic is a growing component of the health care sector, and it is widely used by the population.

- Formal studies of the cost, effectiveness, or both of chiropractic, usually measured against other forms of treatment, show it to compare favorably with them.
- By every test of cost and effectiveness, the general weight of evidence shows chiropractic to provide important therapeutic benefits, at economical costs. Additionally, these benefits are achieved with apparently minimal, even negligible, impacts on the costs of health insurance.
- The conclusion of this analysis is that chiropractic mandates help make available health care that is widely used by the American public and has proven to be cost-effective.
- A Comparison of the Costs of Chiropractors versus Alternative Medical Practitioners. Dean DH, Schmidt RM. University of Richmond, Richmond, Virginia January 13, 1992.
- Mandated Health Insurance Coverage for Chiropractic Treatment: An Economic Assessment, with Implications for the Commonwealth of Virginia. Schifrin LG. The College of William and Mary, Williamsburg, Virginia, and Medical College of Virginia, Richmond, Virginia - January 1992.

1992 - The Australia Study²

In this Australian study, 1,996 workers' compensation cases were evaluated in patients who experienced work-related mechanical low back pain. It was found that those individuals who received chiropractic care for their back pain returned to work 4 times faster (6.26 days vs. 25.56 days) and had treatment that cost 4 times less (\$392 vs. \$1,569) than those who received treatments from medical doctors. Also, in those patients who received chiropractic care there was a significantly lower incidence of progression to a chronic low back pain status.

 Mechanical Low-Back Pain: A Comparison of Medical and Chiropractic Management Within the Victorian Work Care Scheme. Ebrall, PS. Chiropractic Journal of Australia - 1992;22:47-53.

1990 - Landmark Legal Decision Supports Chiropractic

Further validation of chiropractic care evolved from an antitrust suit which was filed by four members of the chiropractic profession against the American Medical Association (AMA) and a number of other health care organizations in the U.S. (Wilk et al v. AMA et al, 1990). Following 11 years of litigation, a federal appellate court judge upheld a ruling by U.S. District Court Judge Susan Getzendanner that the AMA had engaged in a lengthy, systematic, successful and unlawful boycott designed to restrict cooperation between MDs and chiropractors in order to eliminate the profession of chiropractic as a competitor in the U.S. health care system. Judge Getzendanner rejected the AMAs patient care defense, and cited scientific studies which implied that chiropractic care was twice as effective as medical care in relieving many painful conditions of the neck and back as well as related musculo-skeletal problems. Since the courts findings and conclusions were released, an increasing number of medical doctors, hospitals, and health care organizations in the U.S. have begun to include the services of chiropractors.

1990 - British Medical Journal Report

A study conducted by T.W. Meade, a medical doctor, and reported in the June 2, 1990, British Medical Journal concluded after two years of patient monitoring, for

patients with low-back pain in whom manipulation is not contraindicated; chiropractic almost certainly confers worthwhile, long-term benefit in comparison with hospital outpatient management.

1989 – Washington HMO Study

In 1989, a survey administered by Daniel C. Cherkin, Ph.D., and Frederick A. MacCornack, Ph.D., concluded that patients receiving care from health maintenance organizations (HMOs) within the state of Washington were three times as likely to report satisfaction with care from chiropractors as they were with care from other physicians. The patients were also more likely to believe that their chiropractor was concerned about them.

1988 - The Florida Study

This large State of Florida study examined 10,652 patients who sustained backrelated injuries on the job. Their findings revealed that individuals who received chiropractic care compared with standard medical care for similar diagnoses experienced had a (i) 51.3 percent shorter temporary total disability duration (ii) lower treatment cost by 58.8 percent (\$558 vs. \$1,100 per case) (iii) 20.3 percent hospitalization rate in the chiropractic care group vs. 52.2 percent rate in the medical care group.

 An Analysis of Florida Workers' Compensation Medical Claims for Back Related Injuries. Wolk S. Foundation for Chiropractic Education and Research, Arlington, VA. - 1988.

1988 - The Utah Study

In 1988 a Utah Workers' Compensation Board study found the <u>total treatment costs</u> for back-related injuries cost an average of \$775.30 per case when treated by a doctor of chiropractic. When injured workers received standard medical treatment as opposed to chiropractic treatment, the average cost per case was \$1,665.43.

They also found the <u>mean compensation cost</u> paid out by the Utah Worker's Compensation Board for patients treated by medical doctors was \$668.39, while the mean compensation cost paid for patients treated by chiropractic doctors was only \$68.38.

- Cost per Case Analysis of Utah Industrial Back Injury Claims: Chiropractic Management vs. Medical Management for Diagnostically Equivalent Conditions. D.C. Tracts - 1989.
- Cost per Case Comparison of Back Injury Claims of Chiropractic versus medical Management for Conditions with Identical Diagnostic Codes. Jarvis KB, et al. Journal of Occupational Medicine - 1991;33:847-852.

1987 - The Sweden Report

Up until the late 1980's, Sweden had no legislation regulating the practice of chiropractic, although there were approximately 100 chiropractors in Sweden educated in accredited chiropractic colleges. In 1987, a commission on Alternative Medicine in Sweden conducted a detailed investigation of chiropractic education. They had the scientific literature assessed by university medical faculty and additionally commissioned a demographic survey by Statistics Sweden. Subsequent to the report, the Swedish government passed legislation recognizing and regulating the chiropractic profession in Sweden. Then, together with the governments from Denmark, Finland and Norway, it established a school of chiropractic at the University of Odense in Denmark to provide a regional chiropractic college for students from those countries.

The report's findings included:

Doctors of chiropractic should become registered practitioners and be brought within the national insurance system in Sweden; Training for Doctors of Chiropractic follows a 4-5 year course of university level training and was found to be the equivalent to Swedish medical training - chiropractors have "competence in differential diagnosis" and should be regulated on a primary care basis"; "Measures to improve cooperation between chiropractors, registered medical practitioners and physiotherapists are vital" in the public interest.

• Ref 11 Supra.

1985 - University of Saskatchewan Study

In 1985 the University of Saskatchewan conducted a study of 283 patients who had not responded to previous conservative or operative treatment and who were initially classified as totally disabled. The study revealed that 81% ... became symptom free or achieved a state of mild intermittent pain with no work restrictions after daily spinal manipulations were administered

1984 - The Australia Report¹

In July of 1984 the Australian Federal Minister for Health asked their Medicare Benefits Review Committee to "consider requests for extending the scope of Medicare (government-funded health care) arrangements to provide benefits for certain paramedical services" - which included chiropractic services.

The Committee recommended funding for chiropractic in hospitals and other public institutions, and stated:

"We are aware of the very considerable organizational and professional obstacles... orthodox practitioners and, indeed, some chiropractors may initially find the experience an uneasy one, but we consider the differences that currently exist to be unreasonable and efforts should be made to bridge the gap." "... the continuing schism between the two professions does little to help improve the health of the many Australians who might benefit from a joint chiropractic/medical approach to their problems."

• Second Report Medicare Benefits Review Committee. Thompson CJ. Commonwealth Government Printer, Canberra, Australia, Chapter 10 (Chiropractic) - June 1986.

1978 - 1980 The New Zealand Commission Report

This 377 page report, *Chiropractic in New Zealand*, was the most comprehensive and detailed independent examination of chiropractic ever undertaken at that time. The report withstood judicial hearings and extensive investigations by the Commission in New Zealand, the United States, Canada, England and Australia.

According to the researchers, "We entered into our inquiry in early 1978. We had no clear idea what might emerge. We knew little about chiropractors. None of us had undergone any personal experience of chiropractic treatment. If we had any general impression of chiropractic it was probably that shared by many in the community: that chiropractic was an unscientific cult, not to be compared with orthodox medical or paramedical services. We might well have thought that chiropractors were people with perhaps a strong urge for healing, who had for some reason not been able to get into a field recognized by orthodox medicine and who had found an outlet outside the fringes of orthodoxy."

"But as we prepared ourselves for this inquiry it became apparent that much lay beneath the surface of these apparently simple terms of reference. In the first place it transpired that for many years chiropractors had been making strenuous efforts to gain recognition and acceptance as members of the established health care team. Secondly, it was clear that organized medicine in New Zealand was adamantly opposed to this on a variety of grounds which appeared logical and responsible. Thirdly, however, it became only too plain that the argument had been going on ever since chiropractic was developed as an individual discipline in the late 1800's, and that in the years between then and now the debate had generated considerable more heat than light."

"By the end of the inquiry we found ourselves irresistibly and with complete unanimity drawn to the conclusion that modern chiropractic is a soundly based and valuable branch of the health care in a specialized area..."

Their report includes the following findings:

Chiropractic is a branch of the healing arts specializing in the correction by spinal manual therapy of what chiropractors identify as biomechanical disorders of the spinal column - they carry out spinal diagnosis and therapy at a sophisticated and refined level; Chiropractors are the only health practitioners who are necessarily equipped by their education and training to carry out spinal manual therapy; General medical practitioners and physiotherapists have no adequate training in spinal manual therapy; Spinal manual therapy in the hands of a registered chiropractor is safe; The education and training of a registered chiropractor are sufficient to enable him/her to determine whether there are contraindications to spinal manual therapy in a particular case, and whether the patient should have medical care instead of or as well as chiropractic care.

Spinal manual therapy can be effective in relieving musculoskeletal symptoms, such as back pain and other symptoms known to respond to such therapy, such as migraine; In a limited number of cases where there are organic and/or visceral symptoms, chiropractic treatment may provide relief, but this is unpredictable, and in such cases the patient should be under concurrent medical care if that is practicable; In the public interest and in the interests of patients, there must be no impediment to full professional cooperation between chiropractors and medical practitioners; It is wrong that the present law, or any medical ethical rules, should have the effect that a patient can receive spinal manual therapy which is subsidized by a health benefit only from those health professionals least qualified to deliver it; The responsibility for spinal manual therapy training, because of its specialized nature, should lie with the chiropractic profession and part-time or vacation courses in spinal manual therapy for other health professionals should not be encouraged.

• New Zealand Report. Hasselberg PD. Government Printer, Wellington - 1979.

Effectiveness (Pre 2000)

1999 - Vertebral Artery Flow and Cervical Manipulation: An Experimental Study

J Manipulative Physiol Ther 1999 (Sep); 22 (7): 431–435 http://www.ncbi.nlm.nih.gov/pubmed/10519558

We present an experimental model for investigations of vertebral artery hemodynamics during biomechanical interventions. We found a modest and transient effect of cervical manipulation on vertebral artery volume flow. The model may have further applications in future biomechanical research, for example, to determine whether any of several spinal manipulative techniques imposes less strain on the vertebral artery, thereby reducing possible future cerebrovascular accidents after such treatment.

1999 - Vertebral Artery Volume Flow in Human Beings

J Manipulative Physiol Ther 1999 (Jul); 22 (6): 363–367 http://www.ncbi.nlm.nih.gov/pubmed/10478767

This appears to be the first in vivo Doppler study on human vertebral artery volume blood flow. Our results indicate that in symptom-free subjects there is no change in vertebral artery perfusion during rotation in spite of significant changes in flow velocity.

1999 - Risk Factors and Precipitating Neck Movements Causing Vertebrobasilar Artery Dissection After Cervical Trauma and Spinal Manipulation

Spine 1999 (Apr 15);24 (8):785-794

http://www.ncbi.nlm.nih.gov/pubmed/10222530

The literature does not assist in the identification of the offending mechanical trauma, neck movement, or type of manipulation precipitating vertebrobasilar artery dissection or the identification of the patient at risk. Thus, given the current status of the literature, it is impossible to advise patients or physicians about how to avoid vertebrobasilar artery dissection when considering cervical manipulation or about specific sports or exercises that result in neck movement or trauma.

1999 - Perspectives: An Overview of Comparative Considerations of Cerebrovascular Accidents

Chiropractic Journal of Australia 1999;29 (3):87–102 http://www.chiro.org/LINKS/CVA/CVA_Perspectives.shtml

This paper seeks to contrast reports concerning major adverse side effects, viz. cerebrovascular accidents (CVAs) attributed to cervical spine manipulation, within a broad perspective of medical procedures. It also seeks to correlate the incidence rates of other adverse events and medical procedures with the general incidence rate of CVAs. On analysis, an accurate position would indicate that cervical spinal manipulation is one of the more conservative, least invasive and safest of procedures in the provision of human health care services. The paper also alludes to the political connotations on the subject.

1999 - Chiropractic Management of Migraine Without Aura: A Case Study

Australasia Chiropractic and Osteopathic Journal 1999 (Nov): 8 (3) http://www.chiro.org/LINKS/ABSTRACTS/Migraine_Without_Aura.shtm

It now appears clear that chiropractic care may be used to assist patients with migraine. Research is currently being undertaken to investigate the potential mechanisms of chiropractic in the treatment of migraine. This research should also assess what (if any) prognostic signs can be identified to assist practitioners making a more informed decision on the treatment of choice for migraine.

1999 - A Twelve Month Clinical Trial of Chiropractic Spinal Manipulative Therapy for Migraine

Australasia Chiropractic and Osteopathic Journal 1999 (Jul):8 (2) http://www.chiro.org/LINKS/ABSTRACTS/Twelve_Month.shtml

32 participants showed statistically significant (p < 0.05) improvement in migraine frequency, VAS, disability, and medication use, when compared to initial baseline levels. A further assessment of outcomes after a six month follow up (based on 24 participants), continued to show statistically significant improvement in migraine frequency (p < 0.005), VAS (p < 0.01), disability (p < 0.05), and medication use (p < 0.01), when compared to initial baseline levels.

1999 - Clinical Study on Manipulative Treatment of Derangement of the Atlantoaxial Joint

J Tradit Chin Med 1999 (Dec);19 (4):273–278 http://www.ncbi.nlm.nih.gov/pubmed/10921131

The derangement of the atlantoaxial joint is one of main cervical sources of dizziness and headache, which were based on the observation on the anatomy of the upper cervical vertebrae, analysis of X-ray film of the atlantoaxial joint, and the manipulative treatment in 35 patients with cervical spondylosis.

1999 - Spinal Pain Syndromes:

Nociceptive, Neuropathic, and Psychologic Mechanisms

J Manipulative Physiol Ther 1999 (Sep);22 (7):458–472 http://www.ncbi.nlm.nih.gov/pubmed/10519563

Although the treatment of neuropathic pain is difficult, sufficient evidence in the literature demonstrates that the treatment of nociceptive pain should be multimodal and involve spinal manipulation, muscle lengthening/stretching, trigger point therapy, rehabilitation exercises, electrical modalities, a variety of nutritional factors, and mental/emotional support.

1999 - Chronic Spinal Pain Syndromes: A Clinical Pilot Trial Comparing Acupuncture, A Nonsteroidal Anti-inflammatory Drug, and Spinal Manipulation

J Manipulative Physiol Ther 1999 (Jul);22 (6):376–381 http://www.ncbi.nlm.nih.gov/pubmed/10478769 The consistency of the results provides, in spite of several discussed shortcomings of this pilot study, evidence that in patients with chronic spinal pain syndromes spinal manipulation, if not contraindicated, results in greater improvement than acupuncture and medicine

1998 - Dysafferentation: A Novel Term to Describe the Neuropathophysiological Effects of Joint Complex Dysfunction. A Look at Likely Mechanisms of Symptom Generation

J Manipulative Physiol Ther 1998 (May);21 (4):267-280

http://www.chiro.org/ChiroZine/ABSTRACTS/Seaman_dysafferentiation.shtml Joint complex dysfunction should be included in the differential diagnosis of pain and visceral symptoms because joint complex dysfunction can often generate symptoms which are similar to those produced by true visceral disease.

1998 - Risk Assessment of Neurological and/or Vertebrobasilar Complications in the Pediatric Chiropractic Patient

Journal of Vertebral Subluxation Research (JVSR) 1998; 2 (2): 73–78 <u>http://www.chiro.org/pediatrics/ABSTRACTS/Risk_Assessment_in_Pediatric_Chiropractic_Patient.shtml</u>

The estimate of risk due to the pediatric chiropractic patient in this category of complication was estimated to be 4.0×10 -7 % of all visits. Stated otherwise, there would be a chance of approximately 1 in 250 million pediatric visits that a N/VB complication would result. While some pre-existing conditions may predispose a pediatric patient to a higher incidence of such complications, the estimates derived in the present study are considered applicable to the general pediatric population.

1998 - Vertebral Artery Flow and Spinal Manipulation: A Randomized, Controlled and Observer Blinded Study

J Manipulative Physiol Ther 1998 (Mar); 21 (3): 141–144 http://www.ncbi.nlm.nih.gov/pubmed/9567231

To the best of our knowledge, this is the first study comparing flow velocity in the vertebral artery before and after spinal manipulative therapy. We found no significant changes in otherwise healthy subjects with a biomechanical dysfunction of the cervical spine.

1998 - Efficacy and Risks of Chiropractic Manipulation:What Does the Evidence Suggest?

Integrative Medicine 1998; 1: 61-66

http://www.chiro.org/LINKS/ABSTRACTS/Efficacy and Risks of Chiropractic.shtml This review article drew upon the appropriateness studies conducted at RAND, which indicated efficacy of manipulation for acute or sub-acute low back pain, neck pain, and muscle-tension-type headaches. The article also reported the low risk of serious complications from lumbar and cervical manipulations. According to the literature review, the estimated risk for serious complications from cervical manipulation is 6.39 per 10 million manipulations. For lumbar manipulation, it is 1 per 100 million manipulations. These estimates compare favorably to other forms of therapy, such as cervical spine surgery or nonsteroidal anti-inflammatory drugs (NSAIDS). The risk from manipulation is low and compares favorably to other forms of therapy for the same conditions (e.g., 15.6

complications per 1000 cervical spine surgeries, 3.2 per 1000 subjects for nonsteroidal anti-inflammatory drugs)

1997 - The Effect of Spinal Manipulation in the Treatment of Cervicogenic Headache

J Manipulative Physiol Ther 1997 (Jun); 20 (5): 326–330 http://www.ncbi.nlm.nih.gov/pubmed/9200048

The use of analgesics decreased by 36% in the manipulation group, but was unchanged in the soft-tissue group. The number of headache hours per day decreased by 69% in the manipulation group, compared with 37% in the soft-tissue group. Finally, headache intensity per episode decreased by 36% in the manipulation group, compared with 17% in the soft-tissue group.

1997 - The Chiropractic Outcome Study: Pain, Functional Ability and Satisfaction With Care

J Manipulative Physiol Ther 1997 (May);20 (4):235–240 http://www.ncbi.nlm.nih.gov/pubmed/9168407

Based on these results, it seems that patients suffering from back and/or neck complaints experience chiropractic care as an effective means of resolving or ameliorating pain and functional impairments, thus reinforcing previous results showing the benefits of chiropractic treatment for back and neck pain.

1997 - The Benefits and Risks of Spinal Manipulation

Paul G. Shekelle, MD, PhD; Reed B. Phillips, DC, PhD; Daniel C. Cherkin, PhD; William C. Meeker, DC, MPH

http://www.chiroweb.com/archives/ahcpr/chapter11.htm

This chapter summarizes what has been learned from clinical trials about the benefits of spinal manipulation for specific problems and from case reports about the risks of spinal manipulation. In addition, findings of studies examining the ability of spinal manipulation to increase patient satisfaction, decrease cost, or increase cost-effectiveness of care are summarized. This is the 11th chapter of "Chiropractic in the United States: Training, Practice, and Research", a publication (Dec 1997) by the Agency for Health Care Policy and Research (AHCPR).

1997 - The Effects of Spinal Manipulation on Cervical Kinesthesia in Patients With Chronic Neck Pain: A Pilot Study

J Manipulative Physiol Ther 1997 (Feb);20 (2):80–85 http://www.ncbi.nlm.nih.gov/pubmed/9046455

Subjects receiving manipulation demonstrated a mean reduction in visual analogue scores of 44%, along with a 41% improvement in mean scores for the head repositioning skill. In comparison, a 9% mean reduction in visual analogue scores and a 12% improvement in head repositioning scores was observed for the

stretching group. The difference in the outcomes of the head repositioning skill scores was significant (p < or = .05).

1996 - Manipulation and Mobilization of the Cervical Spine. A Systematic Review of the Literature

Spine 1996 (Aug 1); 21 (15): 1746–1760 http://www.ncbi.nlm.nih.gov/pubmed/8855459

The combination of three of the randomized controlled trials comparing spinal manipulation with other therapies for patients with subacute or chronic neck pain showed an improvement on a 100-mm visual analogue scale of pain at 3 weeks of 12.6 mm (93% confidence interval, -0.15, 25.5) for manipulation compared with muscle relaxants or usual medical care. The highest quality randomized controlled trial demonstrated that spinal manipulation provided short-term relief for patients with tension-type headache. The complication rate for cervical spine manipulation is estimated to be between 5 and 10 per 10 million manipulations.

1996 - Safety in Chiropractic Practice, Part I: The Occurrence of Cerebrovascular Accidents After Manipulation to the Neck in Denmark from **1978–1988**

J Manipulative Physiol Ther 1996 (Jul); 19 (6): 371–377 http://www.ncbi.nlm.nih.gov/pubmed/8864967

Although the incidence of CVA after chiropractic SMT was confirmed to be low, there seems to be sufficient evidence to justify a firm policy statement cautioning against upper cervical rotation as a technique of first choice.

1996 - Safety in Chiropractic Practice Part II: Treatment to the Upper Neck and the Rate of Cerebrovascular Incidents

J Manipulative Physiol Ther 1996 (Nov); 19 (9): 563–569 http://www.ncbi.nlm.nih.gov/pubmed/8976474

Retrospective data were collected from questionnaires covering the period 1978-1988 inclusive; in a second survey, chiropractors provided information obtained through inspection of their own case records.

1996 - Manipulation and Mobilization of the Cervical Spine. A Systematic Review of the Literature

SPINE (Phila Pa 1976) 1996 (Aug 1); 21 (15): 1746–1760 http://www.ncbi.nlm.nih.gov/pubmed/8855459

The combination of three of the randomized controlled trials comparing spinal manipulation with other therapies for patients with subacute or chronic neck pain showed an improvement on a 100-mm visual analogue scale of pain at 3 weeks of 12.6 mm (93% confidence interval, -0.15, 25.5) for manipulation compared with muscle relaxants or usual medical care. The highest quality randomized controlled trial demonstrated that spinal manipulation provided short-term relief for patients with tension-type headache. The complication rate for cervical spine manipulation is estimated to be between 5 and 10 per 10 million manipulations.

1996 - Chiropractic Treatment of Chronic 'Whiplash' Injuries

http://www.ncbi.nlm.nih.gov/pubmed/9039361

Injury 1996 (Nov); 27 (9): 643–645

Twenty-six (93 per cent) patients improved following chiropractic treatment (U = 34, P < 0.001). The encouraging results from this retrospective study merit the instigation of a prospective randomized controlled trial to compare conventional with chiropractic treatment in chronic 'whiplash' injury.

1996 - Chronic Cervical Zygapophysial Joint Pain After Whiplash: A Placebo-Controlled Prevalence Study

SPINE 1996 (Aug 1); 21 (15): 1737-1744

http://www.ncbi.nlm.nih.gov/pubmed/8855458

The prevalence of cervical zygapophysial joint pain after whiplash has been studied by means of comparative local anesthetic blocks. The concern is that such blocks may be compromised by placebo responses and that prevalence estimates based on such blocks may exaggerate the importance of this condition. In this study, sixtyeight consecutive patients referred for chronic neck pain after whiplash were studied. Those who did not experience pain relief together with the patients with dominant neck pain proceeded to undergo placebo-controlled local anesthetic blocks. Two different local anesthetics and a placebo injection of normal saline were administered in random order and under double-blindfolded conditions. A positive diagnosis was made if the patient's pain was completely and reproducibly relieved by each local anesthetic but not by the placebo injection. Overall, the prevalence of cervical zygapophysial joint pain (C2-C3 or below) was 60% (93% confidence interval, 46%, 73%).

1995 - A risk assessment of cervical manipulation vs. NSAIDs for the treatment of neck pain.

Dabbs V, Lauretti WJ

J Manipulative Physiol Ther 1995 Oct; 18(8): 530-6

OBJECTIVE: We reviewed the literature to evaluate the risk of serious injury or death resulting from cervical manipulation and to assess the evidence that cervical manipulation is an effective treatment for mechanical neck pain. We also reviewed the literature to assess the risks and effectiveness of nonsteroidal antiinflammatory drugs (NSAIDs), which are often used as the "conventional" first-line treatment for similar musculoskeletal conditions.

DATA SOURCES: A series of Medicine literature searches were performed, and materials were reviewed from 1966-1994. Key words included: Chiropractic or Orthopedic Manipulation; Non-Steroidal Anti-Inflammatory Agents; Neck or Back Pain; Randomized Controlled Trials; Adverse Effects.

STUDY SELECTION: Studies and literature reviews that provided a numerical estimate of the risk of serious adverse effects or death from cervical manipulation or NSAID use were selected. Also, randomized, controlled studies that evaluated the effectiveness of manipulation or NSAID use for neck pain were included.

DATA SYNTHESIS: Although there are a small number of well-performed trials of cervical manipulation for neck pain, we were unable to locate even a single randomized, controlled trial examining NSAID use specifically for neck pain. As for

comparative safety, the best available evidence indicates that NSAID use poses a significantly greater risk of serious complications and death than the use of cervical manipulation for comparable conditions.

CONCLUSION: The best evidence indicates that cervical manipulation for neck pain is much safer than the use of NSAIDs, by as much as a factor of several hundred times. There is no evidence that indicates NSAID use is any more effective than cervical manipulation for neck pain.

1995 - Misuse of the literature by medical authors in discussing spinal manipulative therapy injury.

Terrett AG.

School of Chiropractic and Osteopathy, Faculty of Biomedical and Health Sciences, RMIT University, Bundoora, Australia.

J Manipulative Physiol Ther 1995 May;18(4):203-10

OBJECTIVE: This study was conducted to determine how the words chiropractic and chiropractor have been used in publications in relation to the reporting of complications from cervical spinal manipulation therapy (SMT).

STUDY DESIGN: The study method was to collect recent publications relating to spinal manipulation iatrogenesis which mentioned the words chiropractic and/or chiropractor and then determine the actual professional training of the practitioner involved.

METHOD: The training of the practitioner in each report was determined by one of three means: surveying previous publications, surveying subsequent publications and/or by writing to the author(s) of ten recent publications which had used the words chiropractic and/or chiropractor.

RESULTS: This study reveals that the words chiropractic and chiropractor commonly appear in the literature to describe SMT, or practitioner of SMT, in association with iatrogenic complications, regardless of the presence or absence of professional training of the practitioner involved.

CONCLUSION: The words chiropractic and chiropractor have been incorrectly used in numerous publications dealing with SMT injury by medical authors, respected medical journals and medical organizations. In many cases, this is not accidental; the authors had access to original reports that identified the practitioner involved as a nonchiropractor. The true incidence of such reporting cannot be determined. Such reporting adversely affects the reader's opinion of chiropractic and chiropractors.

1995 - A Risk Assessment of Cervical Manipulation vs. NSAIDs for the Treatment of Neck Pain

J Manipulative Physiol Ther 1995 (Oct);18 (8):530–536 http://www.ncbi.nlm.nih.gov/pubmed/8583176

As for comparative safety, the best available evidence indicates that NSAID use poses a significantly greater risk of serious complications and death than the use of cervical manipulation for comparable conditions. In conclusion, the best evidence indicates that cervical manipulation for neck pain is much safer than the use of NSAIDs, by as much as a factor of several hundred times. There is no evidence that indicates NSAID use is any more effective than cervical manipulation for neck pain.

1995 - A Risk Assessment of Cervical Manipulation vs. NSAIDs for the Treatment of Neck Pain

J Manipulative Physiol Ther 1995 (Oct); 18 (8): 530–536 http://www.ncbi.nlm.nih.gov/pubmed/8583176

As for comparative safety, the best available evidence indicates that NSAID use poses a significantly greater risk of serious complications and death than the use of cervical manipulation for comparable conditions. In conclusion, the best evidence indicates that cervical manipulation for neck pain is much safer than the use of NSAIDs, by as much as a factor of several hundred times. There is no evidence that indicates NSAID use is any more effective than cervical manipulation for neck pain.

1993 - Chiropractic Management of a Hypertensive Patient

J Manipulative Physiol Ther 1993 (Oct); 16 (8): 544–549 http://www.ncbi.nlm.nih.gov/pubmed/8263434

Specific contact short lever arm spinal adjustments may cause a hypotensive effect in a medicated hypertensive patient that may lead to complications (e.g., hypotension). Since a medicated hypertensive patient's blood pressure may fall below normal while he or she is undergoing chiropractic care, it is advised that the blood pressure be closely monitored and medications adjusted, if necessary, by the patient's medical physician.

1991 - Effects of Cervical Adjustments on Lateral Flexion Passive Endrange Asymmetry and on Blood Pressure, Heart Rate and Plasma Catecholamine Levels

J Manipulative Physiol Ther 1991 (Oct); 14 (8): 450–456 http://www.ncbi.nlm.nih.gov/pubmed/1940682

Posttreatment goniometric measurements revealed that in sham-adjusted controls, mean lateral-flexion asymmetries had not changed significantly during the 4-hr time period examined. However, in subjects who received lower cervical adjustments, dramatic ameliorations of asymmetry magnitude were observed which persisted throughout the entire 4-hr posttreatment time period. On the other hand, in the face of this rather robust biomechanical effect, heart rate and blood pressure measurements obtained at -60 and -15 min prior to treatments, and at 5, 30, 60, 120 and 240 min following treatments, revealed no significant differences between adjusted and sham-adjusted subjects at any of the time periods examined.

1990 - Time Course Considerations for the Effect of Lower Cervical Adjustments with Respect to the Amelioration of Cervical Lateral Flexion Passive End-range Asymmetries, and on Blood Pressure, Heart Rate, and Plasma Catecholamine Levels

J Manipulative Physiol Ther. 1990 (Jul); 13 (6): 297–304 http://www.ncbi.nlm.nih.gov/pubmed/2394946

Additionally, based on simultaneous serial monitoring of heart rate, blood pressure, and plasma catecholamine concentrations, it does not appear that the therapeutic procedure used in these studies is particularily stressful or traumatic, at least in otherwise asymptomatic subjects.

1990 - An Open Study Comparing Manual Therapy With the Use of Cold Packs in the Treatment of Post-traumatic Headache

Cephalalgia 1990 Oct; 10(5): 241-50

http://www.ncbi.nlm.nih.gov/pubmed/2272094

It is concluded that the type of manual therapy used in this study seems to have a specific effect in reducing post-traumatic headache. The result supports the hypothesis of a cervical mechanism causing post-traumatic headache and suggests that post-traumatic dizziness, visual disturbances and ear symptoms could be part of a cervical syndrome.

1988 - Effects of Chiropractic Treatment on Blood Pressure and Anxiety:A Randomized, Controlled Trial

J Manipulative Physiol Ther 1988 (Dec); 11 (6): 484–488 http://www.ncbi.nlm.nih.gov/pubmed/3075649?dopt=Abstract

Results indicated that systolic and diastolic blood pressure decreased significantly in the active treatment condition, whereas no significant changes occurred in the placebo and control conditions. State anxiety significantly decreased in the active and control conditions. Results provide support for the hypothesis that blood pressure is reduced following chiropractic treatment. Further study is needed to examine the long-term effects of chiropractic treatment on blood pressure.

1988 - Preliminary Study of Blood Pressure Changes in Normotensive Subjects Undergoing Chiropractic Care

J Manipulative Physiol Ther 1988 (Aug); 11 (4): 261–266 http://www.ncbi.nlm.nih.gov/pubmed/3171413?dopt=Abstract

The purpose of this study was to evaluate the reliability of clinical blood pressure readings and to begin a series of experiments to determine if chiropractic adjustments cause any significant changes in blood pressure. Seventy-five students undergoing routine chiropractic health care at Palmer College of Chiropractic Clinic volunteered to participate in the blood pressure measurement protocol in one 10-min visit. Blood pressure was recorded by right arm cuff sphygmomanometer by an experienced chiropractor immediately before and again immediately after either the specific cervical adjustment or the control procedure, which was simply motion palpation. The doctors measuring blood pressures did not know to which group the subject had been assigned. Both systolic and diastolic blood pressures were statistically significantly lowered in the Experimental but not the Control group (p less than 0.01). The difference in the mean blood pressures was small and was brought about by 14 of the Experimental subjects who experienced a clinically relevant 10-20 mm hg drop. Reliability of blood pressure measurements by two doctors was established under similar conditions in an additional 25 subjects.

1986 - The Management of Hypertensive Disease: A Review of Spinal Manipulation and the Efficacy of Conservative Therapeusis *J Manipulative Physiol Ther 1986 (Mar); 9 (1): 27–32* <u>http://www.ncbi.nlm.nih.gov/pubmed/3517211?dopt=Abstract</u> When considering the ailments that plague mankind, certainly one of the enigmatic conditions is hypertensive disease. This perplexing disorder is recognized insidiously in the clinical setting. It is believed to occur because of the complex interactions of a variety of factors which act on the components of the blood vasculature. Although afflicted individuals may appear relatively asymptomatic, the additive influences of such factors eventually culminate in deleterious sequelae. Overall, hypertension appears to be related to stress, diet and lifestyle. The autonomic nervous system, particularly its sympathetic component, appears to mediate such accumulated factors, affecting the overall clinical scenario of hypertension. Although generally aligned with the aging process, this condition also may affect younger individuals. Hypertension, therefore, may be regarded as a prime condition warranting specialized care that includes proper education during the formative years, modification of dietary habits in conjunction with daily exercise regimens, and regular spinal maintenance, all of which are covered by modern chiropractic clinical practice.

Patient Satisfaction (pre 2000)

1997 - The Chiropractic Outcome Study: Pain, Functional Ability and Satisfaction With Care

J Manipulative Physiol Ther 1997 (May); 20 (4):235–240 http://www.ncbi.nlm.nih.gov/pubmed/9168407

Based on these results, it seems that patients suffering from back and/or neck complaints experience chiropractic care as an effective means of resolving or ameliorating pain and functional impairments, thus reinforcing previous results showing the benefits of chiropractic treatment for back and neck pain.

1995 - Studies on Chiropractic: Patient Satisfaction

http://www.bcchiro.com/bcca/publications-and-resources/studies/patientsatisfaction.html

In today's consumer driven health care environment, patient satisfaction is an important health outcome measure. There have been several surveys conducted in recent years assessing patient satisfaction with chiropractic care, which was found to be extremely high. In addition, these surveys invariably found that the level of satisfaction was significantly higher for care received from chiropractors in comparison to the medical profession. Surveys have also indicated that chiropractic patients are willing to return for chiropractic treatment for a similar condition and would recommend chiropractic treatment to friends, family and colleagues.

1995 - The Outcomes and Costs of Care for Acute Low Back Pain Among Patients Seen by Primary Care Practitioners, Chiropractors, and Orthopedic Surgeons

N Engl J Med 1995 (Oct 5); 333 (14): 913–917 http://www.ncbi.nlm.nih.gov/pubmed/7666878

The status at six months was ascertained for 1555 of the 1633 patients enrolled in the study (95 percent). The times to functional recovery, return to work, and complete recovery from low back pain were similar among patients seen by all six groups of practitioners, but there were marked differences in the use of health care services. The mean total estimated outpatient charges were highest for the patients seen by orthopedic surgeons and chiropractors and were lowest for the patients seen by HMO and primary care providers. Satisfaction was greatest among the patients who went to the chiropractors.

1994 - Harris Poll

Patient Evaluations of Care from Family Physicians and Chiropractors Findings from this study indicate that patients under chiropractic care had 3 times the satisfaction rate as did patients under the care of Family Physicians. In addition, the patient's perception of the doctor's confidence in diagnosing and treating low back pain was almost 3 times higher in patients receiving chiropractic care compared with those receiving care from family physicians.

1994 - Patient Satisfaction With Chiropractic Care in Los Angeles AHSR FHSR Annu Meet Abstr Book 1994; 11: 11

http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102211961.html

This RAND Corporation Study found For overall care, 92% of the patients choose the care as either excellent or the best. Although the ratings on all the items are high the highest ratings were given to the more personal qualities of the practitioner: courtesy, politeness, and respect shown to the patient (92%); interest shown in the patient as a person (91%); willingness to listen (89%); ability to put the patient at ease (89%). These results support those of previous studies on chiropractic that suggest that the high satisfaction with chiropractic care is a result more of the personal health encounter than the therapeutic outcome. They also suggest that other providers could learn much from the interpersonal art of chiropractors.

1993 - Patient Satisfaction with Chiropractic Care

J Manipulative Physiol Ther 1993 (Jan); 16 (1):25–32 http://www.ncbi.nlm.nih.gov/pubmed/8423419

Patients expressed high levels of satisfaction with their doctors and the care they received. Although women were slightly more satisfied than men, other patient characteristics such as level of education, income, employment status or previous chiropractic care did not influence response means.

1989 - Patient Evaluations of Low Back Pain Care from Family Physicians and Chiropractors

West J Med 1989 (Mar); 150 (3): 351–355 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1026476/pdf/westjmed00127-0095.pdf

Patients of chiropractors were three times as likely as patients of family physicians to report that they were very satisfied with the care they received for low back pain (66% versus 22%, respectively). Compared with patients of family physicians, patients of chiropractors were much more likely to have been satisfied with the amount of information they were given, to have perceived that their provider was concerned about them, and to have felt that their provider was comfortable and confident dealing with their problem.

SUMMARY:

i) COST EFFECTIVENESS OF CHIROPRACTIC

1993 - THE EFFECTIVENESS AND COST-EFFECTIVENESS OF CHIROPRACTIC MANAGEMENT OF LOW BACK-PAIN THE MANGA REPORT

P Manga, Ph.D.;et al

Funded by the Ontario Ministry of Health, August, 1993

- As the largest existing analysis of scientific literature on low back pain, the 1993 Ontario Ministry of Health commissioned study drew international attention when it recommended the management of low back pain be moved from medical doctors to chiropractic doctors. This comprehensive study reviewed all the published literature on low back pain and made some astounding suggestions. In a nutshell, it concluded that: chiropractic should be the treatment of choice for low back pain – excluding traditional medical care altogether!
- There is an overwhelming body of evidence indicating that chiropractic management of low-back pain is more cost-effective than medical management
- Many medical therapies are of questionable validity or are clearly inadequate
- There is no clinical or case-control study that demonstrates or even implies that chiropractic spinal manipulation is unsafe in the treatment of low-back pain. Some medical treatments are equally safe, but others are unsafe and generate <u>iatrogenic complications</u> for LBP patients.
- Chiropractic is more cost-effective. There would be highly significant cost savings if more management of LBP was transferred from medical physicians to chiropractors.
- There is good empirical evidence that patients are very satisfied with chiropractic management of LBP and considerably less satisfied with physician management
- Chiropractic services should be fully insured under the Ontario Health
 Insurance Plan
- Chiropractic services should be fully integrated into the health care system. Because of the high incidence and cost of LBP, hospitals, managed health care groups, community health centers, comprehensive health organizations, and health service organizations and long-term care facilities should employ chiropractors on a full-time and/or part-time basis
- A good case could be made for placing chiropractic as the gatekeepers for all musculoskeletal complaints that presented to hospitals.

References: (Links are live)

A Comparison of Health Care Costs for Chiropractic and Medical Patients

J Manipulative Physiol Ther 1993 (Jun); 16 (5):291–299;Stano M; School of Business Administration, Oakland University, Rochester, MI 48039

http://www.ncbi.nlm.nih.gov/pubmed/8345311?dopt=Abstract

Health Maintenance Care in Work-Related Low Back Painand Its Association With Disability Recurrence Journal of Occupational and Environmental Medicine 2011 (Apr); 53 (4): 396-404; http://www.ncbi.nlm.nih.gov/pubmed/21407100 A Hospital-Based Standardized Spine Care Pathway: **Report of a Multidisciplinary, Evidence-Based Process** J Manipulative Physiol Ther 2011 (Feb); 34 (2): 98–106 http://www.ncbi.nlm.nih.gov/pubmed/21334541 Cost-effectiveness of Guideline-endorsed Treatments for Low Back Pain: A Systematic Review Eur Spine J. 2011 (Jan 13) [Epub ahead of print] http://www.ncbi.nlm.nih.gov/pubmed/21229367 Cost of Care for Common Back Pain Conditions Initiated With Chiropractic Doctor vs Medical Doctor/Doctor of Osteopathy as First Physician: Experience of One Tennessee-Based General Health InsurerJ Manipulative Physiol Ther 2010 (Nov); 33 (9): 640-643 http://www.jmptonline.org/article/S0161-4754%2810%2900216-2/abstract Clinical Utilization and Cost Outcomes from an Integrative Medicine Independent Physician Association: An Additional 3-year Update J Manipulative Physiol Ther 2007 (May); 30 (4): 263-269 http://www.ncbi.nlm.nih.gov/pubmed/175094 Effects of a Managed Chiropractic Benefit on the Use of Specific Diagnostic and Therapeutic Procedures in the Treatment of Low Back and Neck Pain J Manipulative Physiol Ther 2005 (Oct); 28 (8): 564-569 http://www.ncbi.nlm.nih.gov/pubmed/16226623 Cost-effectiveness of Medical and Chiropractic Care for Acute and Chronic Low Back Pain J Manipulative Physiol Ther 2005 (Oct); 28 (8): 555–563 http://www.ncbi.nlm.nih.gov/pubmed/16226622 Cost Effectiveness of Physical Treatments for Back Pain in Primary Care British Medical Journal 2004 (Dec 11); 329 (7479): 1381 http://www.bmj.com/content/329/7479/1381.full Comparative Analysis of Individuals With and Without Chiropractic Coverage: Patient Characteristics, Utilization, and Costs Archives of Internal Medicine 2004 (Oct 11); 164 (18): 1985-1892 http://archinte.ama-assn.org/cgi/content/full/164/18/1985 An Evaluation of Medical and Chiropractic Provider Utilization and Costs: Treating Injured Workers in **North Carolina** J Manipulative Physiol Ther 2004 (Sep); 27 (7): 442–448 http://www.ncbi.nlm.nih.gov/pubmed/15389175 Chiropractic Care: Is It Substitution Care or Add-on Care in Corporate Medical Plans? J Occup Environ Med 2004 (Aug); 46 (8): 847-855 http://www.ncbi.nlm.nih.gov/pubmed/15300137 **Clinical and Cost Outcomes of an Integrative Medicine IPA** J Manipulative Physiol Ther 2004 (Jun) ; 27 (5): 336-347 http://www.ncbi.nlm.nih.gov/pubmed/1519504 A Practice-Based Study of Patients With Acute and Chronic Low Back Pain Attending Primary Care and Chiropractic Physicians: Two-Week to 48-Month Follow-up J Manipulative Physiol Ther 2004 (Mar); 27 (3): 160–169 http://www.ncbi.nlm.nih.gov/pubmed/15129198 Cost Effectiveness of Physiotherapy, Manual Therapy, and General Practitioner Care for Neck Pain: **Economic Evaluation Alongside a Randomised Controlled Trial** British Medical Journal 2003 (Apr 26); 326 (7395): 911 http://www.bmj.com/content/326/7395/911.full Chiropractic Treatment of Workers' Compensation Claimants in the State of Texas MGT of America, Austin, Texas ~ February 2003 http://www.dynamicchiropractic.com/mpacms/dc/article.php?id=9212 Manual Therapy, Physical Therapy, or Continued Care by a General Practitioner for Patients with Neck Pain. A Randomized, Controlled Trial Ann Intern Med 2002 (May 21); 136 (10): 713-722 http://www.ncbi.nlm.nih.gov/pubmed/12020139 Patient Satisfaction With the Chiropractic Clinical Encounter Abstract #19986 Patient satisfaction with the chiropractic clinical encounter Karen T. Boulanger, BA, Cheryl Hawk, DC, PhD, and Cynthia R. Long, PhD. Palmer Center for Chiropractic Research, 741 Brady Street, Davenport, IA 52803, 319-884-5160, Boulanger_k@palmer.edu http://apha.confex.com/apha/129am/techprogram/paper_19986.htm Testimony to the Department of Veterans Affairs' Chiropractic Advisory Committee George B. McClelland, D.C., Foundation for Chiropractic Education and Research ~ March 25, 2003 http://www.chiro.org/LINKS/ABSTRACTS/Testimony to the Department of Veterans Affairs.shtml

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SUMMARY:

ii) SAFETY OF CHIROPRACTIC

• Cervical Spine Adjusting

No one pays closer attention to injury statistics than Malpractice Insurance carriers.

Scott Haldeman, DC, PhD, MD, reviewed malpractice claims records for a 10year period between 1988 and 1997. In reviewing the outcomes following the application of 134.5 million cervical manipulations (commonly referred to as the chiropractic adjustment), the records indicated that there were 23 reported cases of stroke or vertebral artery dissection (VAD).

 The actual incidence of stroke or VAD following cervical manipulation was found to be one per 5.85 million cervical adjustments. That means that the average chiropractor could work for 1430 years (or practice 48 full chiropractic careers!) before they might be involved with this type of litigation.

Low Back Adjusting

Lower back injury alleged to have occurred following spinal manipulative therapy has been reported in patients with pre-existing disc herniation or prolapse. Of the 30 cauda equina complications associated with manipulation reported in the French, German and English literature over an 80 year period, only 8 were allegedly related to chiropractic treatment.

References (Links are live)

Unconventional Medicine in the United States: Prevalence, Costs, and Patterns of Use New England Journal of Medicine 1993 (Jan 28); 328 (4): 246-252 http://www.chiro.org/alt_med_abstracts/ABSTRACTS/Unconventional_Medicine.shtml Incidence of Adverse Events and Negligence in Hospitalized Patients Results of the Harvard Medical Practice Study I New England Journal of Medicine 1991 (Feb 7); 324 (6): 370-376 Iatrogenic Injury http://www.chiro.org/LINKS/Iatrogenic_Page.shtml **Death by Medicine** Life Extension Foundation http://www.chiro.org/LINKS/FULL/Death_By_Medicine.html A Study to Examine the Effectiveness and Cost-Effectiveness of Chiropractic **Management of Low-Back Pain** Ministry of Health, Government of Ontario Canada 1993 http://www.chiro.org/LINKS/GUIDELINES/Manga_93.shtml The Adequacy of Medical School Education in Musculoskeletal Medicine Journal of Bone and Joint Surgery 1998 (Oct); 80-A (10): 1421-1427 http://www.chiro.org/ChiroZine/ABSTRACTS/Adequacy.shtml **Educational Deficiencies in Musculoskeletal Medicine** Journal of Bone and Joint Surgery 2002 (Apr); 84–A (4): 604–608 http://www.chiro.org/ChiroZine/ABSTRACTS/Educational_Deficiencies.shtml A Comparison of Chiropractic Student Knowledge Versus Medical Residents Proceedings of the World Federation of Chiropractic Congress 2001 Pgs. 255 http://www.chiro.org/ChiroZine/ABSTRACTS/A_Comparison_of_Chiropractic_Student_Knowledge.shtml Arterial Dissections Following Cervical Manipulation: The Chiropractic Experience Canadian Medical Association Journal 2001 (Oct 2); 165 (7): 905-906 http://www.cmaj.ca/cgi/content/full/165/7/905 Misuse of the Literature by Medical Authors in Discussing Spinal Manipulative Therapy Injury J Manipulative Physiol Ther 1995 (May); 18 (4): 203–210 http://www.chiro.org/LINKS/ABSTRACTS/Misuse_of_literature.shtml

Inappropriate Use of the Title Chiropractor and Term Chiropractic Manipulation in the Peer-reviewed **Biomedical Literature** J Manipulative Physiol Ther 1995 (May); 18 (4): 203-210 http://www.chiro.org/ChiroZine/ABSTRACTS/Inappropriate Use of the title.shtml Are German Orthopedic Surgeons Killing People With Chiropractic? ChiroZine ~ 3-26-2005 ~ Editorial Commentary http://www.chiro.org/Professional Regulation/ Guidelines on Basic Training and Safety in Chiropractic World Health Orgainization ~ November 2005 http://www.chiro.org/LINKS/FULL/Basic_Training_and_Safety_in_Chiropractic.pdf Guidelines for Chiropractic Quality Assurance and Practice Parameters Preceedings of the Mercy Center **Consensus** Conference; Page 171 Aspen Publications 1993 Recent Considerations in Nonsteroidal Anti-inflammatory Drug Gastropathy American Journal of Medicine 1998 (Jul 27); 105 (1B): 31S-38S http://www.chiro.org/LINKS/ABSTRACTS/Recent_Considerations.shtml 36 Percent of Acute Liver Failures Are Linked to Acetaminophen U.S. News & World Report July 2, 2001 http://www.chiro.org/LINKS/ABSTRACTS/Liver_Failures_Are_Linked_to_Acetaminophen.shtml Testimony to the Department of Veterans Affairs' Chiropractic Advisory Committee George B. McClelland, D.C., Foundation for Chiropractic Education and Research March 25, 2003 http://www.chiro.org/LINKS/ABSTRACTS/Testimony_to_the_Department_of_Veterans_Affairs.shtml **Incidence of Adverse Drug Reactions in Hospitalized Patients** JAMA 1998 (Apr 15); 279 (15): 1200-1205 http://jama.ama-assn.org/content/279/15/1200.full Failed Back Surgery Syndrome: Diagnostic Evaluation Journal of the American Academy of Orthopaedic Surgeons 2006 (Sep); 14 (9): 534-543 http://tinyurl.com/24nn6m The Spine as Profit Center New York Times December 30, 2006 http://tinyurl.com/y9qohn A Risk Assessment of Cervical Manipulation vs. NSAIDs for the Treatment of Neck Pain J Manipulative Physiol Ther 1995 (Oct); 18 (8): 530–536 http://www.chiro.org/LINKS/ABSTRACTS/Risk_Assessment_of_Cervical_Manipulation.shtml

SUMMARY:

iii) Patient Satisfaction with Chiropractic

- There have been several surveys conducted in recent years assessing patient satisfaction with chiropractic care, which was found to be extremely high.
- These surveys invariably found that the level of satisfaction was significantly higher for care received from chiropractors in comparison to the medical profession.
- Surveys have also indicated that chiropractic patients are willing to return for chiropractic treatment for a similar condition and would recommend chiropractic treatment to friends, family and colleagues.
- The Consumer Reports Health Ratings Center recently surveyed more than 14,000 subscribers who had lower-back pain in the past year but had never had back surgery.
- The percent of people highly (completely or very) satisfied with their backpain treatments and advice varied by practitioner visited.

Professional	Highly satisfied
Chiropractor	59%
Physical therapist	55
Acupuncturist	53
Physician, specialist	44
Physician, primary care	34

Differences in Ratings for physical therapists and acupuncturists were not statistically significant.

Patient Satisfaction With Chiropractic Care in Los Angeles

This RAND Corporation Study found: For overall care, 92% of the patients choose the care of chiropractic as either excellent or the best. Although the ratings on all the items are high the highest ratings were given to the more personal qualities of the practitioner: courtesy, politeness, and respect shown to the patient (92%); interest shown in the patient as a person (91%); willingness to listen (89%); ability to put the patient at ease (89%). These results support those of previous studies on chiropractic that suggest that the high satisfaction with chiropractic care is a result more of the personal health encounter than the therapeutic outcome. They also suggest that other providers could learn much from the interpersonal art of chiropractors. http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102211961.html

References:

Studies on Chiropractic: Patient Satisfaction (Links are live)

Cherkin, D.C., MacCornack, F.A. (1989) "Patient Evaluation of Low Back Pain Care from Family Physicians and Chiropractors", Western Journal of Medicine, Vol.150(3), pp. 351-355.., Garrett, J., Jackman, A., Mclaughlin, C., Fryer, J., Smucker, D.R. (1995) "The Outcomes and Costs of Care for Acute Low Back Pain Among Patients Seen By

Primary Care Practitioners, Chiropractors, and Orthopedic Surgeons", New England Journal of Medicine, Vol. 333, pp. 913-917.

Shekelle, P.G., Markovich, M., Louie, R. (1995) "Factors Associated with Choosing a Chiropractor for Episodes of Back Pain Care", Medical Care, Vol. 33, pp. 842-850.

http://www.ncbi.nlm.nih.gov/pubmed/8423419

http://www.ncbi.nlm.nih.gov/pubmed/9168407

http://www.chiro.org/ChiroZine/ABSTRACTS/Patient_Satisfaction_With_Chiropractic.shtml

http://www.ncbi.nlm.nih.gov/pubmed/11753328

http://www.ncbi.nlm.nih.gov/pubmed/7666878

http://www.ncbi.nlm.nih.gov/pubmed/8184314

SUMMARY:

iv) Effectiveness of Chiropractic

- Spinal manipulation/mobilization is effective in adults for: acute, subacute, and chronic low back pain; migraine and cervicogenic headache; cervicogenic dizziness; manipulation/mobilization is effective for several extremity joint conditions; and thoracic manipulation/mobilization is effective for acute/subacute neck pain
- Spinal manipulation is used to reduce pain and improve function in patients with both chronic low-back pain and acute and sub-acute low-back pain.
- Patients undergoing spinal manipulative treatment for low-back pain often experience improvement in function, in addition to a reduction in their pain levels.
- When used in conjunction with spinal manipulation, exercise is likely to improve the patients' symptoms, increase the speed of recovery, and reduce the recurrence of pain.
- Chiropractic Treatment of Workers' Compensation Claimants in the State of Texas

MGT of America, Austin, Texas http://www.dynamicchiropractic.com/mpacms/dc/article.php?id=9212

- Of the nearly 900,000 workers' compensation claims received from 1996 to 2001, only 14.6 percent of claimants were treated by doctors of chiropractic, and only 8.5 percent of those workers received more than half of their treatment from chiropractors.
- Chiropractic care accounted for only 12.5 percent of medical fees and 6.9 percent of the total workers' compensation costs. However, the firm noted that these figures did not include the costs of pharmaceuticals, because insurers are not required to provide such information to the Texas Workers' Compensation Commission (TWCC). If those costs were included, the percentage of costs related to chiropractic care would have been even lower.
- Lower back and neck injuries accounted for 38 percent of all claims costs. Chiropractors treated about 30 percent of workers with lower back injuries, but were responsible for only 17.5 percent of the medical costs and 9.1 percent of the total costs.
- The average claim for a worker with a low-back injury was \$15,884. However, if a worker received at least 75 percent of his or her care from a chiropractor, the total cost per claimant decreased by nearly one-fourth to \$12,202. If the chiropractor provided at least 90 percent of the care, the average cost declined by more than 50 percent, to \$7,632.
2013 - Adding Chiropractic Manipulative Therapy to Standard Medical Care for Patients With Acute Low Back Pain: Results of a Pragmatic Randomized Comparative Effectiveness Study

Spine: 15 April 2013 - Volume 38 - Issue 8 - p 627–634doi:

10.1097/BRS.0b013e31827733e7

Randomized Trial

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Abstract

Study Design. Randomized controlled trial.

Objective. To assess changes in pain levels and physical functioning in response to standard medical care (SMC) versus SMC plus chiropractic manipulative therapy (CMT) for the treatment of low back pain (LBP) among 18 to 35-year-old active-duty military personnel.

Summary of Background Data. LBP is common, costly, and a significant cause of long-term sick leave and work loss. Many different interventions are available, but there exists no consensus on the best approach. One intervention often used is manipulative therapy. Current evidence from randomized controlled trials demonstrates that manipulative therapy may be as effective as other conservative treatments of LBP, but its appropriate role in the healthcare delivery system has not been established.

Methods. Prospective, 2-arm randomized controlled trial pilot study comparing SMC plus CMT with only SMC. The primary outcome measures were changes in back-related pain on the numerical rating scale and physical functioning at 4 weeks on the Roland-Morris Disability Questionnaire and back pain functional scale (BPFS). Results. Mean Roland-Morris Disability Questionnaire scores decreased in both groups during the course of the study, but adjusted mean scores were significantly better in the SMC plus CMT group than in the SMC group at both week 2 (P < 0.001) and week 4 (P = 0.004). Mean numerical rating scale pain scores were also significantly better in the group that received CMT. Adjusted mean back pain functional scale scores were significantly higher (improved) in the SMC plus CMT group than in the SMC plus CMT group than in the SMC plus CMT of this trial suggest that CMT in conjunction with SMC offers a significant advantage for decreasing pain and improving physical functioning when compared with only standard care, for men and women between 18 and 35 years of age with acute LBP.

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Summary:

v) Medical education - deficiencies in musculoskeletal medicine

- 82% of the eighty-five medical school graduates failed this BASIC competency exam.
- Four years later they redesigned the exam and again gave it to all the residents. Even though the passing grade was LOWERED from 74% to 70%, 78% of them again failed the exam, with a mean test score average of 59.9 percent.
- The exact same test was given to a group of 51 chiropractic students during their last semester of schooling. The results? 70% of the students passed the test. This is in contrast to an 80% failure rate for the MDs.
- The chiropractic group were still JUST STUDENTS in their last undergrad year
- The medical group had already graduated medical school, been awarded their MD degrees, completed all their hospital rotations, and finally been accepted into highly competitive orthopedic residencies.
- A survey of family practice physicians found 51 percent of respondents felt that they had insufficient training in orthopaedics. Furthermore, 56 percent of those surveyed claimed that medical school was their only source for formal musculoskeletal training (MSK).
- In another study, pediatric residents said they had the least adequate training in orthopaedics. Graduating family practice residents felt significantly more confident in performing physical exams, evaluating radiographs, and diagnosing and treating non-MSK disorders than they did for MSK conditions.
- Seventy (82 per cent) of eighty-five medical school graduates from thirtyseven different schools failed to demonstrate such competency on a validated examination of fundamental concepts.

SUMMARY:

vi) WORKERS COMPENSATION STUDIES: (links are live)

Cost Comparisons of Chiropractic Care Versus other Health Care Provider: TEXAS WORKERS' COMPENSATION REPORT:

Chiropractic Treatment of Workers' Compensation Claimants in the State of Texas MANGA II:

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 Utilization, Cost, and Effects of Chiropractic Care on Medicare Program Costs Muse and Associates. American Chiropractic Association 2001 FLORIDA WORKERS' COMPENSATION REPORT: Trends in Chiropractic Treatment of Workers' Compensation in the State of Florida (Tallahassee, Florida: 2002) MGT of America, Inc. State Specific Workers Compensation Studies: Chiropractic Treatment of Workers' Compensation Claimants in the State of Texas Executive Summary. MGT of America Feb 2003. Chiropractic care of Florida workers' compensation claimants: Access, costs, and administrative outcome trends from 1994 to 1999, Topics in Clinical Chiropractic 2002; 9(4): 33-53 Managed Care Pre-approval and its Effect on the Cost of Utah Worker Compensation Claims J Manipulative Physiol Ther. 1997 (Jul); 20 (6): 372-6 Preliminary Findings of Analysis of Chiropractic Utilization in the Workers' Compensation System of New South Wales, Australia J Manipulative Physiol Ther, 1995 (Oct); 18 (8); 503-11 A non-surgical approach to the management of lumbar spinal stenosis: a prospective observational cohort study BMC Musculoskelet Disord. 2006 (Feb 23); 7: 16 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); 6 (2): 131-7 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); 30 (3): 215-227 A nonsurgical approach to the management of patients with cervical radiculopathy J Manipulative Physiol Ther. 2006 (May); 29 (4): 279-87 Efficacy Of Treating Low Back Pain And Dysfunction Secondary To Osteoarthritis: Chiropractic Care **Compared With Moist Heat Alone** J Manipulative Physiol Ther. 2006 (Feb); 29 (2): 107-14 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 Factors Associated With Patient Satisfaction With Chiropractic Care: Survey and Review of the Literature J Manipulative Physiol Ther 2006 (Jul); 29 (6): 455-462 A pilot study comparing two manual therapy interventions for carpal tunnel syndrome J Manipulative Physiol Ther. 2007 (Jan); 30 (1): 50-61 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 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); 6 (3): 289-95 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): 288–296 Chiropractic care for nonmusculoskeletal conditions: a systematic review with implications for whole systems research J Altern Complement Med. 2007 (Jun); 13 (5): 491-512 **Chiropractic Services in the Canadian Armed Forces: A Pilot Project** Military Medicine 2006 (Jun); 171 (6): 572-576 A population-based survey of back pain beliefs in Canada Spine. 2006 (Aug 15); 31 (18): 2142-5

Efficacy of Spinal Manipulation and Mobilization for Low Back Pain and Neck Pain: A Systematic Review and Best Evidence Synthesis Spine Journal 2004 (May); 4 (3): 335-356 Efficacy of Preventive Spinal Manipulation for Chronic Low-Back Pain and Related Disabilities: A **Preliminary Study** J Manipulative Physiol Ther 2004 (Oct); 27 (8): 509-514 Factors Related to the Inability of Individuals With Low Back Pain to Improve With a Spinal **Manipulation** Physiological Therapeutics 2004 (Feb); 84 (2): 173-190 A Randomized Clinical Trial Comparing Chiropractic Adjustments to Muscle Relaxants for Subacute Low **Back Pain** J Manipulative Physiol Ther 2004 (Jul); 27 (6): 388-398 Manual Therapy and Exercise Therapy in Patients With Chronic Low Back Pain: A Randomized, **Controlled Trial With 1-Year Follow-Up** SPINE (Phila Pa 1976) 2003 (Mar 15); 28 (6): 525-531 A Randomized Trial of Combined Manipulation, Stabilizing Exercises, and Physician Consultation Compared to Physician Consultations Alone for Chronic Low Back Pain Spine (Phila Pa 1976). 2003 (Oct 1); 28 (19): 2185-91 Chronic Spinal Pain: A Randomized Clinical Trial Comparing Medication, Acupuncture, and Spinal Manipulation Spine (Phila Pa 1976) 2003 (Jul 15); 28 (14): 1490-1502 Patterns and Perceptions of Care for Treatment of Back and Neck Pain: Results of a National Survey Spine (Phila Pa 1976) 2003 (Feb 1); 28 (3): 292-297 Comparing the Satisfaction of Low Back Pain Patients Randomized to Receive Medical or Chiropractic Care: Results From the UCLA Low Back Pain Study Am J Public Health 2002 (Oct); 92 (10): 1628-1633 Manual Therapy, Physical Therapy or Continued Care by a General Practitioner for Patients with Neck Pain Annals of Internal Medicine 2002 (May 21); 136 (10): 713-722 Patient Satisfaction with the Chiropractic Clinical Encounter: Report from a Practice-Based Research Program J Neuromusculoskeletal System 2001: 9 (4): 109–117 Patient Satisfaction with Chiropractic Physicians in an Independent Physicians Association J Manipulative Physiol Ther 2001 (Nov); 24 (9): 556-559 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 J Manipulative Physiol Ther 2000 (May); 23 (4): 239-245 Single-blind Randomised Controlled Trial of Chemonucleolysis and Manipulation in the Treatment of Symptomatic Lumbar Disc Herniation European Spine Journal 2000 (Jun); 9 (3): 202–207 Chronic Spinal Pain Syndrome: A Clinical Pilot Trial Comparing Acupuncture, a Non-Steroidal Anti-**Inflammatory Drug and Spinal Manipulation** J Manipulative Physiol Ther 1999 (Jul); 22 (6): 376-381 Comparative Efficacy of Conservative Medical and Chiropractic Treatments for Carpal Tunnel Syndrome: **A Randomized Clinical Trial** J Manipulative Physiol Ther 1998 (Jun); 21 (5): 317-326 The Effect of Spinal Manipulation in the Treatment of Cervicogenic Headache J Manipulative Physiol Ther 1997 (Jun); 20 (5): 326-330 Randomized Comparison of Chiropractic and Hospital Outpatient Management for Low Back Pain: **Results from Extended Follow Up** British Medical Journal 1995 (Aug 5); 311 (7001): 349-351 Spinal Manipulation vs. Amitriptyline for the Treatment of Chronic Tension-Type Headaches: A **Randomized Clinical Trial** J Manipulative Physiol Ther 1995 (Mar): 18 (3): 148–154 The Outcomes and Costs of Care for Acute Low Back Pain Among Patients Seen by Primary Care Practitioners, Chiropractors, and Orthopedic Surgeons New England Journal of Medicine 1995 (Oct 5); 333 (14): 913-917 The Effectiveness and Cost-Effectiveness of Chiropractic Management of Low-Back Pain Richmond Hill, Ontario: Kenilworth Publishing, 1993 **Patient Satisfaction With Chiropractic Care** J Manipulative Physiol Ther 1993 (Jan); 16 (1): 25-32 Low Back Pain of Mechanical Origin: Randomized Comparison of Chiropractic and Hospital Outpatient Treatment British Medical Journal 1990(Jun 2); 300 (6737): 1431-1437 Patient Evaluations of Low Back Pain Care From Family Physicians and Chiropractors Western Journal of Medicine 1989 (Mar); 150 (3): 351-355

<u>Satisfaction With Low Back Pain Care</u> Spine Journal (Official Journal of the North American Spine Society) 2008 (May); 8 (3): 510-521 Treatment of Neck Pain: Noninvasive Interventions: Results of the Bone and Joint Decade 2000-2010: Task Force on Neck Pain and Its Associated Disorders Spine (Phila Pa 1976). 2008 (Feb 15); 33 (4 Suppl): S123-152 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 Annals of Internal Medicine 2007 (Oct 2); 147 (7): 492-504

GENERAL INTEREST – MUST READ ARTICLES

WASHINGTON POST

SPECIAL REPORT

THE COST OF HEALING

How America puts the wrong price on healthcare.

2013 - Spinal fusions serve as case study for debate over when certain surgeries are necessary

By Peter Whoriskey and Dan Keating, Published: October 27, 2013

By some measures, Federico C. Vinas was a star surgeon. He performed three or four surgeries on a typical weekday at the Daytona Beach, Fla., hospital that employed him, and a review showed him to be nearly five times as busy as other neurosurgeons. The hospital paid him hundreds of thousands in incentive pay. In all, he earned as much as \$1.9 million a year.

Yet given his productivity, some hospital auditors wondered: Was all of the surgery really necessary?

To answer that question, the hospital in early 2010 paid for an independent review of cases in which Vinas and two other neurosurgeons had performed a common procedure known as a spinal fusion. The review was conducted by board-certified neurosurgeons working for AllMed, a company accredited to audit health-care businesses.

Of 10 spinal fusions by Vinas that were selected, nine were deemed not medically necessary, according to a summary of the report.

Vinas is still working at Halifax Health, and a hospital spokesman said that, after the AllMed report, the hospital conducted an internal review that validated his surgeries. Another review conducted this year in response to litigation also validated them, the spokesman said. The hospital would not answer further questions or release details of those reviews.



Cost per surgery almost triples





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Vinas "has never and will never perform an unnecessary surgical procedure on any patient," his attorney, Robert H. Pritchard, said in a statement.

More than 465,000 spinal fusions were performed in the United States in 2011, according to government data, and some experts say that a portion of them — perhaps as many as half — were performed without good reason.

The rate of spinal fusion surgery has risen sixfold in the United States over the past 20 years, according to federal figures, and the expensive procedure, which involves the joining of two or more vertebrae, has become even more common than hip replacement.

It can be difficult, in individual cases, to get doctors to agree about when the procedure is warranted.

But at a broader level, the rapid rise of spinal fusions in the United States, especially for diagnoses that generally don't require the procedure, has raised questions from experts about whether, amid medical uncertainty, the financial rewards are spurring the boom.

Advancements in diagnostic and surgical technology may explain some of the increase in surgery. And patients may have become more demanding. But a Washington Post analysis of 125,000 patient records also shows that roughly half the tremendous rise in spinal fusions in Florida has been on patients with diagnoses that experts and professional societies say should not routinely be treated with spinal fusion.

Questions are raised

Normally, information that might shed light on the ways that economics shape medical decisions by doctors and hospitals doesn't become public. But a wideranging lawsuit at Halifax Health offers an unusual glimpse into these issues.

In 2009, a former compliance official at the hospital filed a whistleblower lawsuit alleging illegal financial incentives for doctors. The court filings make available an array of documents — e-mails, testimony, audits. These and other sources allow a fuller depiction of the financial rewards and relationships that depended on treatment decisions. They also show how hospital administrators responded when suspicions arose that a doctor, who was generating millions in profits, may have been performing unnecessary surgery.

The compliance official, Elin Baklid-Kunz, couldn't determine by herself whether any of the surgeries Vinas had performed was unnecessary — she is not a doctor.

But just as the numbers of spinal fusions in the United States have raised questions about the procedure's necessity, audits she and an outside firm had conducted showed unusual productivity in parts of the hospital. Those numbers, she says, demanded further review. Moreover, the compensation agreements the hospital had with Vinas and other doctors essentially offered large incentives for more treatment, she has alleged. The Justice Department has joined her lawsuit regarding illegal compensation.

As at many hospitals, the financial benefits of operating at Halifax Health extended to at least three groups.

•Vinas and his colleagues in neurosurgery earned as much as thousands of dollars extra — above their base salaries — for each procedure after a certain threshold. The vast majority of Vinas's earnings came from such incentive pay, according to legal filings.

According to government estimates, each neurosurgeon at Halifax Health was generating more than \$2 million a year in hospital profits. The hospital charged fusion patients an average of about \$80,000, according to Florida records on Halifax Health analyzed by The Post, ranking the procedure as one of the more expensive.
The companies that sell the hardware — screws and braces — already a multibillion-dollar business in the United States, also benefited. Those companies often have a representative positioned in the operating room, where the equipment for one fusion can typically amount to a \$7,000 sale, according to the Millennium Research Group. Vinas was friendly enough with his parts salesman — who, among other things, measured the length of the necessary screws — that he traveled in Thailand with him, according to a deposition.

Baklid-Kunz detected Vinas's rapid pace of work in an audit and asked for further review of his surgeries, documents show. But she was discouraged from investigating further, she said.

"Hospital administrators didn't want to touch Dr. Vinas," she said in an interview. Instead, they referred to Vinas and the hospital's two other neurosurgeons as "our high rollers," she said, and told her that rather than cracking down on their billing that "we need to make them happy."

More than two years would pass before the hospital pursued the further review Baklid-Kunz had recommended — the AllMed report — and it was during the wait that she decided to file the lawsuit. Even after the AllMed report, she said, the hospital did little to curb Vinas's practices.

"The hospital was caught in the act and did nothing," said Marlan Wilbanks, Baklid-Kunz's attorney. "They didn't send anyone to extra training. They didn't take any extra steps at all. They were making a lot of money."

Hospital spokesman John Guthrie said the AllMed report was "bogus" because it was based on cases that Baklid-Kunz had selected.

"The AllMed report was based on incomplete medical records that were cherrypicked," the hospital said in a statement. "For The Post to accept this unsupported report as fact is irresponsible and creates a grossly misleading perception." Pritchard, Vinas's attorney, said his client is a well-respected surgeon, with almost 100 publications and book chapters to his credit, who takes steps to make sure that surgery is done only as a last resort.

Vinas has never had a malpractice action filed against him and, even though he has seen 15,000 patients in his career, only "a very small handful" expressed dissatisfaction with his care, Pritchard said.

Steven Huntt, 62, a heavy-equipment mechanic, said Vinas operated on him four or five times.

"I'd have one and then another," he said. "I can't explain it, but I had to have them. Dr. Vinas said if I didn't have it, I'd have been paralyzed. Some people said to let it go, but being a mechanic, I like to fix what's broken.

"He's a gentle, kind man," Huntt said. "I don't think he ever did a surgery that was unnecessary."

What is necessary?

As U.S. medical costs have risen, questions about unnecessary treatment have become frequent. By some estimates, Americans are spending billions every year on unnecessary surgery and other medical care.

Medicare, the nation's health-care system for people older than 65, is at the center of the debate.

As the nation's largest insurer, it is critical to determining what kinds of surgeries in the United States are covered — and, therefore, performed. Many private insurers look to Medicare when making their own decisions.

Today, by its own admission, Medicare may be spending billions annually on unnecessary medical treatment.

The Medicare agency every year audits a sample of the claims it has paid and determines how many of those have "medical necessity" errors. The agency estimated the amount of money spent improperly on spinal fusions was more than \$200 million in 2011, for example, and most of that was because the treatment was deemed unnecessary, often because a more conservative course hadn't been tried, officials said.

How could this happen?

The answer, in part, is that the Medicare system is not designed to discourage doctors from performing it, according to past and present Medicare officials.

At a very practical level, the bureaucracy offers little incentive to weed out unnecessary treatment: Medicare hires contractors to issue payments to doctors, and those contractors are paid based not on how many claims they reject but on how many they approve.

"The contractors are incentivized to efficiently process claims and not to accurately evaluate clinical effectiveness" of treatment, according to a paper by three former senior officials at the Medicare agency and one current one. Moreover, when bureaucrats try to restrict what surgeries Medicare will pay for, they sometimes face punishing political backlash.

In 1978, for example, Congress created the National Center for Health Care Technology, which among other things recommended to Medicare what procedures it should cover.

It ran on a \$4 million budget, and within just a few years of its inception, it was estimated that its advice had saved the government between \$100 million and \$200 million a year.

But two influential groups opposed the agency's mission: the American Medical Association and the Health Industry Manufacturers Association.

Medical judgements are "better made — and are being responsibly made — within the medical profession," an AMA spokesman told Congress at the time. "The advantage the individual physician has over any national center or advisory council is that he or she is dealing with individuals in need of medical care, not hypothetical cases."

In 1981, Congress zeroed out the agency's budget.

Again in 1989, Congress decided that there should be a government effort to review the effectiveness of medical treatments.

It was called the Agency for Health Care Policy and Research, and in its first years, it issued guidelines on how to treat hysterectomies, strokes and ulcers. Then, in 1994, the agency published a set of guidelines on back pain, discouraging spinal fusion for some cases.

"For several low back disorders, no advantage has been demonstrated for fusion over surgery without fusion, and complications of fusions are common," its researchers concluded.

The reaction from some surgeons was furious. The North American Spine Society suggested that the effort was a waste of taxpayer money. A letter-writing campaign was launched. A Virginia spine surgeon founded a group called the Center for Patient Advocacy, which sought to kill the agency.

Some physicians rallied to its defense. But when the dust settled in Congress, the agency's budget was cut by 21 percent, and the agency curtailed its efforts at developing guidelines.

"The larger damage was the message sent by Congress: 'If you get too close to actually changing how clinical or reimbursement decisions are made, Congress is going to slap you down,'" said Sean Tunis, formerly chief medical officer at the Medicare agency. "I think everyone took a lesson from that."

A rise in spinal fusions

Even by American health-care standards, the rise of spinal fusions has been remarkable. According to federal figures, the number of spinal fusions in the United States rose from 56,000 in 1994 to 465,000 in 2011.

Advancements in technology — more refined imaging, new spinal devices to hold vertebrae in place — probably account for some of the rise.

Moreover, Americans may be demanding more mobility as they age, surgeons say. "Patients want to be able to play tennis and golf and go surfing at much higher ages than they did in the past," said Gunnar Andersson, chairman emeritus of the department of orthopedic surgery at Rush University Medical Center in Chicago and president-elect of the International Society for the Advancement of Spine Surgery, a professional group. "They are more likely to seek out treatment and more likely to accept surgery as an option."

He added that some of the critics of the procedure, who believe spinal fusions are being performed too frequently, are "not wrong."

"The problem is we don't know what the rate of spinal fusions ought to be," he said. The growth in spinal fusion in the United States has been much faster than other surgeries to address wear and tear, such as knee and hip replacements. And Americans are far more likely to undergo the procedure than people from other countries. The rate of spinal fusions in the United States is about 150 per 100,000 people, according to federal data. In Australia, it is about one-third of that; in Sweden, it is about 40 per 100,000; and in Britain it is lower still.

Or just consider the sales of spinal fusion equipment. Sales of such equipment in the United States amount to \$5.1 billion a year, nearly twice what the total sales are in the rest of the world, according to

The deal with Protrea Hospitality would nearly double Marriott's presence in Africa.

"My hunch is that as many as half of the spine fusions in the U.S. are unnecessary," said Richard Deyo, a researcher at Oregon Health and Science University and a longtime critic of the procedure.

The International Society for the Advancement of Spine Surgery has sounded a note of caution in its policy statement on lumbar fusion, too.

"Increasing success and optimism may be leading some surgeons to overuse procedures beyond what the current state of medical evidence really supports," it says. The varying rates of spine surgery suggest "a lack of collective adherence to the current state of medical evidence."

To get a better understanding of the reasons for the boom, The Post reviewed 125,000 records of patients who underwent spinal fusions in Florida. The data included primary and secondary diagnoses.

The analysis shows that the procedure has been used more and more to treat ailments of the lower back that experts say are generally better addressed with safer and less-costly treatments.

Professional societies and other experts rule out or discourage the routine use of spinal fusion for several common problems of the lower back — stenosis, herniated discs and disc degeneration — when there are no accompanying problems of spinal instability or deformity.

Yet about half of the rise in lumbar spinal fusions has come from its use for just such ailments.

Between 2000 and 2012, the number of lumbar spinal fusions for those ailments in the state rose fivefold, from 2,014 to 9,887, according to the analysis of Florida records.

Lumbar spinal fusions to treat stenosis, an ailment caused by a narrowing of the spinal canal, rose the fastest, from 292 in 2000 to 2,565 in 2012.

Medicare and insurance companies could stop paying for such procedures, of course. When they object, however, their motivations are often viewed as profit-driven as much as scientific.

But decisions about surgery also have financial ramifications for doctors, as Eugene Carragee, a surgeon and professor at Stanford University, has noted.

He said that a simpler procedure known as a decompression often offers patients, without complications, as much benefit as a fusion and poses fewer risks. But the decompression might yield a surgeon roughly \$1,000, while a complex fusion would garner as much as \$6,000.

While insurers see a "conspiracy of escalation," Carragee said, "surgeons are saying, 'You can't tell me what the appropriate thing is to do.'"

Medicare weighs in

In 2006, Medicare decided to take a closer look at spinal fusion surgery. At the time, the number of spinal fusions had been soaring upward, rising by nearly five times over the previous decade.

An increasing number of the spinal fusions were being done to treat something called degenerative disc disease, an affliction that results in pain from a disc that has disintegrated after normal wear and tear.

Medicare officials decided to convene a panel to examine the use of lumbar spinal fusion in patients with degenerative disc disease.

The evidence that a spinal fusion was the best means of treating it was sparse. The researchers that Medicare commissioned to summarize the evidence found only four randomized clinical trials of spinal fusion for degenerative disc disease. Three trials found no clear benefit of spinal fusion over other therapy.

The fourth found just the opposite — that there was a benefit. It was alone in another regard as well. While the others had been funded by governments or nonprofit groups, the positive study was funded by two companies that make spinal surgery equipment — Acromed and Ossano Scandinavia.

The authors of the evidence review, led by Duke University physician and researcher Douglas C. McCrory, reported that there was no conclusive evidence that spinal fusion offers "short-term or long-term benefits compared with non-surgical treatment."

The report was then presented to a Medicare advisory committee of nine voting doctors. Three of them had worked for or owned stock in makers of spinal equipment.

Their votes were cast on a scale of one to five: A one reflected that fusion was "not likely" to benefit patients with lumbar degenerative disc disease, three was "reasonably likely" and five "very likely."

The long-term benefit of spinal fusion was judged a 1.5 - that is, the panel had voted that it was less than "reasonably likely" that spinal fusion provides a benefit.

Yet Medicare never changed its policy: It still pays for spinal fusions for degenerative disc disease.

A Medicare spokeswoman, Kathryn Ceja, offered this statement: "By law, Medicare must cover items and services that are reasonable and necessary. Within those rules, doctors and their patients are free to make medical treatment decisions that are best for the patient."

After the 2006 advisory meeting, the number of spinal fusions continued its rapid upward trend.

An analysis of health records published last year in the journal Spine showed that the number of spinal fusions for degenerative disc disease in the lumbar spine had more than tripled between 1998 and 2008, becoming the most common primary diagnosis for spinal fusions.

Like Medicare, insurers have proved tentative about restricting payment. Some insurers have put modest limits on lumbar fusion procedures, but the idea of an insurance company putting itself between a patient and a doctor's recommendation often spurs unwelcome publicity.

In late 2009, for example, Blue Cross Blue Shield of North Carolina decided to curb its use based on research and the guidelines of professional societies.

In the first year, the number of lumbar spinal fusions at the insurer dropped 32 percent. But the insurer was also confronted with unflattering portrayals in the newspaper and on television. A local TV station ran an investigative story about the insurer denying coverage. "Guys, a major insurance company here in North Carolina is one of the first to deny a back surgery that some doctors love but some insurers don't," an investigative reporter on Raleigh's ABC affiliate announced one night. "Why? At least one doctor and two patients we talked with say it's all about profit margin."

Unhappy patients

Ever since the news of Baklid-Kunz's lawsuit against the hospital, some of Vinas's patients, especially those who say the surgery did nothing — or worse, harmed them — have begun to wonder whether their surgery was necessary.

Among the patients who have come to doubt the surgery they had is a dentist who says he had to sell his practice because after the surgery he could no longer stand for long periods; another is a pipe fitter who can no longer work and became unsteady on his feet; another is a retired aerospace engineer who developed cognitive problems after the surgery.

Three patients said Vinas urged them to get the surgery, too. He warned them that they were going to be "crippled" or "in a wheelchair" if they didn't, they say.

Eunice Murphy was a retiree playing tennis four times a week before the surgery; she says she has had trouble walking since then.

"I wasn't his patient," Murphy said. "I was his victim."

Vinas fused her spine after she complained of numbness in her thumb and forefinger. Vinas's medical report says she had "intractable neck pain," too. Murphy insists the problem was only in her hand. Three months later, she got a second fusion from Vinas for back pain and leg trouble, according to his report. The hand trouble was unaffected by the fusion surgery, she says. This year, she went to another doctor for what she says is the same hand trouble. He traced it in part to carpal tunnel syndrome, an ailment of the wrist, according to that doctor's report.

She bought an \$18 brace for her forearm at the drugstore, and the numbness receded, she says.

More than a year after the second fusion surgery from Vinas, she got an appointment just to confront him, she said. She is not suing him for malpractice — the two-year window for filing such a suit has elapsed.

"I said, 'This is the cruelest thing one person could do to another. Why did you ruin the rest of my life?'"

William Scott, 62, the pipe fitter, had been having back pain for years. He was diagnosed with lumbar stenosis and degenerative problems. He was tired of taking medication for the problem and decided to see if the surgery would help him.

"Vinas told me I'd be back on my motorcycle in time for Bike Week" in a few months, he said.

But instead of curing him, the surgery has all but crippled him, he says. He can't stand for long, can't take walks because he is prone to falling and can no longer work. He had to sell his motorcycle.

"He took my life away," Scott said, his voice rising. "He took being a man and a husband away from me.

And for what?"

Pritchard, Vinas's attorney, said his client was barred by law from commenting on individual patients.

But he noted that despite a surgeon's best efforts, "a small percentage may not recover as well as hoped and may be dissatisfied. That in no way means the surgery was unnecessary or should not have been performed."

Any suggestion that a fusion was performed on a patient with only carpal tunnel syndrome is "patently absurd," he said.

Other opinions

Another employee at Halifax Health who came to question Vinas's practice was a fellow neurosurgeon.

William Kuhn said he would no longer assist in surgeries with Vinas, at least in part because he questioned the type of surgery being done, though he said he did not reach any conclusion, according to his deposition.

"On a couple of cases I've walked into the room to assist, and looking at the films alone and hearing a brief description of the patient's symptoms ... based only on that information, I had felt somewhat uncomfortable regarding the procedure that was being performed," Kuhn said in a deposition.

In 2007, auditors ran the numbers on Vinas — and he was exceptionally busy. A physician's work is measured in terms of RVUs, or relative value units. Each procedure is assigned a certain number of them. By that measure, Vinas was nearly five times as busy as the average U.S. neurosurgeon, working at a rate of more than 25,000 RVUs per year, while the national average for a neurosurgeon was 5,600, according to the audit by an outside company.

The proportion of fusion procedures in his practice was about three times the national average for neurosurgery practices, the numbers showed. He told hospital officials that he was tailoring his practice to patients who required a fusion, but he declined to comment for this story.

After the big numbers in the 2007 audit, the hospital's compliance department proposed a clinical review to determine whether Vinas's surgeries were medically necessary, according to a memo at the time written by Baklid-Kunz.

In early 2010, after more than two years, the hospital hired AllMed and its independent board-certified neurosurgeons to conduct the review.

With guidance from AllMed, Baklid-Kunz, as a hospital compliance official, picked 10 of Vinas's cases between October 2008 and December 2009, as well as the five for Kuhn and five for a third neurosurgeon.

AllMed used several board-certified neurosurgeons to perform the reviews. The reviewers had the complete inpatient records and, except for "a few" cases, imaging done before the surgeries, according to a summary Baklid-Kunz prepared at the time.

Kuhn would fare only marginally better than Vinas when his cases were reviewed by AllMed. Their report found that in three of five cases reviewed the surgeries were not medically necessary. He did not return phone calls seeking comment, and his secretary directed calls to the hospital spokesman.

As for Vinas, the report found that nine of Vinas's 10 fusions were not medically necessary, according to a summary. It called into question Vinas's technique in three cases.

When presented with the results, Vinas was "pretty upset," he said in a deposition, and he prepared a written response. As part of a review, he sat with the hospital's chief medical officer, Don Stoner, who is a cardiovascular specialist, not a neurosurgeon. The hospital declined to offer any more information about this review. "There were not any specific concerns about my practice. And we discussed that there was room to improve my documentation, that not all was perfectly complete," Vinas said in a deposition. "In some cases you have two physicians providing different opinions, and there is more than one way to treat a patient."

About three years later, the hospital decided to take another look at the AllMed report.

By then, the hospital had come under a new level of scrutiny when in late 2011 the Justice Department joined Baklid-Kunz's suit.

The hospital hired Timothy Schoettle of Kentucky, a neurosurgeon, to review the AllMed cases, hospital spokesman Guthrie said. Schoettle found that all of those 10 surgeries were medically necessary, Guthrie said.

The hospital declined to make available a copy of Schoettle's report affirming Vinas, however, and Schoettle did not return phone calls to his office. The hospital did not answer questions about how it chose Schoettle to do the review.

"We don't want to start a trial in the newspaper, because that's not fair to a judge and jury," Guthrie said.

WASHINGTON POST

SPECIAL REPORT THE COST OF HEALING How America puts the wrong price on healthcare.

2013 - How a secretive panel uses data that distort doctors' pay

By Peter Whoriskey and Dan Keating, Published: July 20, 2013

When Harinath Sheela was busiest at his gastroenterology clinic, it seemed he could bend the limits of time. Twelve colonoscopies and four other procedures was a typical day for him, according to Florida records for 2012. If the American Medical Association's assumptions about procedure times are correct, that much work would take about 26 hours. Sheela's typical day was nine or 10.

Graphic



"I have experience," the Yale-trained, Orlando-based doctor said. "I'm not that slow; I'm not fast. I'm thorough." This seemingly miraculous proficiency, which yields good pay for doctors who perform colonoscopies, reveals one of the fundamental flaws in the pricing of U.S. health care, a Washington Post investigation has found.

Unknown to most, a single committee of the AMA, the chief lobbying group for physicians, meets confidentially every year to come up with values for most of the services a doctor performs.

Those values are required under federal law to be based on the time and intensity of the procedures. The values, in turn, determine what Medicare and most private insurers pay doctors.

But the AMA's estimates of the time involved in many procedures are exaggerated, sometimes by as much as 100 percent, according to an analysis of doctors' time, as well as interviews and reviews of medical journals.

If the time estimates are to be believed, some doctors would have to be averaging more than 24 hours a day to perform all of the procedures that they are reporting. This volume of work does not mean these doctors are doing anything wrong. They are just getting paid at the rates set by the government, under the guidance of the AMA.

In fact, in comparison with some doctors, Sheela's pace is moderate. Take, for example, those colonoscopies. In justifying the value it assigns to a colonoscopy, the AMA estimates that the basic procedure takes 75 minutes of a physician's time, including work performed before, during and after the scoping.

But in reality, the total time the physician spends with each patient is about half the AMA's estimate — roughly 30 minutes, according to medical journals, interviews and doctors' records.

Indeed, the standard appointment slot is half an hour.

To more broadly examine the validity of the AMA valuations, The Post conducted interviews, reviewed academic research and conducted two numerical analyses: one that tracked how the AMA valuations changed over 10 years and another that counted how many procedures physicians were conducting on a typical day. It turns out that the nation's system for estimating the value of a doctor's services, a critical piece of U.S. health-care economics, is fraught with inaccuracies that appear to be inflating the value of many procedures:

•To determine how long a procedure takes, the AMA relies on surveys of doctors conducted by the associations representing specialists and primary care physicians. The doctors who fill out the surveys are informed that the reason for the survey is to set pay. Increasingly, the survey estimates have been found so improbable that the AMA has had to significantly lower them, according to federal documents.

•The AMA committee, in conjunction with Medicare, has been seven times as likely to raise estimates of work value than to lower them, according to a Post analysis of federal records for 5,700 procedures. This happened despite productivity and technology advances that should have cut the time required.

•If AMA estimates of time are correct, hundreds of doctors are working improbable hours, according to an analysis of records from surgery centers in Florida and Pennsylvania. In some specialties, more than one in five doctors would have to have been working more than 12 hours on average on a single day — much longer than the 10 hours or so a typical surgery center is open.

Florida records show 78 doctors — gastroenterologists, ophthalmologists, orthopedic surgeons and others — who performed at least 24 hours worth of procedures on an average workday. Some former Medicare chiefs say the problem arises from giving the AMA and specialty societies too much influence over physician pay. Hospital fees are determined separately. "What started as an advisory group has taken on a life of its own," said Tom Scully, who was Medicare chief during the George W. Bush administration and is now a partner in a private equity firm that invests in health care. "The idea that \$100 billion in federal spending is based on fixed prices that go through an industry trade association in a process that is not open to the public is pretty wild."

He said that, every now and again, former Medicare chiefs — Republicans and Democrats — gather for a lunch and that, when they do, they agree that the process is, at best, unseemly.

"The concept of having the AMA run the process of fixing prices for Medicare was crazy from the beginning," Scully said. "It was a fundamental mistake."

In response, the chair of the AMA committee that sets the values, Barbara Levy, a physician, acknowledged that "all of the times are inflated by some factor" — though not by the same amount.

But she defended the accuracy of the values assigned to procedures, saying that the committee is careful to make sure that the relative values of the procedures are accurate — that is, procedures involving more work are assigned larger values than those that involve less. It is up to Congress and private insurers then to assign prices based on those values.

"None of us believe the numbers are fine-tuned," Levy said. "We do believe we get them right with respect to each other." Moreover, the committee has reduced the valuations of more than 400 procedures in recent years to address such concerns, AMA officials said. Over that time, Medicare officials have increasingly looked askance at the AMA estimates.

But even though the AMA figures shape billions in federal Medicare spending and billions more in spending from private insurers, the government is ill-positioned to judge their accuracy.

For one thing, the government doesn't appear to have the manpower. The government has about six to eight people reviewing the estimates provided by the AMA, government officials said, but none of them do it full time.

By contrast, hundreds of people from the AMA and specialty societies contribute to the AMA effort. The association "conservatively" has estimated the costs of developing the values at about \$7 million in time and expense annually. The AMA and the medical societies, not the government, develop the raw data upon which the analysis is based.

Over the past decade, Medicare's payments to doctors have risen quickly. Medicare spending on physician fees per patient grew 58 percent between 2001 and 2011, mostly because doctors increased the number of procedures performed but also because the price of those procedures rose, according to MedPAC, an independent federal agency that advises Congress about Medicare. Yet public oversight of the AMA process is difficult.

Members of the public may attend committee meetings if they get the approval of the chairman, but even when they're invited, attendees must sign a confidentiality agreement. That is meant to prevent interim decisions from spurring inappropriate market speculation and industry confusion, AMA officials said.

Other groups that make recommendations to the government are governed by the Federal Advisory Committee Act, which requires that meetings be public and that documents be publicly available. But those requirements do not apply to the AMA committee, officials said, because the AMA is not formally considered an advisory committee.

Even so, the committee's influence on federal spending over time has been expansive: In some years, Medicare officials have accepted the AMA numbers at rates as high as 95 percent.

The fundamental question is difficult, even philosophically: What should a doctor make?

The forces that normally determine prices — haggling between buyers and sellers — often don't apply in health care. Prices are hard to come by; insurers do most of the buying; sick patients are unlikely to shop around much.

At its inception, the Medicare system paid doctors what was described as "usual, customary and reasonable" charges. But that vague standard was soon blamed for a rapid escalation in physician fees.

In the late 1980s and early '90s, the United States called on a group at Harvard University to develop a more deliberate system for paying doctors.

What they came up with, basically, is the current point system. Every procedure is assigned a number of points — called "relative value units" — based on the work involved, the staff and supplies, and a smaller portion for malpractice insurance.

Every year, Congress decides how much to pay for each point — this year, for example, the government initially assigned \$34.02 per point, though prices vary somewhat with location and other factors.

This point system is critical in U.S. health-care economics because it doesn't just rule Medicare payments. Roughly four out of five insurance companies use the point system for the basis of their own physician fees, according to the AMA. The private insurers typically pay somewhat more per point than does Medicare.

Once the system developed by the Harvard researchers was initiated, however, the Medicare system faced a critical problem: As medicine evolved, the point system had to be updated.

The AMA offered to do the work for free.

Today, the 31-member AMA committee that makes the update recommendations to Medicare — it is known as the Relative Value Update Committee, or RUC — consists of 25 members appointed by medical societies and six others. The chair is appointed by the AMA.

To inform its decisions, the committee relies on surveys submitted by the relevant professional societies. For example, in setting the value for a colonoscopy, the committee has turned to the American Gastroenterological Association and a similar group for information.

Typically, the surveys ask doctors about the time and intensity of the procedure under study.

The survey "is important to you and other physicians," the standard form tells doctors, "because these values determine the rate at which Medicare and other payers reimburse."

Sometimes the doctors within a specialty will overestimate the value of their work, Levy said. When that happens, the committee has increasingly decided to significantly lower their estimates of the work involved. "Suppose I am a cardiologist, and I think I am the most important thing on Earth," Levy said.

The RUC, she said, may have to say, "We know you're really important but" you've overestimated the work involved on the survey. "The 31 voting people around that table can be really harsh," Levy said. "Someone can come to us with data that looks skewed, and we tell them, 'It doesn't pass the smell test.'" But critics of the AMA process, including former Medicare chiefs and the Harvard researchers who created the system, say that biased surveys and other conflicts of interest make the results unreliable.

In developing the point system, the Harvard researchers and the government made available their raw data and statistical methods and held public meetings; they also limited the role of the AMA and specialist societies, participants in that process said.

The AMA process is not so open.

The current set of values "seems to be distorted," said William Hsiao, an economist at the Harvard School of Public Health who helped develop the point system. "The AMA fought very hard to take over this updating process. I said this had to be done by an impartial group of people. This is highly political."

Federal law makes the importance of time explicit: The work points assigned to a procedure will reflect the "physician time and intensity in furnishing the service" and includes the physician's time before, during and after a procedure. Every year, the Medicare system publishes its time estimates for every service, which are based on AMA surveys.

"Improving the accuracy of procedure time assumptions used in physician fee schedule ratesetting continues to be a high priority," agency officials wrote last year. "Procedure time is a critical measure."

To examine the plausibility of the estimated times, The Post analyzed the records for doctors who work in outpatient surgery clinics in Florida.

The doctors included ophthalmologists, hand surgeons, orthopedic surgeons and gastroenterologists.

The Post chose the outpatient surgery clinics for review because their surgery records for Medicare and private payers were publicly available. The calculations of physician time used by The Post are conservative because they do not include the procedures that the doctors performed at hospitals, where many such doctors also see patients. The counts also exclude secondary procedures performed on a given patient, as well as follow-up visits. Even so, for this group of doctors, the time estimates made by Medicare and the AMA appear significantly exaggerated.

If the AMA time estimates are correct, then 41 percent of gastroenterologists, 23 percent of ophthalmologists and 17 percent of orthopedic surgeons were typically performing 12 hours or more of procedures in a day, which is longer than the typical outpatient surgery center is open, The Post found in the Florida data.

Additionally, if the AMA estimates are correct, more than 3 percent of ophthalmologists and internists and more than 2 percent of orthopedic surgeons are squeezing more than 24 hours of procedures into a single day.

Florida is not unique. In a similar review of nine endoscopy clinics in Pennsylvania, The Post found 25 of 59 doctors at nine Pennsylvania gastroenterology clinics performed an average 12 hours or more of procedure time at least one day per week, with two totaling over 24 hours, rates similar to the Florida pattern. Ophthalmologist David Shoemaker is among the busiest doctors in Florida, performing 3,594 cataract surgeries and similar procedures last year. His workload of 30 to 40 surgeries per day on Mondays and Tuesdays amounts to 30-plus-hour workdays if AMA time estimates are correct. Yet he works about $10^1 / _2$ hours those days.

Shoemaker's seven locations of Centers for Sight have an all-in-one integration with testing, anesthesiology, preparation, surgery and post-operative care, said James Dawes, chief administration officer. "We shun the word 'assembly line,'" Dawes said. "We're in the patient care business, and every patient is unique. Every eye is unique. We've worked hard to make sure it doesn't feel like an assembly line."

The finding that doctors are working much more quickly than AMA assumes is supported by research by MedPAC that shows that the actual times of surgery were quite a bit less than the AMA-Medicare estimates. Using operating room logs, researchers calculated the average times of 60 key surgeries and invasive diagnostic procedures. For all but two of the procedures, the AMA estimates were longer. For example, while an abdominal hysterectomy took 138 minutes on average, the AMA said it takes nearly twice that long.

"Surgical times for other related services are likely to be overstated as well," researchers Nancy McCall, Jerry Cromwell and Peter Braun concluded. Braun helped create the point system with Harvard's Hsiao.

The AMA's Levy said the committee has developed other ways to estimate values that don't depend on time.

The critics don't "get the concept of where the [committee] is in 2013," Levy said. "We've evolved a bunch of processes that make them better than they were when Harvard did it."

Whatever its methods, however, the AMA panel has been raising the work points for procedures.

Between 2003 and 2013, the AMA and Medicare have increased the work values for 68 percent of the 5,700 codes analyzed by The Post, while decreasing them for only 10 percent.

While advances in technology and skill should have reduced the amount of work required, the average work value for a code rose 7 percent over that decade, largely because officials raised the value of doctors' visits. The rise came in addition to allowances for inflation and other economic factors.

When discussing the rise in the nation's bills for physicians, AMA officials note that they only assign points to procedures — so the Medicare bill depends upon how much the federal government decides to spend for each point.

Officials determine that spending by several complex formulas laid out in federal rules. One of them forces Medicare to lower how much it pays per point when work values rise significantly. Every year since 2003, however, the other formulas have been overridden by Congress, which has adjusted the payments independently.

That means it's difficult to definitively link the nation's rising Medicare bill to the increasing work values set by the AMA. However, critics say the AMA's time exaggerations undoubtedly help inflate the prices of many procedures.

Medicare officials have been trying to develop ways to more accurately quantify doctor work and are conducting two studies to refine its measurement.

The Medicare bureaucracy "takes into account a number of different factors and sources of information, including the RUC recommendations, when setting reimbursement rates for physicians," said agency

spokeswoman Tami S. Holzman. The acceptance rate of the AMA's values has fallen in recent years from 90 percent to about 70 percent.

"We want to ensure that relative payment rates for physicians' services are appropriate and fair," she said.

Most people don't time their own colonoscopies.

But Robert Berenson, a physician, a former Medicare official and now a fellow at the Urban Institute, has been a longtime skeptic of the time measurements. When he had his own, Berenson checked his watch.

The actual procedure time — "scope in to scope out" — was exactly half of what Medicare estimates.

"It reminds me of the Marx Brothers line: 'Who are you going to believe, me or your own eyes?'" Berenson said.

An estimated 15 million colonoscopies are performed annually in the United States, mainly to detect and prevent cancer in people older than 50. In the procedure, a tube with a video camera at the tip is inserted through the anus into the colon. Pictures from the inside appear on a screen.

In calculating how much should be paid for a procedure, the AMA and Medicare make some very specific time estimates.

For a colonoscopy, the total physician time is 75 minutes. This includes 25 minutes of evaluating and positioning the patient; five minutes for the physician to dress, scrub and wait; as well as 15 minutes afterward. The procedure itself is timed at 30 minutes. Berenson counted 15 minutes in his own procedure.

Likewise, a New England Journal of Medicine article reported that in a study of 2,000 different colonoscopies, the average duration of the basic screening

procedure was 13.5 minutes — not the 30 minutes estimated by the AMA. Similarly, it found that a colonoscopy with polyp removal took 18 minutes — as opposed to the 43 minutes estimated by the AMA.

The Post asked gastroenterologists if the procedure takes the 75 minutes estimated by the AMA. "Of my time?" said Frederick Ruthardt, a gastroenterologist in Uniontown, Pa., shaking his head. He performed hundreds of them in 2011, according to state records. "That sounds pretty high."

It is possible that in 1992, critics allow, when the price list was first developed, a colonoscopy actually took something close to 75 minutes. But in the decades since, the technology has undergone a revolution.

The tubular instruments are now far easier to move through the colon — the physician can stiffen or weaken the probe as necessary.

Meanwhile, digital technology has vastly improved the doctor's view. In the early 1990s, doctors had to hunch over an eyepiece similar to that of a microscope for a look; now the images are displayed on a large screen in high-definition video. "The evolution has saved labor and improved accuracy," said David Barlow, who has worked on developing the devices for decades and is now a vice president at Olympus America.

Indeed, some doctors said it has cut the time and discomfort in half. Yet despite these advances, the AMA and Medicare say the amount of work estimated in a colonoscopy essentially hasn't budged. The work involved was 3.7 "relative value units" or points in the early 1990s; after more than two decades of labor-saving advances, it is still worth 3.7 points. The typical Medicare price including overhead is about \$220.

The American Gastroenterology Association, a specialty group that advocates on behalf of the doctors who perform colonoscopies, said the number is justified despite the improvement in technology.

"The paradox is that we are spending more time than what you might assume," said Joel V. Brill, a gastroenterologist who served as a liaison between the association and the RUC. "Things that you might not have been able to see through the scope, you can see now."

Levy said the RUC is slated to review the code again in the coming year.

Two problems arise when some procedures are overvalued, according to the critics. First, it means some patients and insurers are paying too much.

Second, doctors may be more likely to perform those procedures than they otherwise would be.

Indeed, while health experts worry that many people who should be getting colonoscopies are not, it appears that some patients are getting too many.

Average-risk patients who have a colonoscopy that shows no signs of trouble are not supposed to receive another for 10 years, according to Medicare guidelines. But according to researchers at the University of Texas Medical School, about 46 percent of patients were getting another colonoscopy within seven years.

The finding, based on a review of 24,000 patient records and reported last year in the Archives of Internal Medicine, said that such colonoscopies were more likely to be performed by doctors rated as "high volume" providers. One of the study's authors, James S. Goodwin, a geriatrician at the University of Texas in Galveston, said doctors make decisions based on a large number of factors. But it's foolish, he said, to ignore the financial angles.

"Economic incentives in medicine are like the force of gravity," Goodwin said. "To pretend they don't exist is crazy. They're there."

So how much does a physician make on a basic colonoscopy? A good place to look is Pennsylvania, where the state tracks medical procedures and the profits of the doctor-owned surgery centers. Even in an otherwise down-atthe-heels former coal town, the procedure can be big business.

At Schuylkill Endoscopy, located in a tidy green building behind the McDonald's in Pottsville, Pa., three doctors performed thousands of colonoscopies in 2011, taking in more than \$700,000, along with hundreds of thousands more for other similar procedures. On top of those physician fees, the endoscopy clinic, which is owned by two of the physicians and a management company, took in \$1.5 million in operating profits in 2011, according to state records.

"I am very comfortable — very grateful," said one of the owner-doctors, Amrit Narula, who lives in a modern-style, 5,000-square-foot house atop a ridge here. Like other doctors interviewed for the story, Narula noted that he has no role in setting the Medicare value. He does not lobby Medicare and has never filled out one of the RUC surveys. He agreed that the time estimates in his field sound exaggerated.

By itself, the professional fee for a colonoscopy makes him about \$260 an hour after his expenses. (That's a figure that's based on the clinics' mix of patients and the Medicare assumptions about overhead.) Is that too much? In the past, the loudest criticism of the point system has come from primary care physicians who think their work has been undervalued.

The median salary for a gastroenterologist was \$481,000 in 2011, according to data from the Medical Group Management Association. By contrast, the median salary for a pediatrician was \$204,000 and that of a general internal medicine doctor was \$216,000. Those kinds of disparities are leading medical students away from primary care, critics say.

"I didn't know they got that many RVUs [points] for a colonoscopy — that's kind of amazing," said Cynthia Lubinsky, a family practitioner in the next county over from Narula. "Do I believe that the payment system is fair? I would have to say no."

Even if the method that the government uses for setting values is haphazard, however, the question of what doctors ought to be earning is unanswered.

It is an occupation, Narula said, that consumes one's life. It has required more than a decade of training: college, medical school, an internship and a fellowship. He visits patients every day after his work at the surgery center. He does rounds there every third weekend. He is on call every third night.

When the subject turns to fair compensation, he draws comparisons to other lines of work.

"What is the right price?" Narula asked. "Who can tell? A lawyer can charge \$400 an hour. My accountant charges me for 15 minutes of time even if he just opens an e-mail from me. And what about the bankers? . . . Ultimately, this is for society to decide."
