COST-EFFECTIVENESS OF CHIROPRACTIC HEALTHCARE

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Prepared at the request of the Vermont Chiropractic Association

November 2013

Mark Schoene, Editor of an international spine research newsletter from Georgetown University, recently declared that, "Spinal medicine in the US is a poster child for inefficient spine care."[1] And small wonder, when one considers that spine researchers have stated that medical primary care physicians are inept in their training for MS disorder.[2] Add to this the facts that (1) primary care physicians are prone to ignore recent guidelines that do not recommend narcotics,[3] and (2) primary care physicians are more likely to suggest spine surgery than surgeons themselves.[4]

To make matters worse, a recent Medical Expenditure Panel Survey in the U.S. revealed that the prevalence of low back pain in the U.S. increased by 29% from 2000-2007. For *chronic* low back pain, the figure was much worse. It was 64%. When it comes to dollars and cents, one is looking at a staggering 129% *increase* from $15.6B to $35.7B in the same period.[5] Total expenditures for back pain were even more sobering, pegged at $85.9B in 2005,[6] exceeded only by the 2007 outlay for cancer ($89.0B),[7] 2002 cost of diabetes ($98.1B),[8] or 2005 tab for heart disease and stroke ($257.6B).[9] In a study published in 2008, Martin, Deyo and others concluded that the average total health expenditure per person in the United States with spine problems was 73% greater than for individuals in other countries.[6] This particular statistic is only exacerbated by the fact that medical care costs have shown the greatest increase in inflation among the eight categories that make up the consumer price index, as shown in **FIGURE 1** :[10]

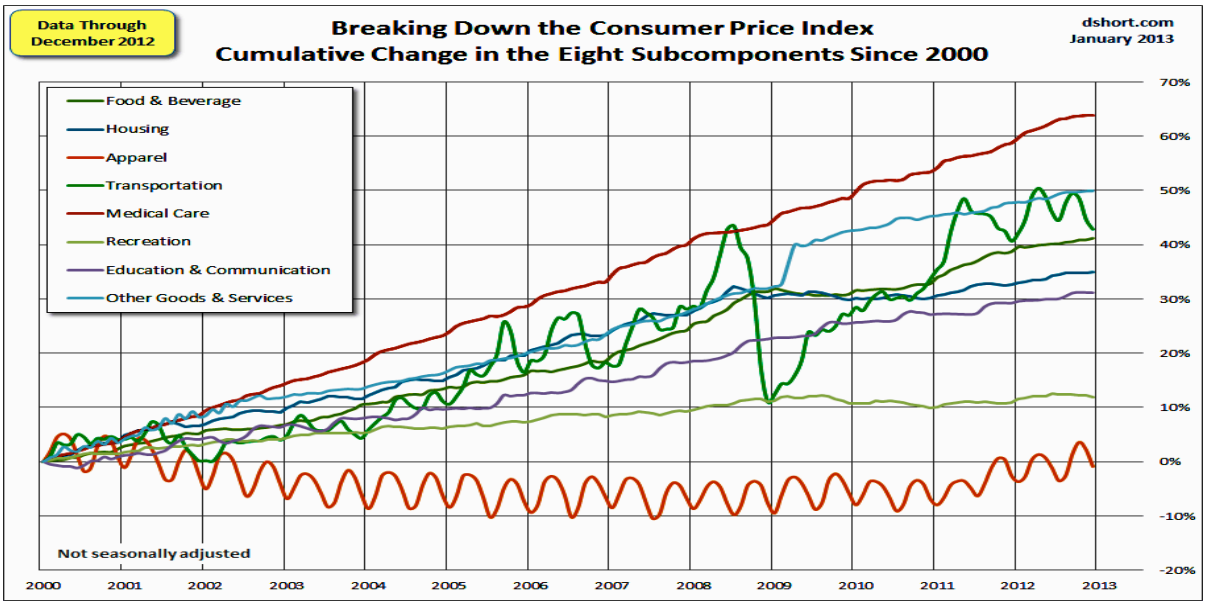

FIGURE 1: Trends from 2000-2013 in 8 subcomponents of the Consumer Price Index.

Representing but a tiny fraction of the problems which exist in excluding chiropractic from further exposure in America's healthcare system, these few pieces of information serve as the basis in which an review of the cost-effectiveness of the commonly

accepted scope of practice of chiropractic must be undertaken, as will be accomplished in this report. This study will be conducted in six parts, presented as a review of:

A. National healthcare expenditures: are we are getting our money's worth?.
B. Cost drivers in our healthcare system.
C. Optimal strategies for capturing costs accurately.
D. Comparisons of medical and chiropractic costs within insurance companies, Medicare, and workers compensation plans.
E. Steps taken to control escalating costs with greater emphasis upon conservative care.
F. Conclusions.

A. National healthcare expenditures: are we getting our money's worth?

1.Overall ranking and costs:

In a ranking of quality healthcare conducted by the World Health Organization, the United States ranked 37th on a list of 191. France, Italy, San Mariono, Andorra, Malta, Singapore, Spain, Oman, Austria and Japan were ranked among the top 10. In 2000, the United States was reported to spend an estimated $3,724 per person on health care, compared to $2,125 in France and $1,759 in Japan.[11,12] Just 9 years later, the per capita expenditure on health care in the United virtually *doubled* to $7,290 and was twice as high compared to 6 other developed countries (Australia, New Zealand, Canada, The Netherlands, Germany, and the United Kingdom) against which the United States was ranked *last* in terms of quality care, access, efficiency, equity, and producing long, healthy, and productive lives.[13]

Thus it is not surprising that a recent editorial in the New York Times reported that nearly 25% of American adults either could not pay their medical bills or had difficulty meeting them, compared with less than 13% in France and 7% in five other countries. Even adults who were fully insured were more likely than their counterparts abroad to forgo care because of costs, reflecting the poor coverage of some insurance policies. Accordingly, 32% of consumers spend considerable time on insurance paperwork or in disputes with their insurers over denials of payments for services that were believed to be covered.[14]

A recent study by the Commonwealth Fund revealed that the United States could save $2 trillion on healthcare costs over 10 years if it were to hold the $2.8 trillion national healthcare system to its annual spending target by having Medicare, Medicaid, and other government programs and private insurers encourage providers to accelerate adoption of more cost-effective care.[15]

2.Spine and musculoskeletal burden:

Expenditures for spine problems represented a staggering 666% increase from 1984,[16] and a 327% jump from 1997.[17] Specifically for low back pain and neck pain, expenditures in the United States rose by 65% in inflation-adjusted dollars from 1997-

2004, while measures of physical functioning, mental health and work, school and social activities among patients with spinal related disorders actually *declined*. From 1994-2004, low back pain-related Medicare expenses increased by 629% for epidural steroid injections, 423% for opioid medications, 307% for MRIs, and 220% for lumbar fusion surgeries, while chronicity and disability related to spinal related disorders have steadily *increased.*[18] Specifically, the estimated proportion of persons with back or neck problems increased from 20.7% in 1997 to 24.7% in 2005.[6]

If the total cost, including indirect and indirect lost wages was figured in, the disease burden in the United States from 2002-2004 was $849B, or 7.7% of the gross national product.[19] One in two adults reported a chronic musculoskeletal condition in 2005, twice the rate of reported chronic circulatory or respiratory conditions.[20] Musculoskeletal injuries resulted in more than 53M healthcare visits in 2004, 60% of all injury treatment visits. Now it is estimated that more than 30% of Americans require health care because of a musculoskeletal condition.[21] In terms of disability and lost work time due to musculoskeletal conditions: (a) 7% of the U.S. population reported difficulty performing routine activities,[22](b) back pain was the cause of 313.5M bed days and 186.7M lost work days in 2004,[22] (c) one-third of days away from work were attributable to musculoskeletal disorders for work-related injuries,[23] and (d) hip fractures are associated with chronic pain with a 20% mortality rate in the first 20 months.[24]

B. Cost drivers in our healthcare system:

1.Medical errors overall:

Conservative estimates reveal that at least 200,000 Americans die from preventable medical errors each year.[25,26,27] In 2008, medical errors cost the United States $19.5B, with $17B directly associated with additional medical costs (ancillary services, prescription drugs, inpatient and outpatient care), $1.4B attributed to increased mortality rates, and $1.1B due to 10M days of lost productivity.[27]

2. Prescription medications:

The cost of prescription medications in 1995 was $7.3B, representing 14% of total direct expenditures for healthcare. Just 12 years later, that figure rose to $19.8B, constituting 23% of total direct expenditures and representing a 271% increase.[6] Particularly unsettling is the fact that, back in 1998, the costs of prescription drugs for treating back pain was just over 15% of the total expenditures for this condition, representing an increase *that was more rapid than any of the other health service expenditures (inpatient, outpatient, office-based, emergency room, and home health)*[17] In fact, most of the 65% increase in spine care costs from 1997-2005 could be attributed to drugs.[6] For children under 19 years of age, spending on prescription medications was reported to have increased by 28% in 2001, mostly for allergies, asthma, and infections for drugs that were actually approved for adults.[28] For the elderly, drug prices doubled from 1992-2000 with another doubling expected through 2010.[29]

In terms of adverse events:

a. For NSAID use, more than 100,000 hospitalizations representing $2B in additional healthcare costs and 17,000 deaths occur each year;[30,31] NSAID use has been associated with cardiovascular mortality, especially in the elderly.[32]
b. For narcotic use, 700 poisoning deaths were reported from 2003-2007.[33]
c. Recently, the Centers for Disease control reported that 9/10 poisonings are related to prescription drug abuse, 40% related to pain medication alone.[34]

3. Surgery:

Increases in spinal surgery from 1996-2001 include a 77% rise in spinal fusions (costing $34,000 excluding professional fees) and an over 13% increment in hip replacements and knee arthroplasties.[35] Complications in spinal surgery have included:

a. Among Medicare patients compared to any operations without fusion, surgery has been associated with [1] a doubling of the risk of complications, [2] an increase in the rate of blood transfusions by a factor of 6, and [3] the doubling of postoperative mortality at 6 weeks.[36]
b. Instrument failure in 7% of cases;[37]
c. Complications at the bone-donor site involving infection and chronic pain, occurring in 11% of cases;[37] and
d. Blindness, though rare, probably due to ischemic injury with intravascular volume shifts during surgery.[38]

Errors in surgery, known as “never events,” have been reported to occur 4000 times each year[39] with a 6.6% mortality rate, permanent injury in 32.9% of patients, and $1.3B in malpractice payments during the period 1990-2010.[40] As far back as 1995, the total number of lower back surgeries in the United States was found to exceed 250,000 per year.[41] With the Congressional Committee on Interstate and Foreign Commerce having found that 17.6% of all surgeries were unnecessary,[42] the total number of excessive back surgeries each year would have approached 44,000. Among multiple operations (arthroscopy, acromioplasty, hysterectomy) conducted each year that have been deemed questionable, 125,000 spinal fusions each costing $30,000 have been challenged.[43]

C. Optimal strategies for capturing healthcare costs accurately:

Typically, initial chiropractic visits including a complete medical evaluation, diagnosis and treatment. Numerous comparisons have been made with the costs which would be encountered in visits to a medical physician. Here it is essential to note that most costs for chiropractic visits are *included* in the bill received from the chiropractor's office, whereas in the medical course of treatment, external costs such as [i] referrals to medical specialists including physical therapists, [ii] the purchase of medications, and [iii] laboratory tests, most costs from the medical provider per se are not. In actual figures, it has been shown that 80% of the total cost of chiropractic treatment is billed from the chiropractor, whereas only 20% of the total medical costs of treatment appear on bills directly from the medical physician.[44] Even though the total number of visits to a chiropractic office for treating a given episode may be numerous, therefore, the patient

needs to be mindful of this accounting.

To begin with appraisal of cost-effectiveness studies, one must assess the minimal criteria and common deficiencies of cost-effectiveness studies. In reviewing cohort studies in occupational low back pain, Baldwin identifies 6 requirements:[45]

1. The sample must be identified immediately after the onset of pain.
2. The study must obtain data on the prior history of back pain.
3. Standardized outcomes measures must be collected.
4. The total costs of an episode of back pain must be measured accurately.
5. Costs must be evaluated from the viewpoint of a pre-identified payer.
6. Multivariate models must be used to control for patient differences.

Looking at the other side of the coin, Branson has cited 5 common *deficiencies* in investigations pertaining to cost-effectiveness:[46]

1. Patient characteristics (severity, chronicity) are not factored in.
2. Standardized diagnoses within or between providers is not controlled in retrospective studies.
3. Payments actually received as not the same as those billed.
4. There is an absence of all direct costs, such as (a) all visits to the provider, (b) prescription and nonprescription drugs or supplements, (c) laboratory costs, (d) diagnostic imaging, (e) referral to specialists, and (f) hospital costs.
5. There is a poor representation of *indirect* costs, such as (a) workdays lost by the patient, (b) retraining for replacement labor, (c) caregivers to assist in domestic duties, (d) iatrogenic events, and (e) legal costs.

The best method for capturing both direct and indirect costs in cost-effectiveness research requires a validated *cost diary* including three components:[47]

1. Direct healthcare costs (impacts of interventions on use of healthcare services):
    a. Visits to the general practice.
    b. Specialist care.
    c. Alternative medicine use.
    d. Physiotherapy.
    e. Days of hospitalization.
    f. Prescribed medications.
2. Direct nonhealthcare costs (costs incurred by the patient and family):
    a. Costs of over-the-counter medications.
    b. Cost of health activities.
    c. Hours of paid and unpaid household help.
    d. Transportation.
    e. Other relevant out-of-pocket expenses.

3. Indirect costs (value of productivity loss due to illness):
    a. Number of days absent from work.
    b. Days lost from housekeeping and other daily activities.

To this list, one should include the calculation the *actual productivity* (efficiency of work production) of an individual compared to what was determined prior to the onset of disability, rather than simply counting days lost.

D. Comparisons of medical and chiropractic costs:

1. Databases from insurers and practitioners:

Insurance companies often use larger databases, which are less prone to possible skewing by regional workers' compensation data. The challenge still exists however, that problems remain for all retrospective studies in that all claims filed require verification to be certain that they correspond to the actual conditions experienced and treatments rendered.

Several earlier studies from Utah,[48] Iowa,[49] and Florida[50] provided preliminary data which suggested a significant savings in costs when chiropractic was compared to medical care for back problems. Perhaps even more important was the fact (often neglected in cost-effectiveness studies as suggested above) that days lost from work were significantly less for patients under chiropractic care.[48-50] Other early data, opposed to virtually all other studies, suggested that chiropractic care was more expensive and prolonged.[51]

A key conceptual advance representing the bundling of the full costs of episodes (i.e., the careful inclusion of all relevant treatment costs, not solely the costs of out-patient doctor visits) associated with either the medical or chiropractic care of patients was accomplished by Stano, and economist at Oakland University in Michigan. Factoring in key patient demographic and insurance characteristics as well as case mix severity differences, Stano ran final cost comparisons in a total of 6799 patients from a total database of over 400,000. His conclusions were straightforward and dramatic. When all episodes of care were considered, the mean total costs were $1000 for each medical episode and $493 per chiropractic episode.[52] Indeed, data such as this had led Stano to declare:

> "..we believe that the wide gap in the overall cost experience between chiropractic and Medical patients cannot easily be dismissed even by skeptics of the chiropractic profession…*Further evidence of chiropractic's clinical and cost effectiveness would represent a major breakthrough in this nation's effort to promote quality while controlling the growth of health care spending* (italics mine)."[53]

As will be demonstrated in the pages to follow, evidence to fulfill this challenge has been clearly provided.

Later observational studies by the same author at 13 general medical practices and 51 chiropractic, community-based clinics revealed slightly higher rather than lower chiropractic costs. However, the data were misleading in that (a) the distributions of total costs were highly skewed, especially for the chiropractic group, (b) prescription drug costs

from the charts of medical patients may be underestimated, (c) the costs for imaging or referral services rendered or independently sought by patients outside the sample providers' clinics were not included, (d) a disproportionately high percentage of chiropractic patients (42%) paid undiscounted out-of-pocket whereas only 7% of medical patients did so, and (e) costs for patients who might have undergone surgery were not considered.[54]

One of the same authors revisited the issue of cost-effectiveness three years later with a cohort of 2780 patients visiting either 60 chiropractors or 11 medical doctors in their own offices and concluded that, although chiropractic costs continued to be higher, they were more than offset by the fact that clinically important differences in pain and disability improvement were found only in the chiropractic patients. Coupled with greater patient satisfaction and considering the importance of *indirect* costs, the authors now concluded that chiropractic care appeared to be relatively cost-effective for chronic patients.[55] The same conclusion regarding quality of life and cost-effectiveness of spinal manipulation was echoed in a much larger study in actual treatment settings in the United Kingdom. [56]

If chiropractors were admitted into Alternative Medicine Incorporated (AMI), an integrative service as gatekeepers in an Independent Physicians' Association (IPA), dramatic cost reductions were observed in several investigations. In a retrospective study over a 4-year period by Sarnat, striking changes were evident as shown in **TABLES 1 and 2**.[57]

TABLE 1
Performance Comparisons of AMI with Traditional HMO

	%HMO Statistics
1. Hospital-based data:	
a. Hospital admissions/1000	57.0
b. Hospital days/1000	41.6
c. Average length of stay	76.2
2. Outpatient-based data:	
a. Surgical cases/1000	56.8
b. Pharmaceutical usage (cost)	48.2

TABLE 2
Total Hospital Days Compared to Other Major HMOs in Illinois

	%AMI Statistics
HMO Illinois	33.3
Personal Care Insurance Company of Illinois	35.9

Prudential Health Care Plan	40.3
United Healthcare of the Midwest	48.6
CIGNA Healthcare of Illinois	57.2
Aetna US Healthcare of Illinois	64.7
Humana Health Plan, Inc.	64.3

Referral rates and audit scores for AMI and traditional HMOs were the same with patient satisfaction scores actually at least 10 points higher for AMI. What this study clearly demonstrated was that:

1. A select group of chiropractic physicians successfully functioned in both a safe and effective manner as primary care physicians in a gatekeeper HMO model.
2. These same chiropractic physicians were capable of initiating and coordinating care for patients with a broad spectrum of disease states, representing a broader variety of diagnostic presentations than sometimes reported from chiropractic offices.
3. The magnitude of improvement in clinical and cost outcomes compared to normative values from the traditional HMOs was so large that it is difficult to dismiss as purely the result of population bias.[57]

In an updated study over a 7-year period, clear decreases in four significant and cost-determining parameters were sustained by AMI compared to traditional HMOs: (a) 60% in hospital admissions, (b) 59% in hospital stays, (c) 62% in outpatient surgeries and procedures, and (d) 85% in pharmaceutical costs.[58]

A retrospective claims analysis of Blue Cross Blue Shield's intermediate and fully insured population in Tennessee from October 1, 2004 to September 30, 2006 added further evidence of the cost-effectiveness of chiropractic care. It was based upon open access to medical doctors or chiropractors through self-referral without any differences in limits to the number of visits or copays to provider types. The study was based upon an episode of low-back pain, each new episode counted as a 60-day window without an encounter with a healthcare provider. The results were striking, as shown in **TABLE 3**:

TABLE 3
Blue Cross/Blue Shield Cost Comparison: Chiropractic vs Medical

	n	Mean	Standard Error	%Savings
Paid amount: DC	36,280	$452.23	$ 8.03	38.9%
MD	66,158	$740.07	$10.73	
Risk-adjusted DC	36,280	$532.54	$ 9.56	19.5%
MD	66,158	$661.10	$29.16	

The conclusions were that paid costs for episodes initiated with a chiropractor were almost 40% less than episodes of care initiated with an M.D. Even after risk adjusting each patient's costs (to illuminate the effects of severity on costs), DC episodes of care cost 20% less.[59]

Another perspective was offered by an insurance plan in a 4-year retrospective claim analysis, comparing 700,000 health plan members with an additional chiropractic coverage benefit and 1M members of the same health plan without the benefit. Including the chiropractic benefit resulted in (a) lower annual total healthcare expenditures ($1,463 vs $1,671), (b) lower average back pain episode-related costs for back pain patients ($289 vs $399), (c) a reduction of claims through medical doctors, and (d) lower utilizations of plain radiographs, magnetic resonance imaging, back surgeries, and hospitalizations. The savings were even greater than those reported because all pharmacy costs, costs of physical therapy on referral, and post-surgical patients were omitted. The sheer magnitude of the study group made this one of the largest analyses ever performed on the economic impact of chiropractic; however, it needs to be noted that this study was confined to one health plan in one state and that cause and effect have not been firmly established. Nevertheless, the trends of these data are undeniable.[60]

One corollary of this study was to ask whether adding the chiropractic benefit created an additional demand for medical care services, thereby adding significant costs. An investigative group from the same insurance firm responsible for the previous study[60] found that the presence of the chiropractic benefit did not appear to increase the number of patients seeking care for neuromusculoskeletal conditions, offering substantial refutation to this argument.[61] A second outgrowth of these investigations was to compute the actual costs of surgery, CT/MRI, plain-film radiography, and surgery for patients with or without the benefit. Those individuals with the benefit incurred reductions of costs in these categories from 2-25% for back pain and 13-31% for neck pain.[62]

2. Workers' Compensation Data:

Attention is immediately drawn as to how healthcare dollars might have been inappropriately spent for back pain in workers' compensation from disbursements recorded, in which benefits were disbursed by the State of Georgia to medical and chiropractic physicians from 2001-2008 according to the data shown in **TABLE 4**:[63] Here it can be seen that chiropractors received less than 2% of the funds paid to medical physicians and 8% or less in most years of the disbursements paid to physical therapists. Physical therapists, on the other hand, routinely received an order of magnitude greater share of the amounts disbursed to chiropractors, ranging from over 15% to greater than 23%. Since low back pain has been proposed to represent 33% of all workers compensation costs and 16% of all workers compensation claims,[64] it is immediately apparent that chiropractic care may not represent a significant cost burden as suggested by such entities as the Workers Compensation Research Institute in their earlier reports.[65,66] Indeed, one of the major methodological concerns which compromises the data from the latter study group is that costs of providers other than chiropractors were split into separate categories, whereas all costs relating to chiropractors were bundled into a single entity.[65,66]

Retrospective data from the Division of Workers' Compensation Claims in Florida revealed drastic savings when chiropractic was compared to non-chiropractic care for specific low back injuries during the period 1994-1999. Here total costs per claim were less than half for chiropractic care ($7,500 vs $16,500); the average time required to reach maximum medical improvement was 37% less (161 vs 219), and the average number of days required to return to work was reduced by 30% as well (77 vs 130). Incredibly and most shocking was the fact that, during this same period, utilization of chiropractors for such injuries decreased by 75% with at most only a 15% reduction of the number of cases treated by non-chiropractors. These data are presented in **FIGURE 2**.[67]

TABLE 4

Workers Compensation Data for Back Pain in Georgia, 2001-2008

Claim Group	YEAR			
	2001	2002	2003	2004
A. M.D	$115,590,118	$ 98,419,180	$71,025,150	$18,786,118
Pharmacy	22,426,219	16,292,692	13,310,026	2,228,745
B. P.T.	24,696,617	22,731,637	15,669,193	4,087,587
C. D.C.	850,247	641,805	581,687	184,654
C/A (%)	0.7	0.7	0.8	1.0
C/B (%)	3.4	2.8	3.7	4.5
B/A (%)	21.4	23.1	22.1	21.8

Claim Group	YEAR			
	2005	2006	2007	2008
A. M.D	$ 130,307,360	$362,446,563	$399,633,913	$334,813,733
B. P.T.	20,198,688	56,028,827	65,088,871	55,078,650
C. D.C.	793,589	4,484,855	7,583,844	4,241,274
C/A (%)	0.6	1.2	1.8	1.3
C/B (%)	3.9	8.0	11.7	7.8
B/A (%)	15.6	15.5	16.3	16.5

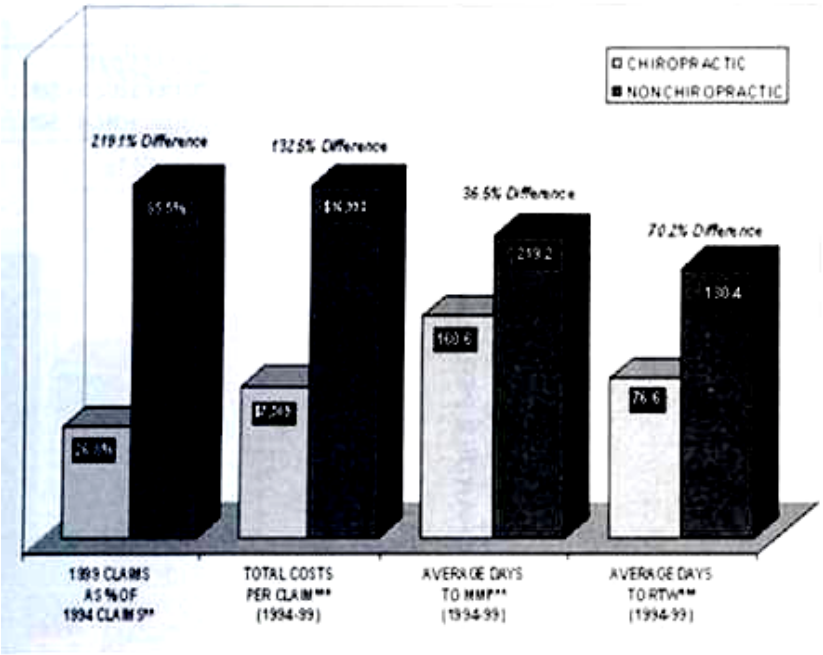

FIGURE 2: Workers' compensation costs in Florida: Estimated potential savings through use of chiropractic services for musculoskeletal problems.

A more detailed tabulation of the comparative costs of chiropractic and non-chiropractic services in managing musculoskeletal disorders is presented in **TABLE 5**.[68]

TABLE 5
Workers' Compensation Costs in Florida: Estimated Potential Savings, 1994-1999

Item	Lower Back[a]	Other[b]
Number of chiropractic claims[c]	63,343	224,741
Non-chiropractic:[c]		
Total costs:	$ 1,076,678,243	$ 3,450,190,140
Costs/claim	$ 16,998	$ 15,352
Chiropractic:		
Total costs:[d]	$ 462,973,987	$ 2,139,983,802
Costs/claim:[e]	$ 7,309	$ 9,522
Estimated savings/claim	$ 9,689	$ 5,830
Estimated total savings[d]	$ 613,704,256	$ 1,310,206,338

[a]Includes contusions, sprains, strains, other specific injuries, other cumulative injuries, multiple injuries to lower back.
[b]Includes contusions, fractures, lacerations, sprains, strains, and other specific injuries to single and multiple body parts, excluding single body part injuries to the lower back.
[c]Total injury-specific claims and costs where less than 50% of professional services were attributed to D.C.
[d]Total costs and savings that result when "Non-Chiropractic Costs per Claim" are adjusted to "Chiropractic Costs per Claim."

[e]Average injury-specific costs per claim where 50% or more of professional fees were attributed to D.C.

Much the same pattern was found in Texas. In this instance, the authors retrieved over 70 articles, reports, published studies, and treaties on the costs and effectiveness of chiropractic care and analyzed data on nearly 900,000 Texas Workers Compensation Claims from 1996-2001. The expenses resulting from lower back injuries amounted to $792.6M, with lower back and neck injuries accounting for 38% of the total claims costs. Here, chiropractors treated 30% of workers with lower back injuries but accounted for just 9.1% of the total costs and 17.5% of the medical costs,[69] mimicking the previously discussed results from Georgia[63] representing the disproportionately low benefits apportioned to chiropractors. The average claim cost was $15,884, found to decrease to $12,202 when a worker with a lower back injury received at least 75% of care from a chiropractor. That figure fell to $7,632 when at least 90% of that care was given by a chiropractor. These figures did not even include the cost of pharmaceuticals, shown earlier in this report[6,28,29] to contribute a substantial portion to overall costs of medical treatment.[69]

These same trends persisted in the state of North Carolina, in which a retrospective review of 96,627 claims between 1975 and 1994 archived by the North Carolina Industrial Commission produced the same compelling and ultimately unsettling data. Here it was shown that the treatment costs, total costs, and total time of disability for medical providers was $3,519, $17,673, and 176 days, respectively. The corresponding figures for chiropractic care, on the other hand, were just $663, $3,318, and 33 days. Just as shown previously,[63,69] the utilization rates for medical (85.4%) and chiropractic (0.8%) providers were far from equal.[70]

Oklahoma yielded similar findings, in which a 41% savings in direct costs with expanded access to chiropractic care for lower back sprains and strains was demonstrated. A comparison of the cost savings realized by chiropractic services for the aforementioned states of Florida, Texas, and Oklahoma revealed substantial savings in all three instances, shown in **TABLE 6:**[71]

TABLE 6
Workers Compensation Cost Savings in Florida, Texas, and Oklahoma

Savings Type	Florida	Texas	Oklahoma
Dollar	$19,582,862	$8,797,160	$14,190,011
Percent	57.0	25.6	41.3

The comparison of these three states undertaken by the Unified Chiropractic Association of Oklahoma pointed out that the lost-time claims by body part in 2000 were very similar,

with close to half or more involving the trunk and upper extremities, as shown in **FIGURE 3:**[71]

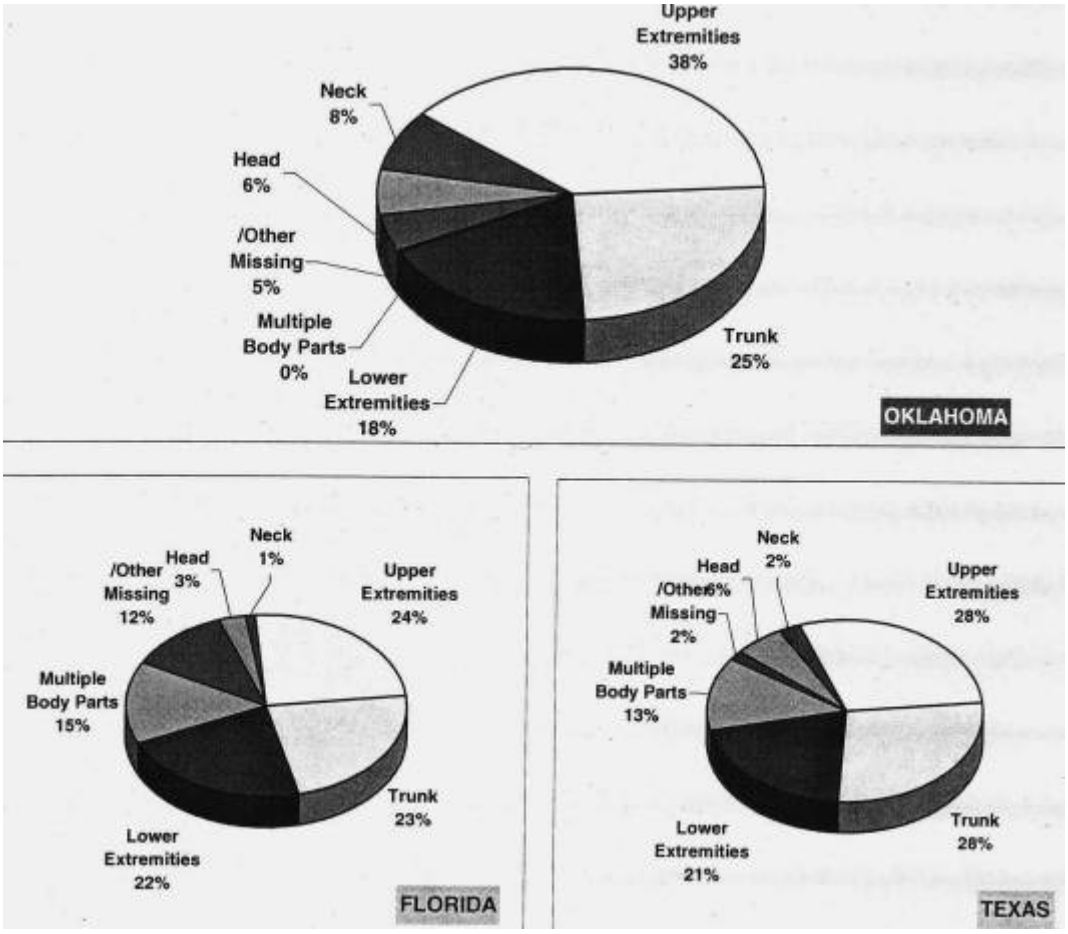

FIGURE 3: Lost-time claims by body part in Workers' Compensation Claims by state in 2000.

Some of the most dramatic data demonstrating the cost-effectiveness of chiropractic healthcare deliver has emerged from the CompScope reports from New Jersey issued by the Workers' Compensation Research Institute. For their analysis of a 12-month period from 2009-2010, the following key points can be gleaned from **TABLE 7.** The data speak for themselves: [72]

TABLE 7
SYNOPSIS OF WORKERS' COMPENSATION DATA FOR NEW JERSEY, 2009-2010

1.Medical payments per claim, >7 days of disability, 12 months, 2009/2010 were distributed to healthcare providers as follows:

- **a.** 44.1% medical physicians
- **b.** 10.1% PT/OTs
- **c.** 0.1% chiropractors

It is abundantly clear that chiropractors are not part of the escalating healthcare costs experienced in Workers' Compensation distributions in the years 2009-2010 in New Jersey.

2.Average cost/claim: Nonhospital providers, >7 days of disability, 12 months, 2009/2010:

	NJ	%	16-State Median	%
Physicians:	$5720	100	$3910	100
Chiropractors:	**978**	**17**	**1270**	**32**
PT/OT:	2517	44	2391	61
Others in Phys Med	$6930	100	$4917	100
Chiropractors:	**978**	**14**	**1270**	**26**

Clearly, average payments per claim for chiropractors in physical medicine were substantially **less** than those issued to physicians or to PTs and OTs in New Jersey.

3. Average medical payment/visit, 12 months, 2009/2010:

	NJ	%	16-State Median	%
Others in PhysMed	366	100	275	100
Chiropractors:	**133**	**36**	103	37

Clearly, average payments per visit for chiropractors in physical medicine were substantially **less** than those issued to physicians or to PTs and OTs in New Jersey.

4. Average medical payment/claim, 12 months, 2009/2010:

	NJ	%	16-State Median	%
Total	**$3798**	**131**	$2904	100
<7 days disability	**1111**	**109**	1020	100
>7 days disability	**12874**	**149**	8641	100
Total nonhospital	**7549**	**126**	5971	100

Clearly, average medical payments per claim in New Jersey exceeds the 16-state median by a substantial margin, (31%) suggesting that additional cost controls are needed. With cost-effective chiropractors having been largely excluded while New Jersey's costs are escalating compared to the 16-state median, a change of this policy is suggested.

5. Trends of average payments/claim, >7 days of disability, 12 mo., 2004-2005 base years:

Year	Physician		**Chiropractor**		PT/OT		Nonhospital Worker	
	NJ	Median	**NJ**	**Median**	NJ	Median	NJ	Median
2005-2006	5.4	4.3	**-27.7**	**2.2**	5.1	3.7	5.3	8.6
2006 -2007	11.0	8.4	**-40.1**	**3.1**	-0.3	10.3	9.3	12.3
2007-2008	19.0	13.4	**-17.2**	**1.7**	7.5	14.7	17.4	17.3
2008-2009	33.0	21.5	**-11.9**	**0.1**	10.3	13.7	30.5	24.5
2009-2010	35.0	28.1	**-31.2**	**0.6**	15.8	28.1	31.3	33.9

Unlike medical physicians, PT/OTs, and nonhospital workers, chiropractors in New Jersey have shown a **precipitous decline and in deeply negative territory** in the trends of the amount of average payments/claim over the 5-year period ending in 2010. The trend of payments to chiropractors in New Jersey is also in stark **contrast** to the trend to these providers in the 16-state median sampled by the WCRI.

6.Trends of average utilization/claim, >7 days of disability, 12 mo., 2004-2005 base years:

Year	Physician		**Chiropractor**		PT/OT		Nonhospital Worker	
	NJ	Median	**NJ**	**Median**	NJ	Median	NJ	Median
2005-2006	-5.1	4.4	**-24.2**	**-4.9**	5.2	1.5	-0.8	3.4
2006 -2007	-7.6	7.6	**-33.3**	**-5.8**	-3.6	3.4	-6.1	5.9
2007-2008	-3.9	6.4	**-0.9**	**-7.6**	1.2	4.8	-2.4	7.6
2008-2009	4.0	9.8	**-16.4**	**-9.3**	7.7	9.8	8.2	11.3
2009-2010	12.7	13.5	**-26.8**	**-4.0**	14.5	17.5	15.7	17.7

Unlike medical physicians, PT/OTs, and nonhospital workers, chiropractors in New Jersey have shown **declines [precipitous in 4/5 years sampled] and in deeply negative territory** in the trends of utilizations per claim over the 5-year period ending in 2010. The magnitude of this decline in New Jersey is also **of substantially greater magnitude in 4/5 of the reference years** to the trend to thee providers in the 16-state median sampled by the WCRI.

7. Trends of average price, >7 days of disability, 12 mo., 2004-2005 base years:

Year	Physician		**Chiropractor**		PT/OT		Nonhospital Worker	
	NJ	Median	**NJ**	**Median**	NJ	Median	NJ	Median
2005-2006	3.8	3.6	**-1.2**	**4.6**	-0.5	1.9	2.6	3.1
2006 -2007	5.0	4.3	**-3.9**	**0.0**	0.0	4.6	6.5	5.4
2007-2008	3.1	8.4	**-0.4**	**0.2**	6.3	6.9	10.3	7.9
2008-2009	4.6	10.8	**3.1**	**-0.6**	0.5	6.6	12.9	9.6
2009-2010	6.9	15.5	**2.0**	**2.6**	5.6	12.7	20.0	14.4

The trend of the average price per claim to chiropractors in New Jersey is **substantially**

less and often negative, in sharp contrast to that seen for medical physicians, PT/OTs, and nonhospital workers over the 5-year period ending in 2010.

8. Trends of average #visits/claim, >7 days of disability, 12 mo.,, 2004-2005 base years:

Year	Physician		**Chiropractor**		PT/OT		Nonhospital Worker	
	NJ	Median	**NJ**	**Median**	NJ	Median	NJ	Median
2005-2006	-3.8	1.5	**-18.4**	**-5.8**	-0.4	0.6	-1.5	1.8
2006 -2007	-3.8	2.4	**-22.5**	**-8.6**	5.2	3.0	-3.7	3.8
2007-2008	-3.9	1.5	**20.0**	**-6.5**	-2.6	3.8	-2.1	4.4
2008-2009	-3.2	4.0	**-6.5**	**-7.7**	-2.6	6.0	1.6	5.4
2009-2010	0.4	5.8	**-37.2**	**-10.8**	3.0	7.5	5.0	11.0

The trend of the average number of visits per claim to chiropractors is **sharply lower and in deeply negative territory** compared to that recorded for medical physicians, OT/PTs, and nonhospital workers over the 5-year period ending in 2010.

9. New drivers of growth in medical payments per claim in the years 2007-2009 were:
- **a**. Utilization of nonhospital services.
- **b.** Hospital outpatient payments per service.

Very similar data were produced by the Workers' Compensation Research Institute in earlier editions of their assessment of Workers' Compensation payments in New Jersey as well.[73]

Similar findings could be extracted from studies overseas. Ebrall's study of the Victorian WorkCare Scheme in Australia from the early 1990s matched 998 medical with an equal number of chiropractic claims for patients with mechanical low-back pain and found that the number of compensation days was 392 when the provider was a chiropractor and 774 when the provider was a medical practitioner. The average compensation payment was four times greater with medical management ($1,569 vs $392). Ebrall concluded that the comparison demonstrated that:

a. A significant reduction was seen in the number of claimants requiring compensation days when chiropractic care was chosen;'
b. Fewer compensation days were taken by claimants who chose chiropractic care;
c. More patients progressed to chronic status when medical care was chosen; and
d. The average payment per claim was greater with medical management.

Ebrall's conclusion was straightforward:

"The financial and social savings inherent in the chiropractic approach would be maximized
by [i] an increased participation rate by chiropractors in the WorkCare system, and [ii]

increased early referral of claimants with MLBP [mechanical low back pain] by medical

practitioners to chiropractors."[74]

Similar data from the WorkCover Authority in a neighboring province (New South Wales) during the same period revealed that the average chiropractic treatment cost for 20 randomly selected cases was $299.65, less than half the $647.20 average medical treatment cost per case.[75]

3, Medicare data:

In viewing the cost of physician services through the lens of Medicare, similar advantages to chiropractic care could be found. Muse & Associates undertook an examination of the utilization, cost and effects of chiropractic services on Medicare program costs compared to similar data for beneficiaries treated by other provider types. Using data from a compilation from the Centers for Medicare and Medicaid Services, the study group compared the data from 1.5M (26.8%) who received chiropractic care against the remainder of the 5.8M total who did not. Beneficiaries who received chiropractic care displayed significant cost savings, shown in **TABLE 8**:[76]

TABLE 8
Cost Savings in Medicare Benefits for Chiropractic Services

Payment Option	Chiropractic	Medical
Payments per capita, all Medicare services	$4,426	$8,103
Average Medicare payments per capita, selected services	380	594
Average Medicare payments per claim, all services	133	210
Average Medicare payments per claim, selected services	48	149

Furthermore, for selected musculoskeletal conditions, a lower proportion of beneficiaries receiving chiropractic care had a second encounter with a physicians (14% vs 34%), or a third encounter with a physician (11% vs 20%). For the total Medicare population, fewer beneficiaries receiving chiropractic care had a second encounter with a physician (69% vs 80%) or third encounter (66% vs 73%).[76]

4. Medical Expenditure Panel Survey:

To demonstrate that complementary and alternative (CAM) medical services (of which chiropractic is a portion), an analysis of the Medical Expenditure Panel Survey of 12,036 adults 17 years of age and older from 2002-2008 was undertaken. Sources of data included private insurance, Medicare, Medicaid, and out-of-pocket expenditures. Cost-generating services included (a) outpatient visits, (b) inpatient hospital stays, (c) ER visits, and (d) medication prescriptions, while cost exclusions comprised (a) over-the-counter medications, (b) free-standing radiology clinics, (c) medical supplies and

equipment, and (d) dental services. The weighted sample of 4,306 CAM users compared to non-CAM users revealed:

a. Significantly better self-reported health, education, and comorbidity;
b. Lower annual adjusted medical costs by $424.
c. Lower annual adjusted total healthcare costs by $796.
d. Lower inpatient expenditures.

The most conservative conclusion was that CAM expenditures did not add to national spending, using a large sample of patients with back and neck problems. What was significant in this particular study was that it was the first survey of its kind to evaluate a nationally representative sample, controlled for socioeconomic and health-related variables. A propensity scoring method accounted for biases attributed to selection.[77]

E. Steps taken to control escalating costs with greater emphasis upon conservative care:

A number of studies that identify factors leading to costly spinal surgery and how these might be bypassed have been provided:

1. An Early Risk Identification Study Cohort examined early predictors of lumbar spine surgery within 3 years among Washington State workers with new workers' compensation temporary total disability claims for back injuries. The results of 1,885 workers showed that 42.7% of workers who saw a surgeon first had surgery, but just 1.5% of those who first consulted a chiropractor had surgery. The breadth of this margin suggests that simply having chiropractors as first contact providers could produce major cost savings without a sacrifice on health.[78]

2. A managed care organization in Michigan required that all spine patients who were heading for nonurgent surgical consultation first have one session with a physiatrist. After this policy was implemented, there was a 48% decrease in surgical referrals, a 25% reduction of spine operations, and a 25.1% drop in surgical costs.[79]
3. The University of Pittsburgh Medical Center Health Plan, recognizing back pain as the third most costly health condition treated as mentioned earlier, five years ago started educating doctors about using less medication, imaging, and surgery while increasing referral rates to D.C.s and P.T.s. Because this initiative did not show a significant impact, the Health Plan subsequently *mandated* that patients with chronic back pain had to undergo a minimum of 3 months of chiropractic and/or physical therapy before any spine surgery is approved.[80]

An additional demonstration of cost savings in healthcare at the workplace was shown by an on-site chiropractic program implemented at a large meat plant in Manitoba, Canada. It involved the early detection, treatment, prevention, and occupational management of musculoskeletal injuries two days each week including advice on

ergonomic issues, job rotation, modified duties and return to work, stretching programs, and back school during the period April 2003-December 2006. During that period:

1. The days of lost time in the aggregate decreased from an average of 235.6 days/month to 134.6 days/month.
2. According the Workmens Compensation Board, costs decreased:
    a. 2003: $1174
    b. 2004: $ 797.
    c. 2005: $ 481.
    d. 2006: $ 677.
3. $900,000 was saved in the costs of surgeries averted during the 21 months that the program was in existence.
4. The foregoing data are all the more remarkable in that the actual frequency of injuries *increased*.[81]

F. Conclusions:

Pran Manga, an economist at the University of Ottawa, has been twice commissioned by the Provincial Government of Ontario to assess the effectiveness and cost-effectiveness of chiropractic management of low-back pain. His assessment of the comparative cost data in his first report led him to conclude that:

> "There is an overwhelming body of evidence indicating that chiropractic management of low- back pain is more cost-effective than medical management. We reviewed numerous studies that range from very persuasive to convincing in support of this conclusion. The lack of any convincing argument or evidence to the contrary must be noted and is significant to us in forming our conclusions and recommendations."[82]

The cost advantages for chiropractic for matched conditions appear to be so dramatic that Manga, in his second report, concluded that **doubling the utilization of chiropractic services from 10% to 20% may realize savings as much as $770 million in direct costs and $3.8 billion in indirect costs.** Four out of five patients of chiropractors have endured their problems for more than 6 months, typically undergoing medical care and/or physiotherapy before even reaching their chiropractor.[83]

A second economist, ML Baldwin, offers a qualified concurring opinion: "The research consistently shows that chiropractic patients have shorter durations of work absence, on average, than physician patients."[45]
There are five basic conclusions that can be harvested from this report:

1. America's healthcare system is the most expensive in the world without the ranking to show for it.

2. The major cost drivers of America's healthcare system are;

a. Prescription medications..
b. Surgeries.
c. Administration.

3. A guide as to how to more accurately dissect both direct and indirect healthcare costs in studies has been provided. No cost-effectiveness studies have captured all of these, although some are more inclusive than others.

4. A variety of cost comparisons within the insurance industry, managed care organizations, Medicare, and perhaps the Medical Expenditures Panel Survey suggest substantial cost savings when chiropractic services are substituted for medical services. The outcomes in such a substitution are anticipated to be at least as favorable if not better.

5. Workers Compensation studies in particular reflect an exclusion of chiropractic services that can best be described as an anomaly, if not egregious.

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