

## **Complementary and Alternative Medicine in Back Pain Utilization Report**

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**Prepared by:**

McMaster University Evidence-based Practice Center  
Hamilton, Ontario, Canada

**EPC Director:**

Parminder Raina, Ph.D.

**Principal Investigators:**

P. Lina Santaguída, B.Sc.PT., Ph.D.  
Anita Gross, B.Sc.PT., M.Sc. (Clin Epi)

**Authors:**

P. Lina Santaguída, B.Sc.PT., Ph.D.  
Anita Gross, B.Sc.PT., M.Sc. (Clin. Epi.)  
Jason Busse, D.C., Ph.D.  
Joel Gagnier, B.A., N.D., Ph.D.  
Kathryn Walker, B.Sc, B.Ph.E, M.Sc.P.T.  
Mohit Bhandari, M.D. M.Sc. F.F.C.S.C.  
Parminder Raina, B.Sc., Ph.D.

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## Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-Based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of healthcare in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new health care technologies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

To bring the broadest range of experts into the development of evidence reports and health technology assessments, AHRQ encourages the EPCs to form partnerships and enter into collaborations with other medical and research organizations. The EPCs work with these partner organizations to ensure that the evidence reports and technology assessments they produce will become building blocks for health care quality improvement projects throughout the Nation. The reports undergo peer review prior to their release.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers as well as the healthcare system as a whole by providing important information to help improve health care quality.

We welcome comments on this evidence report. They may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by e-mail to [epc@ahrq.gov](mailto:epc@ahrq.gov).

Carolyn M. Clancy, M.D.  
Director  
Agency for Healthcare Research and Quality

Beth A. Collins Sharp, R.N., Ph.D.  
Director, EPC Program  
Agency for Healthcare Research and Quality

Jean Slutsky, P.A., M.S.P.H.  
Director, Center for Outcomes and Evidence  
Agency for Healthcare Research and Quality

Margaret Coopey, R.N., M.G.A., M.P.S.  
Task Order Officer, EPC Program  
Agency for Healthcare Research and Quality

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## Structured Abstract

**Objectives:** This systematic review was undertaken to evaluate which complementary and alternative medicine (CAM) therapies are being used for persons with back pain in the United States.

**Data Sources:** MEDLINE<sup>®</sup>, EMBASE<sup>®</sup>, CINAHL<sup>®</sup> and Cochrane Central<sup>®</sup> and a variety of CAM specific databases were searched from 1990 to November 2007. A grey literature search was also undertaken, particularly for clinical practice guidelines (CPG) related to CAM.

**Review Methods:** Standard systematic review methodology was employed. Eligibility criteria included English studies of adults with back pain, and a predefined list of CAM therapies.

**Results:** A total of 103 publications were evaluated; of these 29 did not present CAM therapy use stratified for back pain. There were a total of 65 utilization studies, 43 of which were American. Four publications evaluated the concurrent use of four or more CAM therapies and these suggest that chiropractic/manipulation is the most frequently used modality followed by massage and acupuncture. A limited number of publications evaluated utilization rates within multiple regions of the back and show that CAM was used least for treating the thoracic spine and most for the low back. However, rates of use of massage were similar for neck and lower back regions. Concurrent use of different CAM or conventional therapies was not well reported.

From 11 eligible CPG, only one (for electro-acupuncture) provided recommendations for frequency of use for low back pain of all acuity levels.

Eighteen cost publications were reviewed and all but one publication (cost-effectiveness) were cost identification studies. There is limited information on the impact of insurance coverage on costs and utilization specific to back pain.

**Conclusions:** There are few studies evaluating the relative utilization of various CAM therapies for back pain. For those studies evaluating utilization of individual CAM therapies, the specific characteristics of the therapy, the providers, and the clinical presentation of the back pain patients were not adequately detailed; nor was the overlap with other CAM or conventional treatments.



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**Appendixes and Evidence Tables for this report are provided electronically at**  
<http://www.ahrq.gov/downloads/pub/evidence/pdf/backpaincam/backcam.pdf>.

# Executive Summary

## Introduction

The high prevalence rates for neck, thoracic, and low back pain, indicate the importance of this health problem as a public health concern. Back related pain has a high morbidity and cost burden in the United States (U.S.) and other industrialized countries.<sup>1-4</sup> Treatment for this pain can be multidimensional and include conventional care, complementary and alternative medicines (CAM), or both. CAM is comprised of a group of therapies that are considered to be outside the scope of treatment of most conventional practitioners or therapies. The large constellation of treatment modalities that constitute CAM are used widely throughout the U.S. and internationally, both by individuals who are healthy and those who have specific health concerns such as back pain.<sup>5,6</sup> Use of CAM therapies can include visits to specific practitioners, as well as self-treatment (for example, when using herbal products, or relaxation techniques).

## Scope and Purposes of This Systematic Review

What CAM therapies are being used for treatment of persons with back pain in the United States? (overarching question)

- 1) What is the relative utilization for the different CAM therapies?
  - i. Does the utilization differ by where the back pain is anatomically located (i.e., neck, mid-back, low back)?
  - ii. Which therapies are used as complementary to conventional care and which are used as alternative?
  - iii. When more than one therapy is used for back pain, how are these combined?
- 2) What is the utilization that is recommended by different types of healthcare providers?
  - i. How do these recommendations compare to the actual utilization reported in studies from question one?
  - ii. How do the recommended and actual utilization reported differ by CAM practitioner type?
- 3) What are usual costs for these therapies per treatment and for the prescribed course of treatments?
  - i. How much of this cost is covered by insurance or included in health plans?

## Methods

### Analytic Framework

When considering the use of health services, the traditional understanding of utilization is a visit to a CAM provider or service. However, CAM includes the use of products and practices that may not be directed by a CAM provider. As such we adopted the model by Foubadbakhsh and Stommel<sup>7</sup> as our analytic framework. This model, adapted specifically for CAM from

Andersen's behavioral model of healthcare utilization,<sup>8</sup> goes beyond provider directed service provision and incorporates CAM resources such as nutritional supplements and self-directed CAM practices such as meditation.

## **Searching and Eligibility Criteria**

Standard systematic review methodology was employed. Traditional bibliographic databases, CAM specific databases and grey literature sources were searched from 1990 to November 2007. The traditional medical and allied health databases searched included; Medline<sup>®</sup>; CINAHL<sup>®</sup>; PsychINFO; EMBASE<sup>®</sup>, and Cochrane Central Register of Controlled Trials<sup>®</sup>. Alternative therapy bibliographic databases included: AMED; Index to Chiropractic Literature (ILC); National Library of Health: Complementary and Alternative Medicine Specialist Library; Acubriefs; Bandoliers CAM database; Mantis; Micromedex; Agricola; and HOM-INFORM.

Eligible studies were limited to those published in English and from 1990 forward. National U.S. population based surveys that probed CAM utilization were searched from 1970 to November 2007. Although our focus was on U.S. utilization of CAM, studies undertaken in Canada, the United Kingdom, Europe, Australia, and New Zealand were also eligible and compared to American patterns of use.

Studies were included if they presented information on the utilization of CAM therapies, CAM practitioners, or costs associated with CAM service use in adults with back pain in the neck, thorax, or lumbar regions. Self-administered home remedies were also included. The use of medical injections, prescription drugs, and back surgery were excluded as were mechanical traction, a variety of exercise techniques, patient education, cognitive behavioral therapy, deep brain therapy and orthoses. There were no restrictions for primary study designs. Clinical practice guidelines (CPG) were eligible if they focused on back pain and CAM use within the U.S.. Similarly, studies evaluating costs for CAM use in the United States for back pain were included.

## **Results**

From an initial 8,323 unique citations, 6,667 were excluded during title and abstract screening. The full text publications of 239 citations were retrieved and 95 of these were excluded as they did not address utilization or costs associated with the use of CAM; 103 publications were eligible for data extraction. We identified 19 CPG and 8 were excluded as there were no recommendations for optimal utilization. There were 22 publications on providers views about CAM and of these 16 were excluded as they did not focus on use. There were 18 studies evaluating the use of CAM therapies and cost outcomes relating to the use of CAM for back pain.

### **Question 1: What is the Relative Utilization for the Different CAM Therapies?**

From 103 citations, 85 were unique to utilization and nine overlapped (total 94) with the cost papers; of these, 29 publications had limited information on utilization as the data were not stratified for persons with back pain. Of the remaining 65 publications, 43 were from the U.S.

and 22 from other eligible countries. For the purposes of this executive summary we have limited our presentation to U.S utilization patterns and trends.

## **Relative Use of CAM Therapies in Persons With Back Pain**

We identified those publications that presented the relative use of CAM therapies in order to rank them from the most to least frequently utilized by persons with back pain. We did not select studies where subjects were recruited from the practices of CAM providers, as this would not reflect relative utilization but would reflect practice patterns with respect to combining differing CAM therapies. Four U.S. studies<sup>9-12</sup> reported utilization data for a minimum of four different CAM therapies or practitioners. All but one<sup>9</sup> measured lifetime use of CAM and all subjects had chronic or recurrent back pain. Chiropractor or “chiropractic” was the CAM therapy that was most frequently used by patients with chronic low back or combined neck and back pain in three publications.<sup>10-12</sup> In one publication<sup>9</sup> massage was the most frequently used CAM therapy; massage also ranked as the second mostly frequently used therapy in the other publications. Acupuncture was the third most frequently used therapy. When reported, other frequently used modalities were prayer and spirituality and glucosamine.

Given the limited number of studies that evaluated relative CAM utilization, we explored patterns for those individual therapies shown to be frequently used by persons with back pain.

## **Chiropractic/Spinal Manipulation**

Thirty-six publications<sup>9-44</sup> on chiropractic/spinal manipulation, were undertaken in the U.S. The majority (n = 24) reported on low back pain (LBP) and the fewest on neck (n = 3) and thoracic spine (n = 1). Our review suggests that chiropractic care/spinal manipulation is commonly sought by patients with back pain. In the 10 cross-sectional studies<sup>9,12-14,18,19,26,29,31,35</sup> based predominately on random or systematic samples, rates of utilization varied from 16<sup>14</sup> to 45 percent.<sup>18</sup> Eligible U.S. trials on LBP populations found that rates of attending for chiropractic/spinal manipulative therapy range from 10 to 47 percent.<sup>9,11,18,19,28,30,32,35,41</sup> The number of visits for chiropractic care or other providers of spinal manipulative therapy varied from a mean of 4.3 to 15.7.<sup>9,19,22-24,28,33</sup> Between 79 and 94 percent of treatment by chiropractors included spinal manipulative therapy.<sup>9,11,22,23,28,33,37</sup> Three studies provided some evidence for a gradient of use based on anatomical regions; thoracic pain was treated least often,<sup>40</sup> followed by the neck, with the low back being the most commonly treated.<sup>25,40,44</sup>

Chiropractors were the providers of spinal manipulative therapy in most publications (n = 34), and physiotherapists in two publications.<sup>30,35</sup> Details on the type of spinal manipulation was provided in three only publications.<sup>15,24,33</sup> The available information suggests that roughly equal proportions of LBP patients use chiropractic as complementary to conventional care and as an alternate. Current literature provides little insight into the manner in which chiropractic/spinal manipulation is combined with other therapies for back pain. Despite the common use of chiropractic/spinal manipulation by patients with back pain the current literature provides limited data on utilization.

## Massage

Twelve U.S. publications<sup>9,11,12,15,16,18,20,22,23,30,33,44</sup> evaluated the use of massage in persons with back pain. The majority of populations were from specialized clinical practices or from the practices of licensed CAM providers. Two publications<sup>16,20</sup> using data from large health claims databases showed low rates of massage utilization for LBP, varying from 4 to 5 percent of the total sample. One study recruiting from a population based sample<sup>12</sup> reported a massage utilization rate of 14.1 (95 percent CI, 10.8-17.4) for patients with combined neck and back pain. Publications that evaluated use of massage in smaller samples, showed rates of use varying from 17 to 52 percent. The timeframe of reported use was one year, with the exception of two studies evaluating lifetime use.<sup>11,18</sup> The majority of studies reported on LBP (n = 9) and mostly for chronic pain; one study<sup>44</sup> reported on utilization of massage for neck pain. Only one publication<sup>15</sup> provided any detail as to the type of massage administered, the provider, and use with other CAM therapies, or with conventional care.

## Acupuncture

Eight publications<sup>10-12,15,16,18,44,45</sup> evaluated the use of acupuncture in persons with back pain and all but one used self-report methods.<sup>16</sup> Two of these studies<sup>12,45</sup> were based on randomly selected general population samples and, as expected, these showed markedly lower rates of utilization for both neck and unspecified back (1 to 4 percent) and combined neck and back pain (1 percent). Similar rates of utilization were observed (1 percent) in a study evaluating a large administrative database.<sup>16</sup> All other studies based primarily on subjects from clinical practices or with back pain showed higher rates of utilization (7 to 36 percent). Rates of use also varied by the timeframe for recall (12 months to lifetime prevalence), interval of analysis for administrative databases, and recruitment of subjects from clinical practices.

The majority of publications evaluated LBP or unspecified pain, with utilization for neck or combined neck and back problems being less commonly assessed. No clear pattern emerges for utilization rates as a function of the anatomical back region. One publication<sup>44</sup> reported no difference in the relative frequency of CAM use for neck and back but another<sup>45</sup> showed lower rates of use for persons with neck (14 percent) relative to back pain (34 percent). In part this may be due to the limited number of studies, but it may also be related to the lower prevalence of neck pain relative to LBP. Only one publication,<sup>15</sup> provided any detail as to the specific type of acupuncture, the provider, the overlap with other CAM therapies, or with conventional care.

## Question 2: What is the Utilization Recommended by Different Types of Healthcare Providers?

From 11 eligible CPG only one<sup>46</sup> made specific utilization recommendations for acute, subacute, chronic and recurrent back patient groups. The recommended frequency from this CPG<sup>46</sup> for electro-acupuncture was for 2 to 3 times weekly for a duration of 4 weeks (acute and subacute) and 6 to 8 weeks (chronic and recurrent/flare-up). The recommendations were not specific to neck or back problems, and therefore applied to both of these locations. Although very similar in its recommendations, this guideline distinguishes between utilization with respect

to an initial and a continuing course of treatment. The CPG recommends re-evaluation after 12 weeks of treatment irrespective of the acuity of the condition.

Six studies<sup>47-52</sup> presented information on provider views on utilization, but none specified details with regards to the frequency or duration of treatment. These publications suggest that the frequency of utilization may be influenced by provider organization policies, insurance coverage, access or availability of CAM services, attitudes of the practitioner, and a public versus private practice setting.<sup>52</sup>

### **Question 3: What are the Usual Costs for These Therapies per Treatment and for the Prescribed Course of Treatments?**

Our review identified 18 publications that were associated with costs or economic evaluations related to the use of CAM for back pain in the US. The majority of publications (n = 13) focused on costs associated with CAM services for LBP;<sup>16,20,32,37,39,53-60</sup> the remaining studies evaluated unspecified<sup>34,36</sup> and combined neck and back pain.<sup>61</sup> Fifteen of the publications were not true economic analyses, but rather cost identification studies. A single study<sup>57</sup> undertook a complete cost-effectiveness analysis (CEA) from the perspective of the payer.

The majority of publications (n = 13) evaluated chiropractors as the CAM provider.<sup>20,32,34,36,37,39,53-55,57-59,61</sup> The conventional providers to which they were compared included medical doctors (M.D.s) (n = 11)<sup>16,20,32,34,36,37,53,54,56,59,60</sup> or orthopedic surgeons or internists.<sup>53,54</sup> The source of payment for the CAM therapies in these studies included private health insurance (n = 5),<sup>16,32,34,59,61</sup> workers' compensation insurance (n = 4),<sup>36,37,39,60</sup> and mixed sources including out of pocket (n = 4).<sup>20,53,54,57</sup> The three randomized controlled trials<sup>55,56,58</sup> had the study or the participants insurance pay for treatments.

All studies included costs of visits to practitioners, but varied with respect to: a) inclusion of imaging or diagnostic tests, b) visits to specialists, c) back surgery costs, and d) the use of medications. For studies with workers' compensation insurance as the payer, some included costs for lost days<sup>36,60</sup> while the others excluded these.<sup>37,39</sup> There was no clear trend of relative increase or decrease in costs associated with CAM versus conventional services; interpretation across studies is problematic given the differences in items included within the total costs, and the timeframe for which these were estimated. The only study providing a CEA suggested that chiropractic care was cost-effective for chronic pain patients, but variable for acute pain.

Three publications<sup>20,53,57</sup> were based on samples entirely covered by insurance from private health organizations or workers' compensation. These studies suggest that a greater portion of patients seeking chiropractic care had no insurance coverage than those seeking care from an M.D.

## **Discussion**

In this systematic review we addressed a series of broad questions related to the utilization of CAM therapies in persons with back pain. Unlike previous reviews,<sup>62</sup> we found that the majority of studies did differentiate the various types of CAM with respect to use. However, approximately one-third of the literature on patterns of use did not report outcomes stratified for those with back pain.

Our systematic review identifies the need for more research to evaluate the relative utilization and trends over time of CAM use specific to persons with back pain. Differentiating

patterns of relative use for acute versus chronic/recurrent back pain and the degree to which different CAM therapies are sought would assist in understanding patterns of use within these populations.

In general, our findings on utilization of CAM in persons with back pain, highlight the need for high quality prospective observational studies to establish utilization data by location of complaint, the specific type of CAM therapy linked to specific providers, the degree to which the care is used as complementary or alternative to conventional care, and the degree to which different CAM therapies are combined for an episode of care. The widely varying rates of use are related to number of factors including: the type of sample recruited (i.e., large national sample or smaller practice based sample), the timeframe for recall (i.e., four weeks versus lifetime use), the anatomical region, and the method used to measure utilization. The majority of studies reported on contact utilization (ever using the service or provider) rather than volume utilization (the frequency and duration of visits). The majority of studies also reported on use for the low back and did not evaluate the effects of the duration of the back pain (acute versus chronic) in regards to the reported use of CAM.

Our evaluation of U.S. CPG showed very limited information on the recommended use of CAM therapies with only a single guideline providing utilization recommendations. A significant gap with regards to recommended utilization for persons with back pain of differing duration and anatomical region has been identified. In part, this lack of recommendations on CAM utilization for back pain may reflect the lack of high quality evidence from randomized trials focusing on the optimal dosage for treatment benefit.

The majority of studies reporting cost outcomes for the use of CAM therapies were cost identification analyses and not true economic analyses; the single study that undertook a formal CEA showed benefit of chiropractic for chronic LBP alone. More research is required to link costs of CAM therapies to outcomes of benefit and harm.

As more “conventional practitioners” choose to use CAM therapies in their “conventional” practices, the distinction between alternative and traditional is becoming blurred. Future studies should endeavor to specify operational definitions for alternative and conventional therapies and providers.

## **Conclusions**

Although we evaluated a large number of studies (74 that stratified data) on utilization and costs in persons with back pain using CAM therapies, there were significant limitations in understanding the patterns of use across studies. In part the variation and inconsistencies across studies may be attributable to lack of consensus on reporting in utilization and other health services studies; future research to establish these criteria will contribute to evaluation of use.

Our systematic review demonstrates that CAM therapies are frequently used by persons with back pain. Our findings would support the following conclusions and recommendations for future research in this area:

### **Population**

- 1) Many studies provided minimal information about the characteristics of the sample. In particular, most reports on utilization of CAM therapies do not specify an operational definition for back pain with respect to the anatomical location, or the duration of pain. We recommend that future studies adequately detail the study subjects under

investigation and explicitly detail the location of the back pain and its duration (acute or chronic).

- 2) Low back was the most frequently evaluated anatomical region. Fewer studies evaluated the use of CAM for neck and thorax. Although, we recognize that the prevalence of back problems is lower in these regions, our review did not find sufficient evidence to support the differential use of CAM therapies as a function of location. We recommend that future utilization studies of CAM use for back pain address any potential differential use of therapies as a function of anatomical location. We also recommend capture of use of CAM therapies for multiple back regions being treated within or across episodes of care, since some CAM therapies treat regions distant from the low back as part of their theoretical model of back pain care.

### **Intervention**

- 3) CAM therapies were frequently identified as broad categories, with little specification of the type of modality used. Similarly, the providers of the therapies were very poorly detailed or were not linked to the therapies received. We recommend that future studies adequately detail the specific type of CAM therapy, and link this to the providers of the therapy.
- 4) There were few studies that evaluated the use of CAM therapies relative to each other for back pain. The available studies would suggest that chiropractic/manipulation is the most frequently used modality followed by massage and acupuncture. We recommend that future studies evaluating relative use of CAM include a comprehensive list of CAM therapies and provide details in this regard. We recommend that this use be linked to all providers of the therapy. We also recommend that use with other CAM therapies is differentiated with respect to current and past episodes of back pain.

### **Comparator**

- 5) Concurrent use of different CAM or conventional therapies was not well reported. A significant gap in the literature has been identified. We recommend that future studies detail the level of concurrent use of other CAM or conventional therapies with respect to current or past episodes of care, location of back pain, and the provider of the therapy.
- 6) Our review would suggest that there was inconsistency with regards to the types of therapies and providers considered conventional or alternative. We recommend that future studies explicitly detail the nature of the therapies linked to specific providers rather than relying on labels of conventional or alternative therapies or providers.

### **Outcomes**

- 7) Utilization of CAM services is generally presented as a dichotomous outcome (use or non-use); less information is available with regards to frequency, duration and type of service provision for an episode of care. We would recommend that future research probe frequency and duration of use (preferably in more than one time interval), associated with both the CAM therapy and the provider of the therapy. We also recommend that the “episode of care” being evaluated be explicitly defined.
- 8) The primary source of information on utilization of CAM therapies for back pain comes from self-report within questionnaires and from retrospective administrative healthcare analyses. We recommend that explicit details of the survey or interview questions are provided including the operational definitions of the CAM therapies and the categories of providers. Similarly, we recommend that explicit definitions for the type of back



pain, the provider types, and the therapy received are provided for studies using administrative databases.

- 9) The studies reporting cost outcomes are primarily cost identification in nature rather than true economic analyses. The perspective was primarily that of the payer and as such, only direct costs were evaluated. We recommend that future evaluation of costs include details about indirect costs, consider the costs from a societal perspective, and use formal economic analyses that consider the benefits and harms associated with intensity of use.

**Other**

- 10) A single CPG reported on frequency of use as a function of LBP duration. The majority of U.S. CPG guidelines on CAM therapies did not report utilization or recommend parameters for optimal use. A significant gap in the literature has been identified. We recommend that future guideline development attempt to address this gap for CAM therapies as a function of back region and duration; guideline developers should indicate when these recommendations are based on evidence and when they reflect best practice.
- 11) Few studies were found that reported provider views on recommendations for the optimal utilization of CAM therapies for back pain. Providers' philosophies of care and healthcare setting constraints may affect patterns of use. We recommend that future studies explore issues in provider and possibly patient views about the frequency and duration of utilization. We recommend that these views be explored in the context of specific subgroups of back patients based on location and duration, different providers of the same CAM therapy, and conventional providers' views of their own interventions and those of CAM providers.

# **Evidence Report**



# <sup>1</sup>Chapter 1. Introduction

## Background

The high prevalence rates for neck, thoracic, and low back pain (LBP), indicate the importance of this type of musculoskeletal pain as a public health concern. Back pain can occur at any age, and is usually recurrent, with subsequent episodes tending to increase in severity;<sup>2,3,63,64</sup> this speaks to back pain as an important source of chronic illness in adults. Although, the majority of back pain episodes resolve within a 6 week period, there is a portion of persons with back pain that have significant disability, resulting in loss of working abilities, restriction of daily activities, and a decline in quality of life.<sup>2,3,65,66</sup> Back pain, although most frequently evaluated in adults, is not limited to this population. Even in adolescents suffering from back pain, a significant proportion (up to 40 percent) will have recurrent episodes of sufficient severity to limit usual activities, including participation in sports.<sup>67</sup> In general, prevalence rates for back pain are lower in younger adults relative to middle aged adults, and have not been well evaluated in elderly subjects.<sup>68</sup>

Back related pain has a high morbidity burden in adults in the United States (U.S.) and other industrialized countries.<sup>1-3</sup> The 3 month prevalence of neck and back pain within the U.S. adult population is 31 percent;<sup>64</sup> 34 million with LBP, 9 million with neck pain, and 19 million with both.

A recent review<sup>4</sup> of the costs associated with back pain indicates that it ranked 6th in U.S. national health costs, and as the 4th most expensive health cost for U.S. employers. Additionally, a study using the human capital approach to evaluate indirect costs for back pain, estimated these to be \$19.8 billion; higher than those of headache (\$19.6 billion), arthritis (\$10.3 billion), and other pain conditions (\$11.6 billion) considered in the survey.<sup>66</sup> In 1995 and 1996 the estimated cost of chronic pain (including lost work days, therapy and disability) was \$150 billion to \$215 billion USD each year.<sup>69</sup> This trend of high costs has been observed in other industrialized countries. One cost evaluation undertaken in Sweden demonstrated that the annual total cost for back and neck problems is equivalent to one percent of the gross national product, with the majority of costs due to indirect care and longterm disability.<sup>70</sup>

Treatment approaches for back related pain can be multidimensional and include conventional care, complementary and alternative medicines (CAM), or both. The combined use of conventional and CAM therapies is known as “complementary” therapy; when this combined care is based on high quality evidence of efficacy and safety is known as “integrative care”. The large constellation of treatment modalities that constitute CAM are used widely throughout the U.S. and internationally both by individuals who are healthy and those who have specific health concerns such as back pain.<sup>5,6</sup> The use of CAM therapies can include visits to specific practitioners, as well as self-treatment (i.e., when using herbal products, or relaxation techniques). In the literature, CAM therapies are inconsistently defined and this may be an important factor in variation in reported prevalence rates.<sup>62</sup>

In the U.S., there is some evidence to suggest that those suffering from chronic pain are more likely to use CAM therapies or CAM practitioners services, than those without chronic pain.<sup>5,71</sup> One of the main reasons that patients seek CAM therapies is for back and neck pain.<sup>6,12,71</sup> One

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Appendixes and evidence tables cited in this report are provided electronically at:  
<http://www.ahrq.gov/downloads/pub/evidence/pdf/backpaincam/backcam.pdf>

estimate indicates that the adjusted odds ratio predicting use of CAM services is equal to 2.30 (95% CI 1.66 - 3.20) for those with back pain; the only other condition to exceed this value was anxiety.<sup>71</sup> Moreover, Americans who reported having back pain were more likely to see a CAM practitioner (or self-use CAM) compared to the entire population sampled.<sup>5,71</sup>

## **What is CAM?**

Given the preference of many persons with back pain to use CAM therapies or CAM practitioner services in the management of their problem, a better understanding of what constitutes CAM therapies is important. CAM is comprised of a group of therapies that are considered to be outside the scope of treatment of most conventional practitioners or therapies. The number of therapies and practitioners classified as CAM, can vary depending on the country, but a recent classification scheme has been established within the U.S.<sup>72,73</sup> These CAM therapies represent diverse health system approaches, health practices, and products that are not presently considered to be conventional.<sup>73</sup> Conventional medicine in the U.S. is practiced by medical doctors, osteopathic doctors, physical therapists, psychologists and registered nurses.<sup>73</sup> However, osteopathic physicians do practice osteopathic manipulative therapy which can also be considered CAM in nature. This raises the issue that an increasing number of conventional practitioners are including what have been traditionally categorized as CAM therapies in their current clinical practice. There is some confusion as to whether the practitioner or the therapy should be the basis upon which the treatment is classified as alternative or complementary or conventional. This confusion presents some challenges to understanding utilization of these therapies.

As some of these CAM therapies develop an evidence base and are adopted into the conventional healthcare system as treatment options, the distinction of being CAM may change.<sup>73</sup> This may present some ambiguity when considering comparisons between alternative and conventional care; consider the case where 100 percent of the population uses the “alternative” therapy, and as such the therapy then becomes conventional.<sup>74</sup> The World Health Organization has defined CAM as “a broad set of health practices that are not part of a country’s own tradition, or not integrated into its dominant health care system”.<sup>75</sup> As such the definition of what is alternative or complementary may vary by country.

The National Center for Complementary and Alternative Medicine (NCCAM)<sup>73</sup> classifies most CAM therapies into five domains as follows: 1) manual or mobilization therapies including manipulation and body movement therapies; 2) mind body medicines that include behavioral, psychosocial, and spiritual approaches; 3) chemical or biological based therapies that include the use of natural and biologically based products; 4) energy therapies that use differing methods to alter energy fields around the body; 5) holistic approaches that have an underlying theoretical framework for evaluating and promoting health such as Traditional Chinese Medicine, Homeopathy, and Chiropractic; and finally 6) “home remedies” that can include variants of all the therapies listed previously. From a health services perspective, this latter category is often not clearly identified as CAM therapy.<sup>62</sup> There is no consensus regarding the classification of these various CAM therapies within the larger domains. However, from a health services research perspective, there is a need to specify the therapies used rather than identify broadly the CAM domains.<sup>62</sup> There may also be a need to distinguish the “therapist” from the “therapy”. Establishing that a “naturopath” provided a specific type of care such as acupuncture is

important; the dose or subtype of therapy may differ between practitioners. Whether the public distinguishes between the therapist and the therapy is not always clear.

## **Who Uses CAM?**

Historically CAM approaches to health care were marginalized by the medical profession in the U.S. A review of population surveys within industrialized countries suggested that CAM users were predominately female, with higher education and socio-economic status, and of white race.<sup>62</sup> This is consistent with patterns of use within the U.S.<sup>71,76</sup> A bimodal distribution with regards to use of CAM related to low socio-economic status and ethnicity has also been shown; ethnic minorities, who are generally underrepresented in surveys, typically use CAM on a regular basis.<sup>77</sup>

In the early 1990's survey data suggested that respondents did not use CAM for serious medical conditions (denoted as "principle medical conditions"); rather they used it primarily for health promotion and disease prevention.<sup>5,78</sup> Amongst the aging American baby boomers, there is increasing awareness that health is not only the "absence of disease", but incorporates the concepts of wellness and lifestyle.<sup>79</sup> This is creating a trend towards the increased use of CAM which is anticipated to continue, as these therapies are used to promote health and prevent disease in those who are well. In those who are ill, CAM is used to manage and treat specific health problems.

American attitudes towards CAM therapies have changed in part due to greater media coverage and access to web-based information about specific therapies. Interestingly, chronic back pain patients from urban settings were shown to be willing to try CAM therapies, despite indicating that they knew little about the therapy (with the exception of chiropractic and massage); moreover, no relationship was shown between high expectations for a particular therapy and previous use or knowledge of the therapy.<sup>18</sup> In the case of chronic back pain, where conventional or allopathic treatments have had limited success, patients are more open to trying CAM therapies. The appeal of many CAM therapies may be due to dissatisfaction with traditional conventional medical therapies that may be perceived as more invasive or less effective such as back surgery versus manipulation. For some, the appeal of some CAM therapies is that they are perceived as emphasizing personal autonomy over one's own health. All of these factors have generated greater interest in using CAM therapies, which in turn has resulted in greater CAM availability within conventional health care facilities and places of employment, availability of CAM courses in conventional health professional training centers, and changes in reimbursement in health insurance coverage.

## **What is CAM use and What are the Behavioral Models Explaining This use?**

Health service utilization is a broad term that generally refers to the use of a health provider or health service and is generally understood to indicate a visit to a provider or a health service.<sup>8,80</sup> This concept of use has been expanded to include the use of CAM therapies that may or may not be directed by a practitioner, such as the use of supplements or other CAM therapies within the home.<sup>7</sup> A number of outcomes have been used, predominately from survey-based data, to explore the use of CAM including prevalence rates, costs, patterns of use, changes in use over time, reasons for CAM use, attitudes associated with CAM use, and comparisons of users

with non-users.<sup>81</sup> However, a distinction should be made between outcomes that indicate obtaining a CAM therapy or service and factors that explain why someone chooses to use a CAM therapy or to access a CAM practitioner.

The use of health care services has often been explained by the physical, psychological and social characteristics of the users, the healthcare system, and the providers within the system. The Andersen model of health service utilization (and adapted versions) describes patterns and identifies predictors of use.<sup>8,82</sup> This behavioral model for the use of health services, is a multi-disciplinary attempt to integrate economic, healthcare-related, socio-cultural, and psychological factors. The model assumes that there is a sequential relationship between three sets of determinants of use: 1) the predisposition to use services (predisposing); 2) the ability to obtain services (enabling); and, 3) perceived (patient) or evaluated (medical) need. The predisposing component relates to demographic, socio-structural, and attitudinal-belief variables, irrespective of the underlying condition. The enabling component includes both family and community resource variables that are required to seek and obtain care. The need component involves an individual's perception of illness and the limitations that it imposes on daily activity. Health beliefs are attitudes, values and knowledge that people have about health and health services that might influence subsequent perceptions of need and use. Health beliefs in particular can influence use of services in relation to preventative health behaviors. Perceived need by the user may explain care seeking behaviors and adherence to care. Evaluated need as determined by the provider can assist in understanding the type and amount of treatment used.

The Andersen model of healthcare utilization has been expanded to include environmental variables.<sup>8</sup> This would include characteristics of the healthcare delivery system such as policies, resources, organization and financial arrangements influencing accessibility, availability, and acceptability of the health services. External environmental factors include the economic climate, relative wealth, politics, level of stress and violence, and prevailing norms of the society. Finally, the community level environmental variables can include attributes of the community where one lives that enable them to obtain service (availability of practitioners).

While the Andersen model of healthcare utilization assumes that use necessarily entails a visit to a healthcare provider or health service, Fouladbakhsh and Stommel<sup>7</sup> have proposed an alternative categorization of CAM therapies and activities and in turn a new model for conceptualizing health service use. Their model not only includes the CAM provider, but also "use" with regards to "products and resources" (i.e., the use of herbs, supplements, self-help manuals, etc.) and CAM practices (individual or communal direction of therapy). The developers of this new model argue that these expanded categories can be integrated with the Andersen model and serve to enhance the framework to improve prediction of CAM use. The new model, adapted specifically for CAM still includes predisposing, enabling, and need factors to explain healthcare use. It also allows for evaluation of the concurrent use of conventional health services.

## **Evaluating the Methodological Quality of Studies Addressing Utilization of CAM**

Much of the literature evaluating utilization of CAM services is collected from patient or practitioner recall surveys, chart review, or analysis of administrative health claim databases.<sup>83</sup> Moreover, many studies evaluating utilization employ observational designs without a true control or concurrent group. These study designs and methods of data collection, lend

themselves to consistent biases, in particular, recall bias and the limitations of using records from charts or databases that were not designed for research purposes.

Many utilization studies are based on data from questionnaires which rely on self-reported CAM use which results in a number of important biases, including bias related to the selection of participants, recall bias, and reporting biases.<sup>80</sup> Factors that may affect accuracy of reporting include: 1) recall time-frame, 2) type of utilization, 3) utilization frequency (number of visits, and event repetition), 4) questionnaire design, 5) mode of data collection, and 6) memory aids or probes used to evaluate the quality of survey studies.<sup>84</sup>

Similarly, for studies reporting utilization based on health claim administrative databases or health record review studies, there are a number of limitations to using this retrospective data. For studies within the U.S., it is likely that patients who are not covered or with insufficient medical coverage will be less likely to seek services; as such there is the potential for selection biases despite large claimant samples.<sup>85</sup> Potential sources of bias include incomplete or miscoded health diagnosis, the type of health treatment, and patient characteristics; this in turn may lead to misclassification and errors with any subsequent linkages.<sup>85,86</sup>

An alternative approach to evaluating general service use is based on the National Ambulatory Medical Care Survey. This methodology collects service visit characteristics close to the time of each patient encounter.<sup>87</sup> This allows for standardized collection of visit data immediately after individual patient encounters, minimizes problems of long term provider recall, limits the artifacts of chart documentation focused on insurance reimbursement requirements, and avoids the pitfalls of retrospective administrative data analysis.

The biases identified thus far are related primarily to the methods used to collect outcomes, but there are additional sources related to the design of the studies. Many studies evaluating health service utilization are based on cross-sectional and other observational study designs. These designs are prone to selection, information and reporting biases. Also problematic is the prevalent use of observational study designs that do not have a control group and do not have standardized criteria for assessment.

In the context of evaluating the literature with respect to CAM use and back pain, it is important to consider all of these potential sources of bias. As we expected, there were some challenges when evaluating methodological quality given the differing designs and outcomes.

## **Research Questions**

The research questions for this systematic review were developed in conjunction with NCCAM, the stakeholder partner for this research. The focus is to evaluate the utilization of CAM therapies, irrespective of the provider (conventional or alternative) for persons with back pain (BP). The efficacy and safety of the various CAM therapies are not evaluated within this study; rather the focus is on patterns of use and costs. Although, the main interest of this review was utilization within the U.S., patterns from Canada, United Kingdom, Europe, Australia, and New Zealand were also evaluated and compared to those in the U.S.

The findings of this evidence review will assist in identifying research priorities for CAM utilization within the U.S. The questions addressed in this review are as follows:



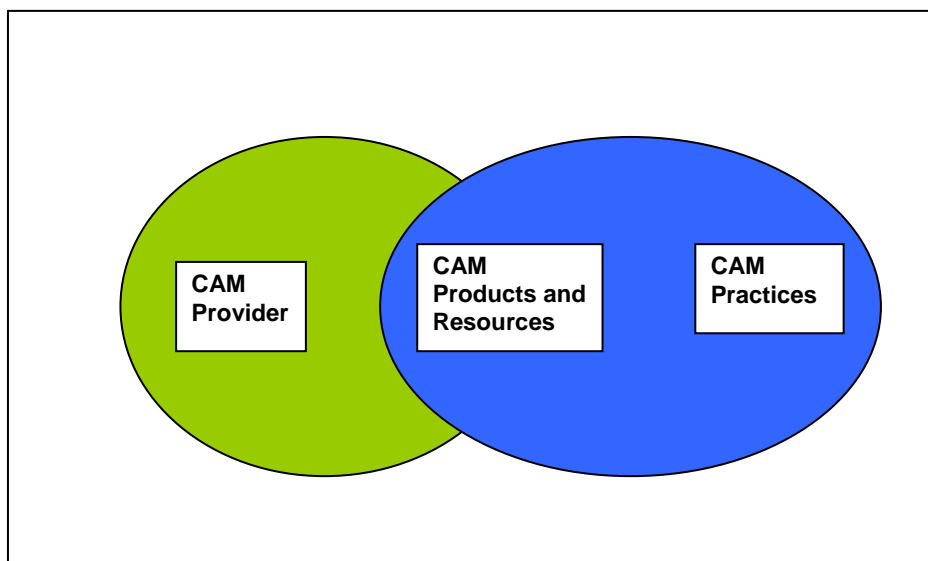
**What complementary and alternative medicine (CAM) therapies are being used for treatment of persons with back pain in the United States? (overarching question)**

- 1) What is the relative utilization for the different CAM therapies?
  - i. Does the utilization differ by where the BP is anatomically located (i.e., neck, mid-back, low back)?
  - ii. Which therapies are used as complementary to conventional care and which are used as alternative?
  - iii. When more than one therapy is used for back pain, how are these combined?
  
- 2) What is the utilization that is recommended by different types of healthcare providers?
  - i. How do these recommendations compare to the actual utilization reported in studies from question one?
  - ii. How do the recommended and actual utilization reported differ by CAM practitioner type?
  
- 3) What are usual costs for these therapies per treatment and for the prescribed course of treatments?
  - i. How much of this cost is covered by insurance or included in the insurance health plan?

# <sup>1</sup>Chapter 2. Methods

## Analytic Framework

The traditional understanding of utilization of health services is a visit to a complementary and alternative medicine (CAM) provider or a CAM service. However, CAM includes the use of products and practices that may not be directed by a CAM provider. As such, we adopted the model by Foubadbakhsh and Stommel<sup>7</sup> (Figure 1). The model is based on Andersen's<sup>8</sup> behavioral model of healthcare utilization but has been adapted for CAM therapies in that healthcare utilization goes beyond provider directed service provision to incorporate CAM resources such as nutritional supplements and self-directed CAM practices like meditation. This model, like the Andersen model, attempts to account for factors that explain or predict utilization; however, the focus of this review is limited to reporting utilization.



**Figure 1: Model of CAM health care use. From Foubadbakhsh and Stommel<sup>7</sup>**

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For the purposes of this review, the adapted model of health service utilization by Foubadbakhsh and Stommel, permits inclusion of studies that describe self-administered resources and self-directed practices as legitimate use of CAM therapy.

## Scope of the Literature Search

Traditional bibliographic databases, CAM specific databases and grey literature sources were searched from 1990 to November 2007. Utilization studies were limited from 1990 forward to reflect relatively current patterns of utilization within the U.S. The search terms used for CAM therapies were broad and comprehensive as we did not want to pre-judge which therapies are

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Appendixes and evidence tables cited in this report are provided electronically at <http://www.ahrq.gov/downloads/pub/evidence/pdf/backpaincam/backcam.pdf>

used for back pain. The traditional medical and allied health databases searched included; MEDLINE<sup>®</sup>; CINAHL<sup>®</sup>; PsychINFO; EMBASE<sup>®</sup>, and Cochrane Central Register of Controlled Trials<sup>®</sup>. Alternative therapy bibliographic databases included: AMED; Index to Chiropractic Literature (ILC); National Library of Health: Complementary and Alternative Medicine Specialist Library; Acubriefs; Bandoliers CAM database; Mantis; Micromedex; Agricola; and HOM-INFORM.

In addition, a grey literature search was undertaken using general and specialty search engines (Google, Scirus, Dogpile, Complete Planet) as well as targeting particular health-related websites such as the National Clearinghouse for Guidelines. A complete list of websites searched and detailed search strategies can be found in Appendix A. The reference lists of eligible studies were also evaluated for relevant articles.

## Eligibility Criteria

### Publication details

#### *Inclusion*

- Language: Limited to English language
- Publication Date: 1990 forward
  - We also searched from 1970 forward for population-based national surveys that may have probed CAM and back pain

#### *Exclusion*

- Publications that are editorials, letters, comments, opinions, abstracts only.

### Country

#### *Inclusion*

For all research questions:

- Studies or Clinical Practice Guidelines (CPG) undertaken within the United States

For the research question on utilization

- Studies undertaken within Canada, the United Kingdom, Europe, Australia and New Zealand. We selected this subset of countries as they are representative of industrialized countries with a public and private mix of healthcare funding and similar healthcare models of conventional care.

#### *Exclusion*

- Studies undertaken in countries other than those listed in the inclusion list

### Intervention (CAM Therapies)

We consulted the list developed by the Committee on the use of CAM by the American Public to develop our search terms.<sup>88</sup> Note that these therapies can be applied by practitioners or through self-directed practice. Also note that we did not restrict the CAM therapy by the type of provider (see population below), rather we categorized these as conventional or alternative. The main categories of CAM therapies are listed below:

### Chemical orientation (with aromatherapy and phytotherapy)

#### *Inclusion*

- botanicals
- foods

- supplements
- diet therapies

We grouped these CAM interventions to reflect their intended biological actions (for example anti-inflammatories, muscle relaxants, etc.) and by the entry route (oral/ dermal/ percutaneous/, injection, suppository, inhalant, infusion)

#### *Exclusion*

There were two primary exclusions related to chemical orientation, and these included drug therapies and medical injections. Although commonly used in the management of back pain, the use of this particular conventional therapy with CAM was not of interest in this review.

- Drug therapy
  - anti-inflammatory drug use (oral or topical including phonophoresis and iontophoresis)
  - analgesic drug use (oral or topical including phonophoresis and iontophoresis)
  - muscle relaxants (oral)
  - psychotropic drugs (oral)
- Medical injections
  - injection: intra-cutaneous (neutral agent)
  - injection subcutaneous (for vasodilator)
  - injection intra-muscular (vitamin, analgesic, local anesthetic neuromuscular paralytic agent)
  - injection: nerve block
  - injections: epidural
  - intravenous glucocorticoid

### **Manual therapies**

#### *Inclusion*

- Manual mobilization techniques such as flexion-distraction
- Manipulation (spinal) Massage techniques
  - relaxation massage (Swedish, spa or sports massage)
  - clinical massage (myofascial trigger point therapy, myofascial release, myofascial release-strain-counterstrain, direct pressure, skin rolling, resistive stretching, cross-fiber friction, Rolfing)
- Movement re-education (Proprioceptive Neuromuscular Fascilitation, strain-counterstrain, Trager, Contract-Relax, passive stretching, resistive stretching, rocking, passive stretching)
- Acupressure

#### **Exclusion**

- Mechanical traction applied with an external device
- Spray and stretch

### **Movement and exercise therapies**

#### *Inclusion*

- Alexander, Feldenkrais, Tai Chi, yoga, Pilates

#### *Exclusion*

- Exercises practiced alone, regular exercise, regular exercise practiced at home, or stretching (in a session, class or at home)
- Exercise that includes strengthening, stretching, stabilizing, coordination, proprioceptive exercises, balance training, cardiovascular training.

### **Acupuncture**

#### *Inclusion*

- Traditional acupuncture, intramuscular stimulation, electrical needle stimulation, electro-acupuncture, laser-acupuncture
- Needling

#### *Exclusion*

- None

### **Mind/Body**

#### *Inclusion*

- Meditation may include all or some of the components of i) breathing, ii) mantra, iii) relaxation, iv) attention and its object, v) spirituality and belief, vi) training
- Meditation can be classified as any of the following:  
Mantra meditation (Transcendental Meditation <sup>TM</sup>, Relaxation Response, Clinically Standardized Meditation)
  - Mindfulness meditation (Vipassana, Zen Buddhist Meditation, Mindfulness-based Stress Reduction, Mindfulness-based Cognitive Therapy)
  - Yoga
  - Tai Chi
  - Qui Gong

#### *Exclusion*

- Patient education in group session form
- Cognitive Behavioral Therapy

### **“Energy” medicine**

#### *Inclusion*

- Biofield
- Johrei
- Healing/therapeutic “touch”
- Polarity therapy
- Reiki
- Qui Gong

#### *Exclusion*

- None

### **In the context of a “whole system”**

### *Inclusion*

- Naturopathy
- Traditional Chinese Medicine
- Chiropractic
- Osteopathy
- Aryurveda
- Homeopathy

### *Exclusion*

- None

## **Home Remedies that are self-administered**

### *Inclusion*

- CAM therapies listed previously but self-administered in non-clinical settings

### *Exclusion*

- None

## **Conventional therapies used with CAM therapies or practitioners**

### *Inclusion*

- Electrotherapy modalities (ultrasound, electrical stimulation, magnetic stimulation, heat, cold, biofeedback)
  - Particularly, interested in the use of these electrotherapy modalities in combination with other primary CAM interventions
  - Transcutaneous electrical nerve stimulation only in combination with other CAM therapies

### *Phototherapies (laser, ultraviolet light, infrared)*

- Sonic therapies (ultrasound, sound waves, shockwave, novasonic, phonophoresis)
- Hydrotherapies (contrast baths, pool therapy)

### *Exclusion*

- Deep brain stimulation
- Back surgery
- Orthoses (foot orthotics, back braces, etc.)

## **Population**

### *Inclusion*

Patients: For all research questions:

- Subjects aged 18 years or older who report having back pain
- Back pain includes the neck, thoracic, or low back regions
- Back pain can include referred or radicular symptoms (i.e., pain radiating into the arm/hand and buttock/leg areas)
- Back pain can be either chronic (>3 months duration), recurrent, subacute (1 to 3 months duration), or acute (<1 month duration)
- Source of the back pain from any of the following sources
  - Musculoskeletal
  - Cancer

- Spinal cord injury
- Previous back-related surgery
- Pregnancy

*Exclusion*

- Back pain from other sources

**Providers (based on NCCAM classification) for all research questions**

*Conventional*

- Medical doctor or specialist, physical or occupational therapist, psychologists, registered nurses.

*CAM*

Other providers not listed above

**Study Designs**

*Inclusion*

For research questions addressing utilization, recommendations, or costs:

- All study designs for primary data collection are included (RCT, observational, time-series, qualitative designs)

For research question addressing recommendations of utilization:

- Clinical Practice Guidelines specific to the United States, or primary studies on provider views about recommended use

*Exclusion*

- Narrative and systematic reviews
- Editorials, commentaries, letters, abstracts, conference proceedings

**Outcomes**

Note that utilization is typically defined as a visit to a clinical provider or clinical entity. However, we are including CAM therapies such as “home remedies” or “self-administered” CAM therapies such as prayer, or supplements (Figure 1).

*Inclusion*

Research Q1: Utilization of CAM therapies can encompass

- Prevalence rates of CAM therapy use or provider visit for a specified time interval (this includes reported proportion of the total number of patients seeking care from a CAM practitioner for back pain).
- Frequency of visits or use of CAM therapies or provider
- Timing of visits (if possible in relation to the pain inception)
- Duration of use of CAM therapy for period surveyed
- Duration of each visit

Research Q2: Recommended use of CAM therapies for back pain

- Recommendations regarding use of CAM focusing on the frequency or duration of treatment

Research Q3: Costs associated with CAM therapies specific to the United States

- Direct costs for patient including CAM practitioner fees, diagnostic costs, therapy costs (needles, remedies, etc.)
- Direct non-therapy related costs for patient (transportation costs, costs of accompanying patients, etc.)

- Direct costs for provider (space and equipment provisions, ancillary staff, office costs, etc.)
- Indirect costs for patient (time off work to attend therapy, etc.)
- Induced costs for patient (adverse reactions due to CAM therapy)

*Exclusion*

- Non-utilization or cost outcomes such as measures of clinical efficacy or effectiveness

## **Data Collection and Reliability of Study Selection**

A team of study assistants trained in the eligibility criteria for title and abstract screening were assembled. Standardized forms (Appendix B) and a guide manual explaining the criteria were developed from previous templates used in reviews for the Agency for Health Research and Quality (AHRQ) reviews; these forms were constructed within Systematic Review Software (SRS 3.0 (TrialStat Corporation, Ottawa, Ontario Canada). Two reviewers were required to achieve consensus on the identification, selection, validity and abstraction of articles and information. Disagreements that could not be resolved by consensus were resolved by a member of the investigative team. The level of agreement on inclusion of reports (full text) between observers was measured using a kappa statistic.

## **Quality Criteria**

We anticipated that most of the eligible studies would be observational designs without a true control or concurrent group. Moreover, we anticipated that much of the utilization data would be collected by patient and practitioner recall surveys, and chart review or analysis of administrative health claim databases. In general, these methods suffer from recall bias and limitations inherent in records or databases not designed for research purposes. Given the nature of the study designs, and the means used to collect utilization data, a standardized quality criteria checklist specific to observational designs with control groups could not be applied to this literature.

For studies evaluating utilization, we focused on the means used to collect utilization outcomes as the basis of determining the potential for bias. We identified studies that used self-report via questionnaire or interview and evaluated these with respect to the following: 1) the selection of participants, 2) response rate, 3) recall time-frame, 4) questionnaire design (pre-testing), and 5) mode of questionnaire data collection.

For studies using chart review or administrative databases we considered the following: 1) manner in which patients or visits were identified, and 2) description of data linkages between use and patient identifiers.

For clinical practice guidelines that provided utilization data, we selected the use of the AGREE instrument for quality assessment.<sup>89</sup> Studies that were true economic evaluations (only those classified as cost-utility analyses, cost-effectiveness analyses, cost-minimization analyses, cost-benefit analyses, and cost-consequences) were evaluated for quality. Standardized methodological criteria for economic analyses are available and the Quality of Health Economic Studies (QHES) was selected to evaluate quality.<sup>90</sup>



## Summarizing the Findings Descriptive and Analytic Approaches

Data were collected on the sample size, characteristics of the population(s) studied, type of back pain evaluated, the definition of an episode of care, type of CAM intervention and utilization outcomes assessed. Standard evidence tables were developed. We used a qualitative synthesis to evaluate the quality of the studies eligible for this review.

**Subgroup synthesis.** We divided the eligible citations into U.S. versus non-U.S. studies. Furthermore, we evaluated eligible studies divided into subgroups based on: a) anatomical location of the back pain and utilization, and b) the types of therapies used concurrently and which of these are used as complementary versus those used as alternative. We ask the reader to note the distinction between publications and studies. Some of the eligible publications are related to each other and are often termed companion studies. These companion publications may be based entirely or in part on patient cohort data. In general, these companion studies present subgroup analyses, re-analyses, or secondary analyses (linking previous data with new utilization data). In some cases the citations were related because of subsequent follow-up collection. Consensus on a convention to show the relationships between such publications (differing analyses on the same patient cohort) does not exist; some consider these analyses in and of themselves to be “new studies”. For this reason, we have selected to use the term publications to specify the number of eligible studies. We attempt to alert the reader when publications are companion in nature and to specify the nature of the relationship.

## Chapter 3. Results

From an initial inclusion of 8,347 unique citations, 8,108 were excluded as they were not on topic, not English language publications, or not undertaken within the countries of interest (see Figure 2). The remaining 239 were identified as potentially being about complementary and alternative medicine (CAM) and about utilization, costs, patient or provider views, recommendations about optimal frequency and duration of visits, or clinical practice guidelines (CPG).

The full text publications for these 239 citations were retrieved and from these 95 were excluded as not addressing utilization, costs, or recommendations for use of CAM. Following full text screening, we further excluded non-U.S. publications for cost-related outcomes ( $n = 19$ ), as comparability with American costs for CAM use would be limited. Our complete eligibility criteria were met by 103 publications for utilization, recommendations, and costs related to CAM use.

We partitioned CPG reports or publications related to recommended use of CAM (Figure 2). From these, eight CPG were excluded as not providing any specific recommendations on CAM use for back pain. Additionally we separated primary publications ( $n = 22$ ) of provider or patient views about CAM utilization. Eighteen of these publications on provider or patient views were excluded as these did not provide information on “recommended” use of CAM therapies.

We grouped eligible publications according to their primary focus on utilization, recommendations for frequency of use, or costs associated with use of CAM; these publications were further divided into those undertaken within the U.S. and those from the other countries eligible for this systematic review. Figure 2 shows the overlap.

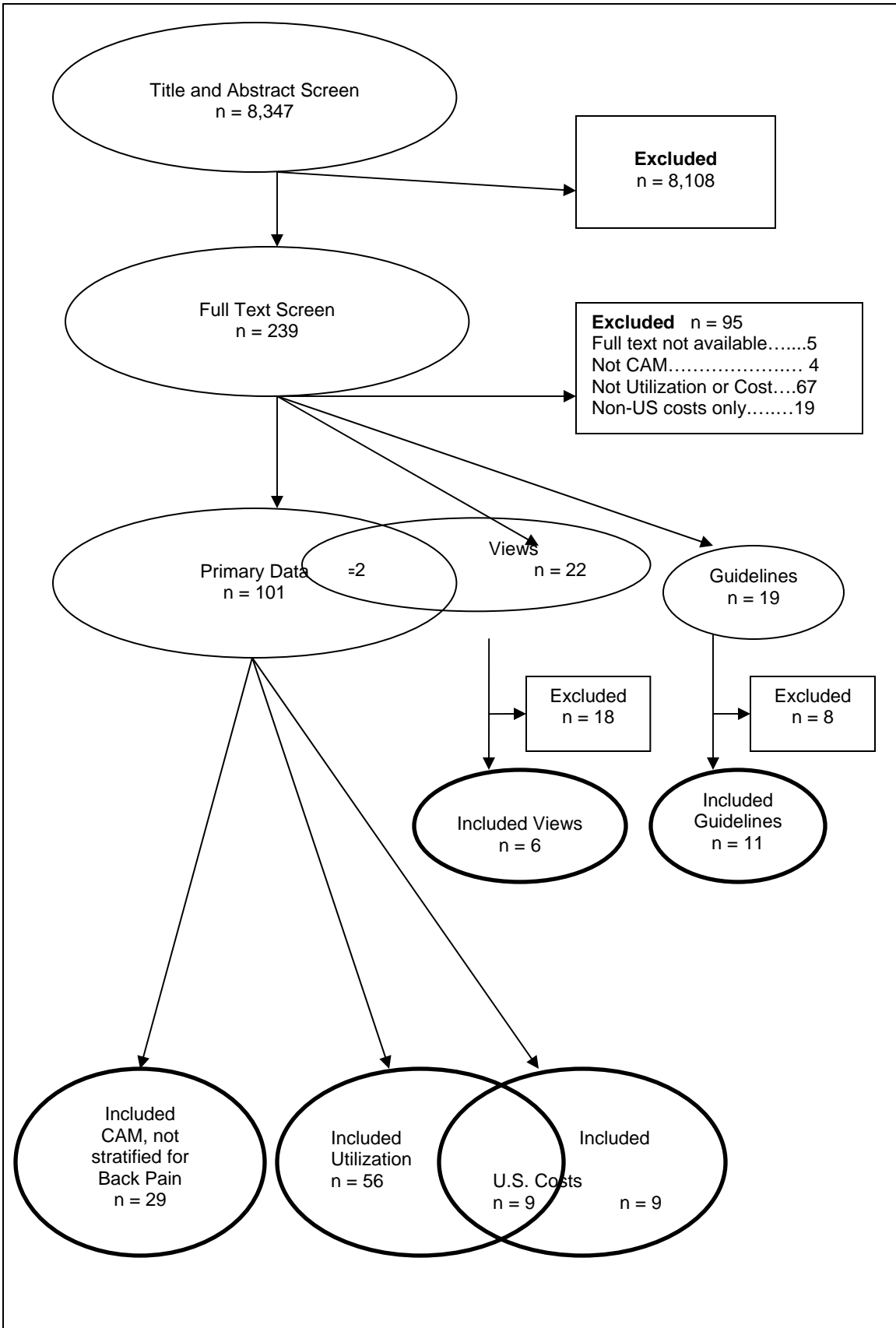


Figure 2. Flow of publications from initial search to final eligibility

## **Question 1. What is the Relative Utilization for the Different CAM Therapies?**

A total of 94 publications provided some information on utilization specifying either the prevalence of visits to CAM practitioners or more detailed service use based on specific therapies. These include publications based both within the U.S. and within other eligible countries including: Canada, United Kingdom, Europe, Australia, and New Zealand. Approximately one-third of the publications presented utilization of CAM but did not stratify these results specifically for persons with back pain. The remaining publications were partitioned to address: 1) relative utilization of CAM therapies evaluated concurrently, 2) trends over time, and 3) individual CAM therapy utilization for the most prevalent provider-based CAM therapies. There was significant overlap of publications among the research questions addressed in this review. The majority of publications (52 of 65) reported some aspect of use related to chiropractors, or chiropractic, or manipulation, or mobilization. Despite the overlap we summarize findings and quality assessment for each section and for the utilization publications as a whole.

### **Utilization of CAM, Data not Stratified by Back Pain or Therapy**

Twenty-nine publications did not stratify CAM utilization data with respect to use by persons with back pain. Rather than exclude these publications, we chose to identify and detail some aspects of these studies; many of these publications are recognized as contributing significantly to our current understanding of CAM utilization. Our intention was to highlight that these studies were lacking in utilization results specific to persons with back pain, despite being the sources that originally identified back pain patients as a key population that utilize CAM services. Similarly, we wished to highlight that several of the non-stratified studies evaluated different subgroups of persons that experience significant back pain related to spinal cord injuries, cancer, or pregnancy. Nineteen publications<sup>6,47,71,76,91-105</sup> were based on utilization data from the U.S. and 10 publications<sup>106-115</sup> were from other eligible countries.

### **Utilization not Stratified by Back Pain Within the United States**

Several American studies are seminal works based on large national samples<sup>6,71,76,98,99,102,105</sup> that surveyed CAM utilization and established that back and neck pain were important reasons for seeking CAM treatments. However, the utilization data presented did not link the specific type of CAM therapy to persons with back pain; rather the prevalence of back pain within the samples was reported. Four publications<sup>101-104</sup> were based on the same study cohort, representing survey results from a national sample.

Three publications focused on persons with spinal cord injuries. Two of the publications<sup>92,93</sup> on spinal cord injury patients showed that back and neck pain was frequently a major source of their chronic pain (varying from 46 to 75 percent), but did not present stratified CAM utilization information. One study<sup>92</sup> reported utilization of CAM combined with medical injections to manage pain.

One study<sup>91</sup> evaluated the use of CAM for cancer and other chronic pain in American Veterans. Other publications identified CAM use within patients presenting to the emergency

department,<sup>95</sup> a specialized CAM clinic within a university hospital,<sup>100</sup> or concurrent use of CAM in patients attending outpatient physiotherapy departments.<sup>96</sup> Another study<sup>97</sup> indicated the use of mind body therapies among patients with musculoskeletal pain. One study<sup>47</sup> assessed the use of CAM by pregnant women; although rates of back pain are very high within this population, the publication did not specify the trimester or whether or not the whole sample was experiencing back pain at the time of the study.

**Summary of U.S. publications on utilization not stratified by back pain.** Nineteen publications were based on utilization data from the U.S. Although, these establish that back pain was an important symptom for which patients sought services, they do not present results on utilization of CAM therapies stratified for persons with back pain. Several studies evaluated subgroups of patients with non-musculoskeletal related back pain and would suggest that CAM therapies are commonly used by these populations.

## Utilization not Stratified by Back Pain Within Other Countries

There were 10 publications from other eligible countries that did not present utilization data stratified for persons with back pain. One study<sup>106</sup> evaluated neck and shoulder pain in newspaper workers, another the general population in Canada.<sup>115</sup> Three publications<sup>108,110,111</sup> evaluated physiotherapy outpatients and another<sup>107</sup> patients at osteopathic clinics. One study<sup>109</sup> evaluated the use of a chiropractic activator and another, general population with back pain in the United Kingdom.<sup>114</sup> Another study evaluated persons with spinal cord injuries in Sweden.<sup>112</sup> Finally, one study evaluated the general population in Spain.<sup>113</sup>

**Summary of non-U.S. publications on utilization not stratified by back pain.** Ten publications were based on utilization data outside the U.S. No clear pattern emerges from these studies; there are differences in populations, providers, and CAM therapies evaluated that contribute to this heterogeneity.

## Relative use of CAM Therapies

We identified publications that presented the relative frequency of CAM utilization in order to rank the most to least frequently used therapies by persons with back pain. We identified four U.S.<sup>9-12</sup> and four non-U.S. publications<sup>116-119</sup> that reported utilization data for a minimum of four different CAM therapies or practitioners. An additional study<sup>30</sup> reporting more than four CAM therapies provided solely by a physical therapist, was not included in this grouping. Electrotherapies provided by conventional providers (such as physical therapists) were defined as non-CAM therapy; however, this publication provided utilization data for spinal manipulation and is detailed in the specific CAM therapy section below.

We did not select publications where subjects were recruited from the practices of CAM providers. The utilization patterns described within these studies would reflect practice patterns of concurrent CAM therapies and not that of relative utilization of CAM services. For example, utilization of differing CAM therapies reported from subjects currently receiving care by a chiropractor would reflect the manner in which this particular CAM practitioner combines various CAM modalities rather than the frequency with which persons with back pain would choose to use one CAM therapy over another. The manner in which CAM therapies are concurrently combined for treatment is described within the specific CAM therapy sections that follow.

Table 1 compares reports of the use of four or more different CAM therapies for back pain. Note that the proportion of use was not exclusive to a single category; most subjects reported using more than one CAM therapy for lifetime use. What was generally not specified within these publications was the order in which CAM therapies were selected for single or multiple episodes of care.

## Relative Utilization of CAM Therapies Within the United States

Of the four U.S. publications for which relative utilization could be evaluated, all but one<sup>9</sup> measured lifetime use of CAM (Table 1). All subjects within these publications had chronic or recurrent back pain. The sample sizes for those seeking care varied from 186 to 2,374 subjects. A single study<sup>9</sup> reported the use of CAM therapies for a subgroup of the chronic back patients (69 percent seeking care within the last 6 months); the other publications reported on CAM use for the entire study sample with back pain. One publication<sup>12</sup> reported on combined neck and back pain and the remaining ones on LBP. A single publication<sup>12</sup> was based on a randomly selected population sample and another on North Carolina residents.<sup>9</sup> The remaining publications were based on patients with chronic pain.<sup>10,11</sup> All publications evaluated utilization with respect to the proportion of patients who used any of several CAM therapies and all but one study<sup>10</sup> reported on the percent accessing at least one CAM provider.

Table 1 shows the relative utilization rates across the four U.S. publications. Chiropractor/chiropractic was the CAM therapy that was most frequently used by patients with chronic LBP or combined neck and back pain.<sup>10-12</sup> In one study<sup>9</sup> massage was the most frequently used CAM therapy; massage was also highly utilized in the other publications ranking second most frequent (Table 1). Although the use of ultrasonography, electrotherapy, and heat and cold modalities was high (18 to 68 percent), the provider of these therapies was not specified and treatment may have been provided by non-CAM practitioners. Other frequently used modalities were prayer and spirituality (27 to 42 percent) and glucosamine (26 to 46 percent); but these were reported in only two of the four publications. Both prayer and glucosamine were likely to be self-administered. It is probable that the empty cells within Table 1 can be accounted for by differences in study protocols with regards to which, of many potential CAM therapies, were probed.

Three publications<sup>9-11</sup> specified that there was overlap in use of the various CAM therapies, but type of therapy overlap was not detailed. One study<sup>12</sup> indicated that more than one CAM practitioner may have provided the therapy in the estimates of utilization. Similarly, overlap with conventional providers was not stratified for specific CAM therapies; a single study specified overlap with chiropractors alone but not other CAM practitioners.<sup>9</sup>

**Summary of relative utilization of CAM therapies in persons with back pain in the U.S.** There are a limited number of publications (n = 4) based on population-based samples that show the relative use of CAM therapies in persons with back pain. Two of these publications recruited subjects from large general population-based samples, and two recruited samples with chronic LBP. In general, these publications show that chiropractic/spinal manipulation is the most frequently utilized provider based CAM therapy followed by massage and acupuncture. Prayer and herbals and food supplements were also frequently used (self-practiced) CAM therapies although they were only evaluated in half the publications. Differences in study protocols for probing the type of CAM therapies used likely account for missing utilization data from the range of CAM services available in Table 1. Rates of utilization may also vary because of

differences in populations and in location of back pain. The methodological quality of these four studies is generally good with minimal biases and valid results.

## Relative Utilization of CAM Therapies Outside the United States

Three publications<sup>116-118</sup> evaluating CAM use in Canadians and one<sup>119</sup> in Australians provided information on at least four different therapies (Table 1). These publications evaluated a combination of neck and back pain,<sup>116,117</sup> unspecified back pain,<sup>118</sup> or LBP.<sup>119</sup>

Two companion publications<sup>116,117</sup> reported utilization with respect to the proportion of back pain patients using specific CAM therapies rather than the proportion relative to all persons with back pain. Three publications<sup>116-118</sup> found chiropractic to be the most frequently used modality/practitioner, with massage in second place (Table 1). In another study<sup>119</sup> massage was the most frequently used CAM therapy. Acupuncture was the third most frequently used modality in two studies.<sup>116-118</sup> The use of prayer and spirituality was reported in three of the publications but varied significantly. The use of herbals and food supplements was reported in a single study.<sup>116,117</sup> These resources were excluded from the operational definition of CAM within another study.<sup>118</sup>

Two related publications<sup>116,117</sup> did not specify complementary or combined CAM therapy use. Two publications<sup>118,119</sup> evaluated patients with back pain alone and presented the degree of overlap with other CAM therapies. One of these publications<sup>118</sup> showed a degree of overlap with conventional providers that varied from 6 percent with any physician to 1 percent with specialists; similarly, overlap with other conventional providers varied from 2 percent with physiotherapists to 0.3 percent with psychologists.

**Summary of relative utilization of CAM therapies in persons with back pain.** There are four publications based on population-based samples that show the relative use of CAM therapies in persons with back pain outside the U.S. These publications reported predominately on combined or unspecified back pain of variable duration. All publications undertaken outside the U.S. were based on larger, randomly selected, population-based samples. Three of these publications show that chiropractic/spinal manipulation is the most frequently utilized provider-based CAM therapy followed by massage and acupuncture. Prayer and herbals and food supplements were also frequently utilized CAM therapies although the rates of use were highly variable. Differences in study protocols with regards to probing the type of CAM therapies used likely account for missing utilization data from the range of CAM services available in Table 1. Rates of utilization may also vary because of the differing populations, as duration and location of back pain were combined or not specified in these studies. In general, these cross-sectional studies are rated as high quality with few biases and valid results.

## Trends in CAM Utilization

We identified 10 publications within the U.S.<sup>5,19</sup> and other countries<sup>112,117,120-125</sup> containing data on the trends across time in the utilization of CAM interventions for back and neck pain. These papers were published between 1996 and 2007 and examined trends between 1962 and 2006. They had various designs and included patients with neck and/or back pain. Specifics regarding these publications are located in summary Tables 2 and 3.

## Trends in Utilization Within the United States

For those with LBP only, study<sup>19</sup> showed that in 1987, 41 percent used chiropractic medicine and in 1997, 31 percent. Another study found that in 1990, 36 percent of individuals with unspecified back pain used a CAM therapy while 20 percent saw a CAM practitioner; in 1997, 48 percent used CAM for back pain while 30 percent saw a CAM practitioner.<sup>5</sup> This same study found that in 1997, 57 percent of individuals with neck pain used a CAM therapy and 37 percent saw a CAM practitioner.<sup>5</sup>

**Summary of trends in CAM utilization within the U.S.** The limited literature on trends over time would suggest that utilization of chiropractic/spinal manipulation for LBP in the U.S. has decreased, while the use of CAM generally has increased, although data on specific CAM therapies was not reported. More research is required to highlight trends in the utilization of CAM therapies for back pain in the U.S.

## Trends in Utilization Outside the United States

One study of LBP patients in the United Kingdom found that osteopathy was used by 49 percent of patients over an 18 month period.<sup>122</sup> Note that osteopathy practices outside of the U.S. may differ in the types of CAM therapies administered. Another study found that over a 4-year period acupuncture was used for LBP by 9 percent of patients from teaching hospitals and 32 percent of patients from general hospitals.<sup>125</sup> One study from the Netherlands found that between 1989 and 1992, physical therapists (PT) administering massage and passive mobilizations were used by 12 percent of those suffering from LBP. This increased to 15 percent in 2002 to 2003.<sup>121</sup> A Canadian study found that between 1996 and 2002 glucosamine was used by 5 percent of men and 10 percent of women with back pain.<sup>120</sup> A study from Norway found that in 1992, 59 percent of non-referred and 62 percent of referred chiropractic patients had LBP.<sup>124</sup>

For those suffering from neck and back pain, in Canada, “in the past 12 months” the following utilization rates of CAM therapies were reported: chiropractic care 61 percent; massage 39 percent; acupuncture 30 percent; energy healing 16 percent; yoga 14 percent; relaxation techniques 10 percent; and prayer/spiritual practice 5 percent.<sup>117</sup> In Denmark, between 1962 and 1999 patients visiting chiropractors increased by over 7 percent for the primary complaint of LBP alone, decreased by almost 9 percent for LBP with sciatica; increased by over 3 percent for neck pain, and remained essentially the same for neck and arm pain.<sup>123</sup>

**Summary of trends in CAM utilization outside the U.S.** The limited literature on trends in countries outside the U.S. would suggest that utilization rates differ between countries and between specific CAM interventions. More research is required to determine the extent of these differences. No data were reported on the usual costs for these therapies per treatment or for the prescribed course of treatments.

## Specific CAM Therapy Utilization: Acupuncture

Eighteen publications provided data on utilization of acupuncture by back pain patients. Of these, eight were specific to the U.S.;<sup>10-12,15,16,18,44,45</sup> two of these publications were based on the same sample.<sup>15,44</sup> Ten publications provided utilization outcomes from other eligible countries;<sup>51,116-119,125-129</sup> one publication<sup>117</sup> was a companion to a previous study<sup>116</sup> as it



incorporated the findings of the initial survey and utilization from a resampling of new subjects 6 years later. The variation in the samples recruited for these studies is noteworthy and includes subjects from large population-based surveys or administrative databases and subjects from small clinical practices, or populations limited only to patients with back pain. As expected, the estimates of utilization varied substantially based on the type of denominator used to estimate prevalence.

## Acupuncture Utilization Within the United States

There were eight U.S. publications that provided data on acupuncture utilization in persons with back pain. Three of these were of cross-sectional design using interviews.<sup>12,18,45</sup> Three publications from two study cohorts used a single group prospective cohort study design based on interviews<sup>15,44</sup> and self-administered questionnaires.<sup>11</sup> One study was a retrospective design using data from a health claims database<sup>16</sup> and another was a randomized controlled trial<sup>10</sup> that used a self-administered questionnaire to evaluate use of CAM.

Two publications<sup>12,45</sup> reported CAM utilization based on samples from the general population. Two publications recruited subjects from health claims databases in Washington state.<sup>16,18</sup> Two publications<sup>15,44</sup> randomly sampled licensed acupuncturists and patients in their practices from seven states, including Washington and Massachusetts. One study recruited subjects from large urban specialty clinics for orthopedic or neurosurgery consultation<sup>11</sup> and another recruited a small sample of back pain subjects who had access to the internet.<sup>10</sup>

Utilization was primarily defined as a visit to an acupuncturist or having received or “ever tried” acupuncture based on self-report with or without information from health records. Three publications queried use “within the last 12 months”,<sup>10,12,45</sup> three<sup>11,18,45</sup> reported “lifetime” use, and two<sup>15,44</sup> reviewed visits to practitioner over a 1-year interval.

Only one of the publications<sup>15</sup> provided any detail as to the type of acupuncture administered. This same study was the sole publication to provide information about the mean duration of the visits (60 minutes) but it did not specify the frequency of visits over the course of treatment. The training or type of acupuncturist was specified as “licensed acupuncturist”,<sup>15,18,44</sup> in three publications; the remaining eligible publications provided no further details about the practitioner.

**Acupuncture utilization based on anatomical region.** Tables 4A to 7A show utilization of acupuncture in the U.S. specific to neck pain (n = 2), unspecified back pain (n = 4), LBP (n = 3) and combined back and neck pain (n = 1). Neck pain utilization was reported in two publications<sup>44,45</sup> from general population samples and the use of acupuncture varied from 7 to 14 percent of persons with neck pain of unspecified severity and duration. Four publications<sup>10,15,44,45</sup> reported utilization for unspecified back pain (Table 5A) and found widely varying rates for the use of acupuncture, from 2 percent (recurrent but not disabling back pain from small sample) to 34 percent (severity and location not specified).

Similarly, the three publications<sup>11,16,18</sup> evaluating the use of acupuncture for LBP patients (Table 6A) showed rates ranging from 3 to 11 percent of the total sample of subjects; two of these publications<sup>11,18</sup> indicate the back pain was chronic in nature. One study<sup>12</sup> (Table 7A) reported acupuncture use for patients with combined neck and back pain and showed a utilization rate of 0.9 percent (95 percent CI, 0-1.9), and an estimated total of 1.6 million visits (mean of 2.6 visits); this study also reported no difference in the relative frequency of CAM use by location of the back pain. However, a single study<sup>45</sup> that segregated rates for persons with neck and back

pain found that acupuncture was used more frequently for back pain than for neck pain (34 versus 14 percent).

It is important to note whether the denominator used to estimate utilization was based on the entire sample enrolled or just a specific subset of patients with back pain. Two studies<sup>12,45</sup> were based on general population samples and, not surprisingly, showed markedly lower rates of acupuncture utilization for both neck and unspecified back (1 to 4 percent) and combined neck and back pain (1 percent) than studies that recruited smaller samples of persons all of whom had back pain.

Acupuncture use as complementary care or combined with other CAM. The majority of publications did not collect or report sufficient information to determine concurrent use of conventional with CAM therapies for back pain. Two publications provided information on use with conventional care but were not specific to those respondents with back pain<sup>44</sup> or specific to those receiving acupuncture<sup>12</sup> (Table A2 and A4). Although not stratified for persons with back pain, up to 53 percent of acupuncture patients saw a medical or osteopathic physician, but only 10 percent of persons with back pain reported speaking to their doctor about using acupuncture.<sup>44</sup> Another study<sup>12</sup> suggested that CAM alone had been used by 29 percent of persons with back and neck pain; however, this was not specific to those receiving acupuncture.

Most studies did not report concurrent or combined use of different CAM therapies in a detailed manner. Overall, when conventional or combined therapy details were reported, the results were not stratified with respect to using acupuncture or specifically for those with back pain (Tables 4B to 7B). There was one exception<sup>15</sup> and this publication indicated that acupuncture was used predominately with other CAM therapies such as east Asian massage, cupping, heat, and herbs.

**Quality assessment of U.S. acupuncture publications.** Only one<sup>10</sup> of the eight U.S. publications on the utilization of acupuncture for back pain used a study design with a true comparator group; as such the focus of our quality assessment is on the potential for selection and reporting biases. All but a single publication<sup>16</sup> are based on self-reported utilization and therefore subject to recall bias; heterogeneity with respect to survey versus interview and the types of CAM services queried are also important sources of reporting bias.

Two<sup>12,45</sup> of three cross-sectional publications were of high quality, reporting CAM utilization based on random sampling of the general population with adequate response rates (74 and 63 percent respectively). The third study<sup>18</sup> recruited subjects from a health database and then subsequently interviewed them. This study had a low response rate (36 percent) and had the potential for selection bias as the eligible sample had to have back pain (44 percent were ineligible due to no longer having back pain). One study, based on a large health insurance claims database, would also be considered high quality as it used standardized coding for back pain classification, provider visits, and treatments.<sup>16</sup>

There is greater potential for selection bias in studies using samples obtained from provider clinics. Two publications<sup>15,44</sup> randomly sampled licensed acupuncturists using a recruitment strategy based on the National Ambulatory Medical Care Survey. This methodology collects service visit characteristics close to the time of each patient encounter thereby minimizing longterm provider recall, errors from chart extraction, and retrospective administrative data analysis. The two remaining studies recruited chronic back pain subjects who had been referred for orthopedic or neurosurgery consultation or from urban specialty clinics<sup>11</sup> and a small sample of back pain subjects who had access to the internet.<sup>10</sup> As noted previously, the rates of use for patients already seeking treatment differ from those in the general population; additionally, those already seeking CAM therapy services may possess inherent differences in defining characteristics that are not easily determined in the absence of comparison groups.

Across all eight U.S. publications, the methodological quality is rated as fair, indicating that they are susceptible to some biases but these, being somewhat endemic to self-report, are not sufficient to negate the results.

**Summary of utilization for back pain for U.S. acupuncture publications.** Eight publications evaluated the use of acupuncture in persons with back pain and all but one used self-report methods.<sup>16</sup> Two of these studies<sup>12,45</sup> were based on randomly selected general population samples and, as expected, these showed markedly lower rates of utilization for both neck and unspecified back (1 to 4 percent) and combined neck and back pain (1 percent). Similar rates of utilization were observed (1 percent) in a study evaluating a large administrative database. All other studies based primarily on subjects from clinical practices or with back pain showed higher rates of utilization (7 to 36 percent). Rates of use also varied by the timeframe for recall (12 months to lifetime prevalence), the interval of analysis for administrative databases, and recruitment of subjects from clinical practices.

The majority of publications evaluated LBP or unspecified pain, with utilization for neck or combined neck and back problems being less commonly assessed. No clear pattern emerges for acupuncture utilization rates as a function of region of the back; in part this is due to the limited number of studies, but it may also be related to the lower prevalence of neck pain relative to LBP.

Only one of the publications<sup>15</sup> provided any detail as to the specific type of acupuncture provided. A single publication<sup>44</sup> presented information on concurrent conventional care with acupuncture. When reported, conventional care overlap was generally not stratified for acupuncture. Similarly, a single publication<sup>15</sup> sufficiently detailed combining of other alternative therapies with acupuncture. Overall these studies were rated as having fair methodological quality, indicating that they are susceptible to some biases. These threats to validity are somewhat endemic to the use of self-report of utilization but are not sufficient to negate the results.

## Acupuncture Utilization Outside the U.S.

Of the 10 publications on utilization outside of the U.S., three<sup>116-118</sup> were based in Canada, three<sup>125,128,129</sup> in the United Kingdom, three<sup>119,126,127</sup> in Australia, and one<sup>51</sup> in Germany.

Six of the 10 publications were of cross-sectional design with utilization outcomes derived equally from interviews<sup>116-118</sup> or self-administered questionnaires (Tables 4A to 7A).<sup>119,127,128</sup> Three publications used medical chart data and a cohort study design with non-concurrent (historical) control,<sup>129</sup> a single group prospective study design,<sup>126</sup> and a before after study design.<sup>125</sup> Another study used a single group prospective cohort design<sup>51</sup> based on all subjects enrolled in a randomized controlled trial (RCT) and using interview data.

Half the studies recruited participants from the general population, including a national sample within Canada,<sup>116-118</sup> one within Australia,<sup>119</sup> and one of Australian women.<sup>127</sup> The remaining studies recruited subjects from specialized outpatient or pain clinics,<sup>125,126,128</sup> and general medical practices.<sup>51,129</sup>

Utilization was primarily defined as a visit with an acupuncturist or having received or “ever tried” acupuncture. In addition to a visit to a CAM practitioner, one study<sup>118</sup> included “discussed CAM with, a non-mainstream practitioner” and “looked for a support group when faced with a health problem” as utilization. Half the publications<sup>51,116-118,127</sup> queried use within the last 12

months, and two publications<sup>119,125</sup> reported use within 6 months or less. One study<sup>128</sup> did not report a timeframe and another<sup>126</sup> reviewed visits over a 6-year interval.

None of the publications provided details as to the type of acupuncture provided. Only two publications indicated that the provider was either a medical acupuncturist<sup>129</sup> or was likely a conventional practitioner.<sup>125</sup>

**Acupuncture utilization based on anatomical region.** None of the non-U.S. publications provided utilization specific to the neck and the use of acupuncture. In the three publications that did not specify the location of the back pain (Table 5A), rates of acupuncture use varied from 3 percent<sup>127</sup> to 29 percent of those with back pain.<sup>126</sup> Table 6A shows the five publications that evaluated acupuncture use in persons with LBP, and rates varied from 2 percent<sup>119</sup> to 19 percent.<sup>129</sup> Two related publications<sup>116,117</sup> (Table A4) that combined neck and back pain reported that 28 to 30 percent of back pain patients used acupuncture. No clear trend emerges for the utilization of acupuncture as a function of back region; neck pain specifically was not evaluated in these eligible studies and the other back regions showed a similar range of rates of use. In general, as one would expect, rates of use of acupuncture were lower in population-based samples than those publications with samples from specialty clinics which tended to be smaller in number. It is this factor, rather than the back region that accounts for the majority of observed variability; the timeframe interval and methods used to collect rates of use are also important factors in explaining variability.

**Acupuncture use as complementary care or combined with other CAM therapies.** Seven publications did report some information regarding use of conventional care with CAM. Three of these<sup>116-118</sup> did not stratify the proportions specific to persons reporting back pain and one did not stratify by practitioner type<sup>119</sup> (Table 4A and 7A). Three publications<sup>51,125,128</sup> reported use of acupuncture with conventional care and found rates of overlap varying from 90 percent<sup>128</sup> to 63 percent.<sup>51</sup> Three publications indicated that patients used medications and injection therapies<sup>128</sup> (16 to 75 percent), and mixed therapies (medications, nerve blocks, electrotherapy, and transcutaneous electrical nerve stimulation).<sup>51,125</sup>

The majority of publications did not provide detail regarding concurrent or additional use with other CAM therapies. Two publications<sup>51,119</sup> indicated use of acupuncture with other CAM therapies including chiropractic (46 percent) and massage (37 percent).<sup>51</sup>

**Quality assessment for non-U.S. acupuncture publications.** Seven<sup>51,116-119,126,127</sup> of 10 non-U.S. publications used self-reported utilization data and were subject to some degree of recall bias. The remaining three publications<sup>125,126,129</sup> used medical health record information. Six of the 10 publications were of cross-sectional design with utilization outcomes derived equally from interviews or self-administered questionnaires; of these, five publications<sup>116-119,127</sup> were derived from random population samples, with one<sup>127</sup> being limited to older Australian women. However, the response rate was low (19 to 26 percent)<sup>116,117</sup> or not reported<sup>118,127</sup> in four of these publications. Three publications using non-comparative study designs recruited patients from general practices<sup>129</sup> or specialized pain clinics.<sup>125,126</sup> For these 10 non-U.S. studies the overall methodological quality is fair, suggesting some susceptibility to bias, but not sufficient to negate all the results.

**Summary of utilization for back pain for non-U.S. acupuncture publications.** Ten publications undertaken in Canada,<sup>116-118</sup> the United Kingdom,<sup>125,128,129</sup> Australia,<sup>119,126,127</sup> and Germany<sup>51</sup> evaluated the use of acupuncture in persons with back pain. Three of these<sup>125,126,129</sup> retrieved utilization data from health records rather than using self-report methods; the quality of utilization data retrieved was limited by lack of standardized extraction methods. Six of the

publications<sup>51,116-119,127</sup> using interview or survey methods were cross-sectional studies. Five of these selected random population samples and found utilization rates varying from 2 percent<sup>119</sup> to 30 percent.<sup>116,117</sup> Differences in timeframes queried may account for this variation.

Of the 10 non-U.S. publications, five<sup>51,116-118,127</sup> probed use within the last 12 months, and two<sup>119,125</sup> reported use within 6 months or less. One publication<sup>128</sup> did not report a timeframe and another<sup>126</sup> reviewed visits over a 6-year interval.

The majority of publications evaluated LBP (n = 5) or unspecified pain (n = 3) and none evaluated or reported specifically on neck pain. No clear trend for utilization rates as a function of region of the back was observed in the non-U.S. studies. None of the publications provided details as to the type of acupuncture provided and only two publications specified the type of practitioner.<sup>125,129</sup> Although seven publications did report some information regarding use of conventional care with acupuncture, four of these did not either stratify results by persons with back pain<sup>116-118</sup> or specify the CAM practitioner;<sup>119</sup> the remaining three publications<sup>51,125,128</sup> showed overlap varying from 63 to 90 percent. The majority of publications did not provide sufficient detail regarding concurrent or additional use with other CAM therapies. Two publications<sup>51,119</sup> indicated use of acupuncture with other CAM therapies including chiropractic (46 percent) and massage (37 percent).<sup>51</sup> For these 10 non-U.S. studies the overall methodological quality is fair, suggesting some susceptibility to bias, but not sufficient to negate all the results

## **Specific CAM Therapy Utilization: Massage**

Nineteen publications provided information on the utilization of massage in persons with back pain. Of these, 12 were specific to the U.S.<sup>9,11,12,15,16,18,20,22,23,30,33,44</sup> Seven of these publications are based on three patient study cohorts from Oregon State medical and chiropractic practices,<sup>20,22,23</sup> the practices of licensed CAM practitioners in Connecticut and Washington,<sup>15,44</sup> and North Carolina.<sup>9,30</sup> Eight publications provided utilization outcomes from eligible non-U.S. countries;<sup>51,116-119,121,130,131</sup> one publication<sup>117</sup> was a companion to a previous study<sup>116</sup> as it incorporated the findings of the initial survey and utilization from a resampling of new subjects 6 years later.

## **Massage Utilization Within the U.S.**

Three of the 12 eligible U.S. publications used cross-sectional study designs based on interviews.<sup>9,12,18</sup> Two studies were based on retrospective health claims database review<sup>16</sup> or chart review.<sup>33</sup> Another study<sup>9</sup> was designed as a single group prospective study but presented only baseline data for the subgroup of chronic pain patients and as such the results are cross-sectional. The remaining seven publications established CAM utilization using a single group prospective design based on telephone interviews,<sup>15,30,44</sup> self-administered questionnaires,<sup>11</sup> and health record audit with administrative billing records.<sup>20,22,23</sup>

The majority of populations were from specialized clinical practices or from the practices of licensed CAM providers. Three publications reported CAM utilization based on subjects from either a national sample,<sup>12</sup> or regional samples from North Carolina.<sup>9,30</sup> Two publications recruited subjects from health claims databases in Washington state,<sup>16,18</sup> and three from family medical and chiropractic practices in Oregon state.<sup>20,22,23</sup> Similarly, two publications<sup>15,44</sup> randomly sampled licensed massage therapists and patients within their practices from the states

of Washington and Connecticut. One study<sup>33</sup> recruited patient charts from chiropractic practices within California and another study recruited subjects from large urban specialty clinics for orthopedic or neurosurgery consultation.<sup>11</sup>

Utilization was primarily defined as a visit with a CAM practitioner, having received or “ever tried” massage, or use from a health claims database or health record from a CAM practitioner. Persons with back pain were asked about use of CAM within the last 12 months,<sup>9,10,12,20,22,23</sup> lifetime use,<sup>11,18</sup> or visits to practitioner over a 1-year interval.<sup>15,16,33,44</sup>

Two publications<sup>16,20</sup> using data from large health claims databases showed low rates of massage utilization for LBP, varying from 4 to 5 percent of the total sample. One study<sup>12</sup> reported massage use for patients with combined neck and back pain and showed a utilization rate of 14.1 (95 percent CI, 10.8-17.4), an estimated 32.8 million visits (mean of 5.4 visits). In contrast, publications that evaluated use of massage within smaller samples, showed rates of use varying from 16 to 52 percent.

Only one publication<sup>15</sup> provided any detail as to the type of massage administered to back pain patients. This publication also reported the mean duration of the visits as 60 minutes. The training or type of massage therapist was specified as a “licensed massage therapist”,<sup>15,18,44</sup> provided within a chiropractor practice and thus likely provide by a chiropractor,<sup>20,22,23,33</sup> or provided within a physical therapy practice thus possibly from a physical therapist.<sup>30</sup> The remaining four publications<sup>9,11,12,16</sup> provided no details regarding the massage practitioner.

**Massage utilization based on anatomical region.** Tables 8A to 11B indicate the number of publications specific to regions of the back and these include: one study evaluating massage utilization for neck pain,<sup>44</sup> two for unspecified back pain,<sup>15,44</sup> nine for LBP,<sup>9,11,16,18,20,22,23,30,33</sup> and one study<sup>12</sup> that combined back and neck pain. A single study<sup>44</sup> evaluating patients in licensed massage therapist practices found rates of use of massage for neck pain to vary between 13 and 20 percent for the states of Connecticut and Washington (combined 17 percent). This same study found slightly higher rates of massage use for unspecified back pain at 20 percent for both states.

The majority of publications<sup>9,11,16,18,20,22,23,30</sup> reported on massage use in persons with LBP and all of these publications evaluated chronic LBP, except two<sup>20,30</sup> which had combined acute and chronic groups. Two publications<sup>16,20</sup> using data from large health claims databases showed low rates of utilization, varying from 4 to 5 percent of the total sample. In contrast, publications that evaluated use of massage within smaller samples with chronic back pain, showed rates of use varying from 24 to 52 percent. One study<sup>12</sup> reported massage use for patients with combined neck and back pain also reported no difference in the relative frequency of massage use by location of the back pain.

**Massage use as complementary care or combined with other CAM therapies.** The majority of publications did not collect or report sufficient information to determine use of complementary or other CAM therapies specific to patients receiving massage. There was one exception<sup>15</sup> and this study indicated that massage was used predominately with movement re-education and less frequently with energetic work, and reflexology.

Two publications reported use with other CAM therapies but were not specific to those respondents with back pain<sup>44</sup> or specific to those receiving massage.<sup>12</sup> Although not stratified by back pain, up to 29 percent of subjects receiving massage saw a medical or osteopathic physician.<sup>44</sup> Another study<sup>12</sup> suggested that CAM alone had been used by 25 percent of persons with back and neck pain; however, this was not specific to those receiving massage.

**Quality assessment for U.S. massage publications.** Three of the 12 eligible U.S. publications used cross-sectional study designs based on interviews.<sup>9,12,18</sup> One publication<sup>12</sup> was based on a randomly sampled population cohort with adequate response rate while another<sup>18</sup> obtained a low response rate (36 percent) creating the potential for selection bias. Another study recruited subjects from North Carolina, and reported baseline data for subjects with chronic back pain<sup>9</sup> or acute back pain.<sup>30</sup> Four publications used retrospective administrative database information and employed methods to standardize coding for back pain classification, provider visits, and treatments; one was based on a large health plan database<sup>16</sup> and the others from chiropractic practices across a state.<sup>20,22,23</sup> There is greater potential for selection bias in studies stemming from samples obtained from provider clinics. Two related publications<sup>15,44</sup> randomly sampled licensed massage therapists and patients within their practices but was essentially a single group prospective design. The remaining studies employed single group prospective designs from specialized settings.<sup>11,33</sup> There is significant overlap with the studies included for acupuncture. These studies evaluating the use of massage within the U.S. are prone to some biases but these do not negate the validity of the results; the overall quality is rated as fair for these studies.

**Summary of use for back pain in U.S. massage publications.** Twelve U.S. publications evaluated the use of massage in persons with back pain. The majority of populations were from specialized clinical practices of back pain patients or CAM providers. Two publications<sup>16,20</sup> using data from large health claims databases showed low rates of utilization, varying from 4 to 5 percent of the total sample. One study with a population based sample<sup>12</sup> reported massage use for patients with combined neck and back pain as 14.1 percent (95 percent CI, 10.8-17.4). Publications that evaluated use of massage in smaller samples, showed rates of use varying from 17 to 52 percent. The timeframe of reported use was 1 year, with the exception of two studies evaluating lifetime use.<sup>11,18</sup> Only one of the publications,<sup>15</sup> provided any detail as to the type of massage administered to back pain patients.

From 11 publications, the majority reported on low back problems (n = 9) and mostly for chronic pain; only one study<sup>44</sup> reported on utilization of massage in neck pain. A single publication<sup>12</sup> reported no difference in the relative frequency of massage use by location of the back pain.

Most publications did not collect or report sufficient information to determine use of complementary or other CAM therapies by patients receiving massage. There was one exception<sup>15</sup> and this study indicated that massage was used predominately with movement re-education and less frequently with energetic work, and reflexology. Although several studies indicated that massage was used in combination with other CAM therapies, none indicated which other therapies were combined with massage.

## Massage Utilization Outside the United States

From the eight publications undertaken outside of the U.S., four were from Canada,<sup>116-118,131</sup> two from the Netherlands,<sup>121,130</sup> one from Germany,<sup>51</sup> and one from Australia.<sup>119</sup> All the publications undertaken within Canada were cross-sectional design from randomly selected samples, predominately at a national level; all but one study<sup>131</sup> was undertaken by telephone interview. The Australian study<sup>119</sup> was also a population-based cross-sectional study using self-administered questionnaire. The two Dutch publications were both based on a single group prospective questionnaire completed by subjects selected from general medical practices<sup>130</sup> and

from a retrospective analysis of an administrative database for physical therapy.<sup>121</sup> Similarly, the study from Germany<sup>51</sup> interviewed a single group prospective cohort from general practices.

Utilization of massage therapy was primarily defined as a visit with a CAM practitioner, or use as indicated in a health claims database. All subjects were asked about use of CAM within the last 12 months with the exception of three publications, which evaluated use within the last 6 months,<sup>119</sup> past 4 weeks,<sup>131</sup> or lifetime use.<sup>130</sup>

Five publications<sup>116-119,131</sup> were cross-sectional in design recruiting randomly selected national or provincial samples. In these studies utilization rates varied from 7 percent<sup>131</sup> within the past 4 weeks to 42 percent lifetime use.<sup>116</sup> Generally, studies of single group prospective design showed higher rates of utilization from 56 percent from an administrative database<sup>121</sup> to 30 percent.<sup>51</sup> The exception to this was a single study that evaluated massage use in persons with neck pain reporting a 7 percent rate of use at baseline.<sup>130</sup>

None of the publications provided detail as to the specific type of massage received by persons with back pain. The providers of massage were physical therapists in one publication,<sup>121</sup> massage therapist in another,<sup>119</sup> and were not specified in the remaining publications.

**Massage utilization based on anatomical region.** A single non-U.S. study<sup>130</sup> found that utilization specific to the neck and the use of massage was 7 percent. A single study<sup>118</sup> evaluating unspecified back pain reported a rate of 55.5 percent (95 percent CI< 54.1-57.0) for massage use. Similarly, the three publications<sup>51,119,121</sup> evaluating LBP reported high rates of use that varied from 15 to 56 percent. Three publications<sup>116,117,131</sup> evaluated rates of massage use reported for neck and back pain combined; in one study<sup>131</sup> 7 percent of respondents saw massage therapist. In the other two publications 39 to 42 percent received massage.<sup>116,117</sup>

**Massage use as complementary care or combined with other CAM therapies.** Of the five publications providing some information regarding conventional care with CAM, three<sup>116-118</sup> had not stratified the proportions specific to persons reporting back pain and one did not stratify by practitioner type.<sup>119</sup> A single study<sup>131</sup> indicated that 4 percent of combined neck and back patients saw a medical doctor and a massage therapist; similarly, 3 percent saw a medical doctor, a chiropractor, a physiotherapist and a massage therapist.<sup>131</sup>

The majority of publications did not provide detail regarding concurrent or additional use of other CAM therapies with massage, specific to persons with back pain and stratified by therapy. In one study<sup>51</sup> 37 percent of patients receiving massage, also received acupuncture concurrently. Similarly, one study<sup>131</sup> reported concurrent use of massage and chiropractic in 5 percent of the sample. Another study<sup>130</sup> of persons with neck pain indicated that up to 12 percent of patients used other CAM therapies, including Reiki, energy healing, and acupuncture.

**Quality assessment for non-U.S. massage publications.** Five publications<sup>116-119,131</sup> were cross-sectional in design recruiting randomly selected national or provincial samples; although derived from large samples, the response rates were relatively low varying from 19 to 69 percent. The survey methodology employed within these studies was of high quality, using pre-tested questionnaires. Three studies employed single group prospective design with subjects recruited from general medical practices<sup>51,130</sup> or from an administrative database for physical therapy;<sup>121</sup> one of these<sup>130</sup> recruited a small sample relative to the other studies. The overall quality of these studies would be rated as fair.

**Summary of use for back pain for non-U.S. massage publications.** Of the eight publications undertaken outside of the U.S., four were from Canada,<sup>116-118,131</sup> two from the Netherlands,<sup>121,130</sup> one from Germany,<sup>51</sup> and one from Australia.<sup>119</sup> Five publications<sup>116-119,131</sup> were cross-sectional in design recruiting randomly selected national or provincial samples.



Within these studies utilization rates varied from 7 percent<sup>131</sup> for seeing a massage therapist within the past 4 weeks to 42 percent for lifetime use.<sup>116</sup> Generally, studies of single group prospective design showed higher rates from 56 percent from an administrative database<sup>121</sup> to 30 percent.<sup>51</sup> The exception to this was a single study that evaluated massage use in persons with neck pain which reported a 7 percent rate of use at baseline.<sup>130</sup>

All but one publication<sup>130</sup> queried the use of massage within 12 months or less (as recent as 4 weeks). None of the publications provided detail as to the specific type of massage received by persons with back pain, or the type of provider.

The sole study evaluating neck pain<sup>130</sup> reported a rate of 7 percent utilization. Rates of use for LBP or combined neck and back pain were generally higher, varying from 15 (6-month use) to 42 percent (lifetime use). Based on this single study for neck pain, it is difficult to establish whether or not the rate of massage use varies based on anatomical location.

While five publications provided some information regarding conventional care with CAM, four of these did not present results stratified by back pain or practitioner. A single study<sup>131</sup> indicated that 4 percent of combined neck and back patients receiving massage also saw an M.D. concurrently; similarly, 3 percent saw an M.D., a chiropractor, and a physiotherapist in addition to a massage therapist.<sup>131</sup> Only three studies reported on concurrent use of massage with other CAM therapies such as acupuncture<sup>51</sup> (37 percent), chiropractic<sup>131</sup> (5 percent), or mixed therapies<sup>130</sup> (12 percent receiving either Reiki, energy healing, and acupuncture).

## Specific CAM Therapy Utilization: Chiropractic/Spinal Manipulation

We retrieved the full text of 52 articles that potentially provided information on utilization of chiropractic/spinal manipulative therapy for back pain. One publication<sup>83</sup> is not summarized below, as this study included comparison data from three other publications already included. Of the 51 remaining publications, 31 were undertaken solely within the U.S., 15 in other eligible countries, and five included both U.S. and Canadian data. Although, one of the publications<sup>25</sup> with U.S. and Canadian data did not stratify results by country, we classified this as U.S. as the majority of data was not Canadian.

**Chiropractic/Spinal manipulation utilization within the U.S.** Thirty-six publications on chiropractic and spinal manipulation, were undertaken in the U.S. The study design varied and included 15 single group prospective cohort study publications,<sup>11,15,17,20,22-25,27,30,34,38,41,43,44</sup> 10 retrospective reviews of patient records or claims data,<sup>16,21,28,32,33,36,37,39,40,42</sup> and 10 cross-sectional publications.<sup>9,12-14,18,19,26,29,31,35</sup> One study was a randomized controlled trial.<sup>10</sup>

The majority (n = 24) focused on LBP.<sup>9,11,16-24,27,28,30-33,35,37-42</sup> Three publications presented information on neck pain,<sup>25,40,44</sup> one the thoracic spine,<sup>40</sup> six on combined spinal sites<sup>12-14,26,36,39</sup> and seven unspecified back region.<sup>10,15,25,29,34,38,44</sup> Sixteen of 24 publications on LBP and the one study of neck pain provided details on the duration of patients' complaints. Twelve of the publications reported on chronic complaints,<sup>9,11,18,21,22,24,27,28,31,37,41,42</sup> three on acute pain,<sup>19,20,30</sup> and two on a range of duration.<sup>20,33</sup>

Chiropractors were the providers of spinal manipulative therapy in 34 of the publications,<sup>9-29,31-34,36-44</sup> and physiotherapists in the remaining two.<sup>30,35</sup>

Details on the type of spinal manipulation was provided in three publications;<sup>15,24,33</sup> one clarified that 75 percent of manual therapy provided was "manual, high-velocity, low-amplitude manipulation",<sup>24</sup> and one defined the manual therapy provided as "specific, short-lever dynamic

thrusts (or spinal adjustments) or non-specific, long-lever manipulation".<sup>33</sup> The study by Sherman et al.,<sup>15</sup> noted that the predominant manipulation provided was of the diversified type.

Eligible U.S. trials on LBP populations found that rates of attending for chiropractic/spinal manipulative therapy ranged from 10 to 47 percent.<sup>9,11,18,19,28,30,32,35,41</sup> Between 79 and 94 percent of treatments provided by chiropractors included spinal manipulative therapy.<sup>9,11,22,23,28,33,37</sup> In two studies in which physiotherapists were the treatment providers, 21 to 34 percent of patients with LBP were treated with spinal manipulative therapy either in isolation or with other modalities.<sup>30,35</sup> The number of visits for chiropractic care or other providers of spinal manipulative therapy ranged from a mean of 4.3 to 15.7<sup>9,19,22-24,28,33</sup> with the exception of one study of disability claimants who attended for an average of 41 visits,<sup>37</sup> and a median of 4 to 7<sup>16,28</sup> (Tables 12A to 16B). In one study in which the mean and median number of visits was provided, the mean was approximately double the median.<sup>28</sup> In one study in which two similar cohorts of adults with LBP were surveyed 10 years apart, the rates of chiropractic utilization declined by 10 percent between 1987 (40 percent) and 1997 (31 percent).<sup>19</sup>

**Chiropractic/spinal manipulation utilization based on anatomical region.** A single study<sup>40</sup> provided rates per 1,000 members episodes of care for all three spinal regions and showed a gradient with the thoracic spine being the region for which there was lowest use (10 to 20 percent), the neck, the second most common region (31 to 45 percent), and the low back, the most frequent region receiving chiropractic care (58 to 64 percent). A second study<sup>44</sup> reported rates of use for two spinal regions and showed lower rates for the neck (23 to 25 percent) relative to unspecified back (41 to 44 percent). A third study<sup>25</sup> showed a similar gradient for neck pain (17 percent for all subjects and 9 percent for those aged over 55 years) and unspecified back pain (38 percent for all subjects and 33 percent for those aged over 55 years).

**Chiropractic/spinal manipulation use as complementary care or combined with other CAM therapies.** Only two of the 36 eligible U.S. trials provided detailed information on patterns of care seeking; the majority of publications did not present complementary use stratified by persons with back pain. Use of chiropractic care as an alternative to conventional care ranged from 4 to 33 percent and use of chiropractic as complementary therapy ranged from 13 to 16 percent.<sup>16,17</sup> One study<sup>16</sup> explored the care seeking patterns of 104,358 Washington State residents who made a claim for LBP and found that 45 percent sought conventional care only (M.D. or PT), 33 percent sought chiropractic care only, 13 percent sought other CAM providers only (aside from chiropractors), and 12 percent pursued both conventional and CAM providers. Another study<sup>34,43</sup> found that one-third of patients with unspecified back pain chose to attend a chiropractor, that chiropractors were the primary provider (defined as the provider who delivered the majority of care) for 40 percent of episodes of back pain, and that 92 percent of chiropractors' patients chose their services again for future episodes of back pain (Table 13A).

Although many authors described treatments provided to patients with back pain, only one study<sup>35</sup> provided details on how spinal manipulative therapy is combined with other modalities (Table 14A). Of 2,328 American patients discharged from physiotherapy outpatient services 34 percent received spinal manipulative therapy either in isolation or with other therapy, 10 percent received spinal manipulative therapy with exercises and physiotherapy modalities, and 8 percent received spinal manipulative therapy and exercises.

**Quality assessment for U.S. chiropractic/spinal manipulation publications.** From 36 publications, 10 cross-sectional studies are based predominately on random samples,<sup>9,12,14,26,31</sup> systematic samples,<sup>13,18,29</sup> national probability samples,<sup>19</sup> or not reported.<sup>35</sup> Response rates varied from 36 to 95 percent; the methods of the surveys and interviews were generally of high quality.

There are 15 single-group prospective cohort study publications;<sup>11,15,17,20,22-25,27,30,34,38,41,43,44</sup> two of these<sup>15,44</sup> employed a random sampling of chiropractors. The majority of these papers recruited samples from chiropractic or other professional clinical practices, and as such represent selective groups of patients. From 10 retrospective publications, four were based on patient health records,<sup>21,28,33,42</sup> two were from large administrative health databases,<sup>16,40</sup> and four from workers' compensation databases,<sup>32,36,37,39</sup> the latter using standardized coding for back injury diagnosis and utilization. Overall, the quality of these studies would be evaluated as fair, noting that biases are present but not sufficient to negate the validity of results.

**Summary of utilization in U.S. chiropractic/spinal manipulation publications.** Thirty-six publications<sup>9-44</sup> on chiropractic and spinal manipulation, were undertaken in the U.S. The majority (n = 24) reported on LBP and the fewest on neck (n = 3) and thoracic spine (n = 1). Our review suggests that chiropractic care/spinal manipulation is commonly sought by patients with back pain. From 10 cross-sectional studies<sup>9,12-14,18,19,26,29,31,35</sup> based predominately on random or systematic samples, rates of utilization varied from 16 percent<sup>14</sup> to 45 percent.<sup>18</sup> Eligible U.S. trials on LBP populations found that rates of attending for chiropractic/spinal manipulative therapy range from 10 to 47 percent.<sup>9,11,18,19,28,30,32,35,41</sup> The number of visits for chiropractic care or other providers of spinal manipulative therapy ranged from a mean of 4.3 to 15.7.<sup>9,19,22-24,28,33</sup> Between 79 percent and 94 percent of treatment by chiropractors included spinal manipulative therapy.<sup>9,11,22,23,28,33,37</sup> Two studies provided some evidence for a gradient of use based on anatomical regions; LBP was treated most often,<sup>25,40,44</sup> followed by neck, and then thoracic pain.<sup>40</sup>

Chiropractors were the providers of spinal manipulative therapy in most publications (n = 34), and physiotherapists in two publications.<sup>30,35</sup> Details on the type of spinal manipulation provided was provided in three only publications.<sup>15,24,33</sup>

The available information suggests that roughly equal proportions of LBP patients use chiropractic as complementary to conventional care and as an alternate. Current literature provides little insight into the manner in which chiropractic/spinal manipulation is combined with other therapies for back pain. Despite the common use of chiropractic/spinal manipulation by patients with back pain the current literature provides limited data on utilization.

**Chiropractic/spinal manipulation utilization in non-U.S. publications.** Nineteen publications<sup>14,21,28,42,116-119,122,124,126,128,129,131-136</sup> on the utilization of chiropractic and spinal manipulation, were undertaken within other eligible countries. The majority of these publications (n = 11) focused on LBP.<sup>21,28,42,119,122,124,128,129,132-134</sup> Three publications presented information on neck pain,<sup>124,134,135</sup> one on the thoracic spine,<sup>134</sup> three on combined spinal sites,<sup>116,117,131</sup> and three on unspecified back regions.<sup>118,126,136</sup>

Study designs varied and included two single-group prospective cohort study publications,<sup>122,126</sup> five retrospective reviews of patient records or claims data,<sup>21,28,42,132,135</sup> one study that used both patient records and single-group prospective cohort data,<sup>129</sup> and 11 cross-sectional publications.<sup>14,116-119,124,128,131,133,134,136</sup> Four publications did not provide information on duration of pain.<sup>14,118,122,136</sup> Ten studies evaluated chronic pain (greater than 3 months) in the back,<sup>126</sup> combined back and neck,<sup>116,117,131</sup> and the low back.<sup>21,28,42,119,128,133</sup> Three studies evaluated acute pain in acute whiplash (less than 30 days),<sup>135</sup> in the LB for pain greater than 24 hours,<sup>132</sup> and less than 6 weeks.<sup>129</sup> Two studies evaluated mixed duration populations.<sup>124,134</sup>

Chiropractors were the providers of spinal manipulative therapy in 14 of the publications,<sup>14,21,28,42,116-119,124,126,131,133-135</sup> physiotherapists in one study,<sup>132</sup> osteopathic doctors in one study,<sup>122</sup> chiropractors and osteopaths in two publications,<sup>128,136</sup> and osteopathic doctors,

chiropractors and physiotherapists in one study.<sup>129</sup> Details on the type of spinal manipulation was provided in one study;<sup>122</sup> this study noted provision of osteopathic manipulation defined as “passive articulation of the lumbar spine and high-velocity thrust techniques”.<sup>122</sup>

The study that reported on neck pain (specifically, acute whiplash) found that 18 percent of respondents sought chiropractic care.<sup>135</sup> Eligible trials on LBP populations found that rates of attending for chiropractic/spinal manipulative therapy ranged from 11 to 40 percent.<sup>119,128,133</sup> One publication reported that 81 percent of treatment by chiropractors included spinal manipulative therapy.<sup>28</sup> In the single study in which physiotherapists were the treatment providers, 3 percent of patients with LBP were treated with spinal manipulative therapy.<sup>132</sup> A single study reported the average number of visits for chiropractic care was 10.5 and the median was six.<sup>28</sup> A national survey found that overall use of chiropractic services among Canadians increased from 36 percent in 1997 to 40 percent in 2006.<sup>116,117</sup>

**Chiropractic/spinal manipulation use based on anatomical region.** A single study<sup>134</sup> evaluated back pain in three regions and showed a gradient from the least utilization for the thorax (7 percent), to the neck (9 percent) and the low back (40 percent). One study<sup>124</sup> showed lower rates of use for neck pain (24 to 25 percent) than for unspecified back pain (71 to 74 percent).

**Chiropractic/spinal manipulation used as complementary care or combined with other CAM therapies.** Of the 19 eligible non-U.S. publications, the five that provided information on patterns of care-seeking all showed that chiropractic care is used both as a complementary therapy and an alternative to conventional care, often in similar proportions.<sup>119,128,131,135,136</sup> The proportion of patients with back pain that attended a chiropractor in isolation ranged from 6 to 29 percent, and use of chiropractic as a complementary therapy ranged from 2 to 36 percent.

**Quality assessment for chiropractic/spinal manipulation.** Of 19 publications, 11 were cross-sectional publications.<sup>14,116-119,124,128,131,133,134,136</sup> Two studies did not report response rates<sup>118,134</sup> while the remaining studies reported rates from 19 to 100 percent. All but two studies<sup>124,134</sup> recruited random samples from the general population. In addition, these two studies did not report the method of questionnaire development. For the remaining eight publications, study design varied and included two single-group prospective cohort study publications,<sup>122,126</sup> one study that used both patient records and single-group prospective cohort data,<sup>129</sup> and five retrospective reviews of patient records or claims data.<sup>21,28,42,132,135</sup> All of the retrospective database studies obtained data from practitioner sources, and one study<sup>135</sup> also used insurance claim source from persons following a motor vehicle accident. These studies recruited from select back pain patient groups. Overall, the quality of these studies was rated as fair.

**Summary of utilization in non-U.S. chiropractic/spinal publications.** Nineteen publications<sup>14,21,28,42,116-119,122,124,126,128,129,131-136</sup> on the utilization of chiropractic and spinal manipulation, were undertaken in other eligible countries. The majority of these publications (n = 11) focused on LBP.<sup>21,28,42,119,122,124,128,129,132-134</sup>

Chiropractors were the providers of spinal manipulative therapy in most publications (14 of 19), with other providers included physiotherapists or osteopathic doctors. Only one study provided details on the type of spinal manipulation used.<sup>122</sup>

One study reported use for acute whiplash neck pain at 18 percent.<sup>135</sup> Eligible trials on LBP populations found that rates of attending for chiropractic/spinal manipulative therapy ranged from 11 to 40 percent.<sup>119,128,133</sup> A single trial reported that 81 percent of treatment by chiropractors included spinal manipulative therapy.<sup>28</sup> A national survey found that overall use of chiropractic services among Canadians increased from 36 percent in 1997 to 40 percent in

2006.<sup>116,117</sup> Two studies showed some evidence of lower rates of use for neck/thoracic pain relative to the LBP.<sup>124,134</sup> Only 5 publications provided information on use as complementary or combined care. The proportion of patients with back pain that attended a chiropractor in isolation ranged from 6 to 29 percent, and use of chiropractic as a complementary therapy ranged from 2 to 36 percent.

## **Specific CAM Therapy Utilization: Naturopathic Medicine and Related Interventions**

We identified eight publications examining the utilization of naturopathic medicine and other related CAM therapies. Five of these<sup>10,12,16,44,137</sup> were undertaken in the U.S. and three<sup>118-120</sup> in other eligible countries. These papers were published between 2002 and 2007 and included 184,907 participants aged 15 to over 90.

**Naturopathic medicine utilization within the U.S.** There were three publications from the U.S that clearly examined naturopathic medicine utilization. Of these, two were single group prospective study designs<sup>44,137</sup> where data was collected through a self-administered questionnaire,<sup>44</sup> or a telephone interview.<sup>137</sup> One study was a retrospective review<sup>16</sup> of an administrative database. Two publications sampled practitioners<sup>44,137</sup> and one study extracted data from a health insurance plan database.<sup>16</sup> All publications defined the utilization of CAM (of which naturopathic medicine was a subset) as ‘a visit to a practitioner’.

One study<sup>44</sup> found that approximately 5 percent of patients with LBP saw a naturopathic doctor (ND) in Connecticut and Washington states in 1998 and 1999. A reanalysis of this study undertaken for back and neck pain,<sup>137</sup> found that licensed NDs provided a wide variety of interventions for patients with these conditions. However, the frequency of use of the differing ND treatment modalities was not reported specifically for patients with back or neck pain. In the reanalysis, it was reported that 4 to 7 percent of visits to NDs were primarily due to symptoms diagnosed as back problems (Table 17A). Similarly, 2 to 3 percent of patients who visited NDs presented with neck problems as the primary complaint or symptom. A third study,<sup>16</sup> unrelated to the previous two, indicated that 2 percent of patients visited an ND at least once in the previous year (2002) for back pain (mean visits = 2). Only 1 percent of people with back pain visited only an ND.<sup>16</sup>

**Naturopathic medicine utilization outside of the U.S.** One study with a cross-sectional design was conducted on the general Australian population in 2001<sup>119</sup> and found that for those with LBP, approximately 3 percent had visited an ND in the past 6 months. No specifics regarding naturopathic treatments were reported in the study. It should be noted that the educational and licensing requirements for NDs in North America and Australia are drastically different, the former mimicking M.D. training in primary care very closely.

No data were reported on the usual costs for these therapies per treatment or for the prescribed course of treatments suggested. These data are insufficient to make any conclusions regarding the utilization of NDs for those with back pain. More research is needed.

## **Dietary Supplements and Homeopathy Utilization Within the United States**

This section focuses on those publications that assessed the utilization of CAM related to the use of dietary supplements and homeopathy for back pain. These interventions are often

suggested and delivered by NDs but not all of these papers specifically mentioned that that was the case.

One study was cross-sectional<sup>12</sup> and used a telephone interview and one study was an RCT<sup>10</sup> that collected data with a self-administered questionnaire. Both publications sampled the general population in the U.S. and defined utilization of dietary supplements and homeopathy as ‘ever having tried’ (Tables 18A and 18B).

The RCT<sup>10</sup> compared an email discussion group behavioral intervention for LBP with usual care over a one year period. At baseline, 46 percent of the intervention group reported having ‘ever tried’ glucosamine compared to 26 percent in the control group. Thirteen percent of the intervention group and 8 percent of the control group reported trying glucosamine during the last 6 months of the study.

Wolsko<sup>12</sup> in a national survey of back and neck pain from 1997 to 1998, found that those suffering from any back and or neck pain used the following CAM therapies over the preceding 12 months: 3 percent used homeopathy; 2 percent used vitamins, 1 percent used herbal medicines, and 1 percent used a special diet.

## **Dietary Supplements and Homeopathy Utilization Outside the United States**

Two Canadian publications sampling the general population, used cross-sectional designs to collect information on CAM use via telephone interview<sup>118</sup> and face-to-face interview (Tables 19A and 19B).<sup>120</sup> One study found that of the patients with chronic back pain (n = 3259), 39 percent had used a CAM therapy (massage, acupuncture, homeopathy, relaxation, reflexotherapy, or spiritual therapy) in the last year, 18 percent had used homeopathy and 6 percent had used herbal medicine.<sup>118</sup> Another Canadian study<sup>120</sup> looking at glucosamine use over a 5 year period (1997 to 2002) found that 5 percent of men and 10 percent of women had used glucosamine at some point for back pain. No data were reported on the usual costs for these therapies per treatment or the prescribed course of treatments suggested.

## **Other CAM Therapies Based on Self-Care**

Three publications focused on the use of single CAM therapies that are generally self-administered, including yoga,<sup>138</sup> prayer,<sup>139</sup> and mind body therapies.<sup>140</sup> All three of these publications were subgroup analyses from a larger population-based survey undertaken in 1998.<sup>5</sup> All evaluated both lifetime use and use within the last 12 months. Utilization reported in these studies was limited to the proportion of the sample who used these therapies and had neck or back pain.

Forty-two percent (standard deviation (SD) 4.5 percent) of those participating in yoga had back or neck pain; the concurrent or lifetime use of other CAM therapies for persons using yoga was not stratified by back pain. Prayer was used by 18 percent of persons with back or neck pain and 59 percent of these found it to be very helpful; 40 percent of these patients also saw a physician for their condition.<sup>139</sup> Approximately 18 percent (standard error (SE) 2.6) of persons with back or neck pain also used mind body therapy within the last 12 months and 40 percent (SE 8.2) found this to be very helpful for their condition; mind body therapy can include relaxation techniques such as meditation, stress response, guided imagery, and biofeedback.<sup>140</sup>

The specific types of mind-body therapies used by persons with back or neck pain were not identified.

## Assessment of Quality of Utilization Publications

Given the degree of overlap of studies among the differing CAM therapies, we thought it useful to summarize quality for all the studies reporting utilization of any CAM therapy. As noted previously, single group cohort study designs are prone to a variety of biases and do not have specified criteria to assess methodological quality.

### Quality of Utilization Publications Undertaken Within the United States

A total of 46 publications on CAM utilization were from the U.S. Of these, 10 were based on retrospective patient records or claims data<sup>16,21,28,32,33,36,37,39,40,42</sup> and 15 were cross-sectional publications.<sup>5,9,12-14,18,19,26,29,31,35,45,138-140</sup> A single publication was based on an RCT.<sup>10</sup> The remaining publications were single group cohort publications, for which quality was not assessed.

Of the publications based on retrospective health database or chart records, three were from large workers' compensation claims databases<sup>36,37,39</sup> where the primary interest was in chiropractic visits. Three publications<sup>16,32,40</sup> were from large health insurance claims or managed care network databases. All of these publications have standardized coding for classifying back pain (predominately ICD 9 codes), provider visits, and enrollee characteristics and treatments; given the pre-specified coding systems, linkages between elements within the database were likely limited in errors. Four publications used health record extraction from chiropractic charts;<sup>21,28,33,42</sup> and standardized data collection forms were used.

All the U.S. cross-sectional publications used self-report methods of ascertaining utilization of CAM. Table 20 details these publications with respect to sampling strategy, response rate, mode of administration of the survey, questionnaire design (which we operationalized as pre-testing of questions) and the time frame for recall. Several publications were related to a single national survey,<sup>5,12,138-140</sup> and two to residents of North Carolina.<sup>9,31</sup> Response rates varied from 95 to 60 percent and all but one<sup>5</sup> would be considered acceptable; an acceptable response rate is from 65 to 75 percent.<sup>84</sup> Recall periods were 6 or 12 months, with the exception of two papers<sup>29,35</sup> that collected current episode or the past 2 weeks. The majority of publications used telephone or in person interviews suggesting less potential for bias. Limited information about questionnaire design was provided.

### Quality of Utilization Publications Undertaken in Other Countries

A total of 22 publications were undertaken within eligible countries outside the U.S. with an additional four overlapping with U.S. data.<sup>14,21,28,42</sup> Of these, eight<sup>21,28,42,121,125,129,132,135</sup> were based on retrospective patient record or claims data and 14 were cross-sectional publications.<sup>14,116-120,123,124,127,128,131,133,134,136</sup> The remaining four publications were single group cohort publications, for which quality was not assessed.<sup>51,122,126,130</sup>

Among the publications from retrospective health database or chart records, one study<sup>135</sup> used claims from a provincial insurance database for persons with whiplash. Others used, patient health records from physiotherapy practices,<sup>121,132</sup> a pain clinic<sup>125</sup> and chiropractic practices.<sup>21,28,42,129</sup> It was not clear in all of these publications if standardized forms were used to collect utilization information.

The 14 cross-sectional publications all used self-report methods of ascertaining utilization of CAM. Table 21 shows these publications and their quality characteristics. Four of these publications<sup>116-118,133</sup> were based in Canada and were undertaken at a national level using random sampling; similarly, two in Australia were nationally-based random sample surveys.<sup>119,127</sup> Three publications recruited patients from practitioner clinics.<sup>124,128,134</sup>

Response rates varied from 19 to 100 percent when reported. Recall periods included lifetime use,<sup>120</sup> 12 months,<sup>116-118,127,133</sup> 3 to 6 months,<sup>119,131,136</sup> 4 weeks,<sup>131</sup> and current episode.<sup>124,128,134</sup> Three publications<sup>127,128,133</sup> did not report the mode of data collection for utilization data. The remaining publications all used mailed questionnaires or telephone interviews with the exception of one study that used face-to-face interviews.<sup>120</sup> Limited information about questionnaire design was provided.

## Question 2. What is the Utilization Recommended by Different Types of Healthcare Providers?

To address this question we searched primarily for relevant U.S. based Clinical Practice Guidelines (CPG), and also publications that specified provider views on the recommended use of CAM therapies for patients with back pain.

### U.S. Clinical Practice Guidelines

We reviewed 19 U.S. CPG on neck or back pain. Of these, three were excluded as their target population was adults with spinal pain related to neurological conditions.<sup>141-143</sup> Four were excluded as they did not provide any recommendations for the use of CAM therapies for back pain.<sup>144-147</sup> A single publication<sup>148</sup> compared CPG from 11 different countries; this study was excluded as the U.S. guideline was developed in 1994.

Eleven guidelines related to the management of back pain included the use of CAM and the characteristics of these CPGs are detailed in Appendix C Table 1. Of these guidelines, three were published by professional organizations (acupuncture<sup>46</sup> and chiropractic organizations<sup>149,150</sup>), and three from payer organizations.<sup>151-153</sup> Only one CPG<sup>46</sup> made specific utilization recommendations for acute, subacute, chronic and recurrent flare-up patient conditions. The remaining 10 made general recommendations for using specific CAM therapies either by treatment type (n = 10), practitioner type (n = 2), or back region (n = 9) as follows:

*By treatment type including.* 1) Manipulation/Mobilization,<sup>149-152,154-158</sup> 2) Heat or Cold,<sup>154,155,157</sup> 3) Relaxation,<sup>155,156</sup> 4) Acupuncture/electro-acupuncture,<sup>46,153,156</sup> 5) Massage,<sup>151,156</sup> 6) Manual Therapy,<sup>152,158</sup> and 7) Yoga.<sup>156</sup>

*By practitioner.* 1) Chiropractor,<sup>151,152</sup> 2) Massage Therapist,<sup>151,152</sup> and 3) Manual Therapist.<sup>152</sup>

*By spinal region.* 1) Neck (none), 2) Neck/thorax,<sup>152,154</sup> 3) Thorax,<sup>151</sup> 4) Low back,<sup>149,151,155-157</sup> 5) Mixed back regions,<sup>46,150,158</sup> and 6) Back region not specified.<sup>153</sup>



For the single CPG<sup>46</sup> with utilization recommendations, the recommended frequency for electro-acupuncture was for two to three times weekly for a duration of 4 weeks for acute and subacute back pain and 6 to 8 weeks for chronic back pain and recurrent/flare-up, Appendix C Table 1. Although, these recommendations were not specific to either neck or back problems, the CPG was developed to apply to all these conditions. Although very similar in its recommendations, this guideline distinguishes between utilization with respect to initial course of treatment and a continuing course of treatment. The CPG recommends re-evaluation after 12 weeks of treatment irrespective of the duration of the condition. Two independent raters scored this CPG using the AGREE scoring instrument.(see Appendix C Table 2) For this guideline, stakeholder involvement scored 6 out of 12, applicability 8 out of 12, and rigor and development 25 out of 32. Based on the AGREE<sup>89</sup> score, this CPG would be acceptable with greater clarification and specifically a stronger link to the evidence for recommendations for utilization.

**Summary of recommended use of CAM therapies.** A single CPG, for electro-acupuncture, provided recommendations for the frequency of treatment that was stratified by duration, and recurrence. The guideline was developed from a provider organization and was acceptable based on the AGREE quality score.

## Provider Views About Recommended Use of CAM

Of the 22 publications that focused primarily on patient or provider views on CAM, 16 were excluded because they had no direct or indirect information on recommendations for CAM specific to back pain and in the context of optimal frequency and duration of utilization. Two publications<sup>47,48</sup> were U.S. and four<sup>49-52</sup> were from other eligible countries.

Of the two U.S. publications providing direct recommendations, one<sup>48</sup> did not provide information stratified for back pain. The other publication<sup>47</sup> recommended the type of CAM treatment for LBP in pregnancy and included heat/cold, yoga, and massage; no information on the utilization was provided. This recommendation was based on the views of American health care providers (physicians, nurses, midwives, prenatal educators).

Four non-U.S. publications provided some recommendations for the treatment of back pain; three of these were from the United Kingdom<sup>49,50,52</sup> and one from Germany.<sup>51</sup> Two of these publications<sup>51,52</sup> made recommendations primarily with regard to the type of CAM appropriate for managing back pain. CAM practitioners in the United Kingdom recommended the Bowen technique, chiropractic, magnet therapy, massage, reflexology and yoga for LBP and the Bowen technique, chiropractic and massage for neck pain.<sup>52</sup> The German publication<sup>51</sup> cautioned that receiving acupuncture for acute, recurrent or chronic LBP seemed to be a function of availability and did not offset the use of other health care resources. In fact, there were both increased consultation rates and use of other health care services after adjusting for key patient characteristics.

Two related publications undertaken in the United Kingdom based on a cross-sectional questionnaire<sup>49</sup> and a mixed methods design that included a qualitative component,<sup>50</sup> captured attitudes toward LBP and included opinions about recommended utilization. These publications helped to explain the practice patterns observed in three provider groups (chiropractors, osteopaths, and physiotherapists). Based on provider survey views, these publications found that osteopaths and physiotherapists endorsed limiting the number of treatment sessions more than chiropractors did. Additionally, those working in private practice did not endorse limiting the number of treatment sessions as frequently as those working in a national health service setting.

Those in private practice also endorsed a biomedical treatment oriented attitude advising their patient to be more vigilant and restrict activity versus a reactivation treatment orientation (items that concern return to work, daily activity and increasing mobility). These two publications would suggest that there may be moderating factors that influence the recommended use of CAM. These include availability of the CAM service, attitude of the practitioner (reactivation versus biomedical orientation) and a national health service versus private practice setting.

**Summary of provider views on utilization.** Six studies reported views on recommended use of CAM therapies. The two studies published in the U.S. did not stratify recommendations specifically for patients with back pain. Four publications from studies outside the U.S. provided some recommendations on use of CAM therapies specific to persons with back pain. None of the publications encompassing provider or patient views addressed recommendations with regards to the frequency or duration of treatment. These limited publications would suggest that the frequency of utilization may be influenced by the availability of the CAM service, attitudes of differing providers, the practice settings, and the type of CAM therapy.

### **Question 3. What are the Usual Costs for These Therapies per Treatment and for the Prescribed Course of Treatment?**

Our review identified 18 publications that were associated with costs or economic evaluations related to back pain and the use of CAM within the U.S. One study<sup>5</sup> provided information on costs and coverage for CAM therapies but did not present results stratified for back pain. Another study<sup>35</sup> evaluated the use of manual therapy applied by physical therapists but did not present costs in relation to the specific therapies applied. Of the remaining publications, two were based on the same patient population cohort<sup>53,54</sup> and two on the same health claims database.<sup>32,59</sup> Another study<sup>57</sup> incorporated data from three different publications and undertook an economic analysis of this combined data. Study characteristics and results are detailed in Appendix C Tables 3 and 4.

A variety of study designs were employed to collect cost related data including: retrospective analyses from administrative databases (n = 7),<sup>16,32,36,39,59-61</sup> single group prospective design (n = 5),<sup>20,34,53,54,57</sup> RCTs (n = 3),<sup>55,56,58</sup> and a case-control design.<sup>37</sup>

The majority of publications (n = 13) focused on costs associated with CAM services in persons with LBP.<sup>16,20,32,37,39,53-60</sup> From these LBP studies, four<sup>53-56</sup> included acute pain varying from greater than 7 days<sup>56</sup> to less than 10 weeks.<sup>53,54</sup> Four studies<sup>16,32,39,58</sup> did not specify the duration. Three studies evaluated chronic back pain described as recurrent,<sup>59</sup> chronic<sup>60</sup> or disabling.<sup>37</sup> Two studies combined chronic and acute back pain.<sup>20,57</sup> For the three studies that did not evaluate costs of CAM services in persons with LBP, two evaluated back pain location unspecified<sup>34,36</sup> and one combined neck and back pain;<sup>61</sup> none of these three studies identified the duration of the pain.

The source of payment for the CAM therapies used in these studies included private health insurance (n = 5),<sup>16,32,34,59,61</sup> workers' compensation insurance (n = 4),<sup>36,37,39,60</sup> and mixed sources including out of pocket (n = 4).<sup>20,53,54,57</sup> Three studies,<sup>55,56,58</sup> that were randomized trials, had the study or the participants insurance pay for treatments.

## Characteristics of Cost Evaluations for CAM Services

Fifteen of the 18 studies were not true economic analyses, but rather cost identification studies. A single study<sup>57</sup> undertook a complete cost-effectiveness analysis (CEA) for patients with LBP. The perspective of this analysis was from that of the payer. This CEA had some limitations, as data for complete cost estimates were only available for 38 percent of chronic and 50 percent of acute patients. In addition, this study did not assess actual use of services for referred patients, rather they imputed some costs. This approach was based on previously used methods for charges based on per claimant data and adjusted for proportion of provider charges that were actually reimbursed. It was not clear if this study<sup>57</sup> included the costs of adverse events related to visiting a chiropractor or M.D.. Although three studies<sup>53,55,56</sup> did provide health outcome change scores and costs, they did not estimate cost-effectiveness ratios; one of these studies<sup>56</sup> attempted to evaluate adverse events.

**Comparators to CAM provider costs.** Although selection of a comparator is not necessary in cost identification studies, all but two<sup>39,61</sup> undertook comparison of back treatment costs for CAM and non-CAM providers (Table 22). The overwhelming majority of studies (n = 13) evaluated chiropractors as the exclusive CAM provider.<sup>20,32,34,36,37,39,53-55,57-59,61</sup> One study<sup>56</sup> evaluated choice of a single alternative provider that may have included a chiropractor, acupuncturist, or massage therapist; another study<sup>16</sup> included any of four CAM providers (chiropractors, massage therapists, acupuncturists, or NDs) and another<sup>60</sup> may have included acupuncturists or massage therapists within the “other” category. Similarly, CAM provider costs were compared to a number of conventional practitioners including: M.D.s (n = 11 publications),<sup>16,20,32,34,36,37,53,54,56,59,60</sup> orthopedic surgeons or internists,<sup>53,54</sup> physical therapists,<sup>55,60</sup> combined M.D.s and physical therapists,<sup>58</sup> and “mixers” of both CAM and conventional providers.<sup>16</sup>

**Direct costs for CAM services.** The cost perspectives evaluated were predominately from that of the payer, and as such direct costs were collected. All studies included costs of visits to practitioners, but varied with respect to: a) inclusion of imaging or diagnostic tests, b) visits to specialists, c) back surgery costs and d) the use of medications. For studies with the workers’ compensation insurance as the payer, some included costs for lost days<sup>36,60</sup> and others excluded these.<sup>37,39</sup> Studies from other payers such as private insurance could have attributed lost days as indirect costs, but none evaluated these. The studies using health administration databases were prone to including costs associated with other illnesses, due to the manner of establishing an episode of care.<sup>32</sup>

The years for which costs were estimated varied significantly; these included cost estimates from a single study in 1982,<sup>34</sup> two from 1985,<sup>36,37</sup> five from 1995,<sup>20,53-55,57</sup> one from 2002,<sup>16</sup> and one from 2003.<sup>56</sup> Other studies used a range of years for cost estimates including: a) a two year interval from 1988-1990<sup>32,59</sup>, b) a four year interval from 1988-1992<sup>60</sup>, c) another from 1997-2001,<sup>61</sup> and d) from 1998 to 2002.<sup>60</sup> One study did not specify any year but estimated costs over an 18 month interval.<sup>58</sup> One study specified costs for each of the years between 1999 to 2002.<sup>39</sup> In general, half of the cost estimates were based on data over 12 to 25 years and only three studies reported costs within the last 5 years (Table 23).

A variety of cost measures were used including: a) total costs of care per episode per patient,<sup>20,34,36,39,53,56,60</sup> b) mean costs for index provider,<sup>54</sup> c) costs per unit visit,<sup>16,55</sup> mean costs over an interval of time,<sup>55,58,61</sup> percentage of total costs,<sup>37</sup> first episode versus multiple episodes costs,<sup>32</sup> and first and subsequent episode provider costs.<sup>59</sup> A single study estimated the

incremental cost effectiveness ratio for health outcomes of pain and disability reduction.<sup>57</sup> Appendix C Table 3 details the dollar values for each of these cost outcomes. Although costs do vary with differing providers, interpretation of these cost differences is problematic in the absence of links to health benefits or harms. There are also problems with the, often implicit, assumption that the effects of the providers and their treatments are equivalent.

**Indirect costs for CAM services.** The cost perspective for all studies was that of the payer, and as such direct costs were collected and indirect costs were either considered to be of less importance or were intentionally excluded.<sup>55</sup> No studies evaluated indirect costs with respect to time off work to attend therapy, or the costs associated with any adverse reactions from CAM therapy. The two studies in which the payer was workers' compensation insurance<sup>36,60</sup> included time off due to back pain as direct costs to the payer. Sick days taken for back pain in studies that estimated costs from other payers would not have captured these indirect costs to the patient or their employers.

**Quality of studies evaluating costs.** (Appendix C Table 4) A single study<sup>57</sup> undertook a formal CEA and methodological quality was evaluated using the Quality of Health Economic Studies (QHES).<sup>90</sup> This study scored low on criteria related to selection of perspective, specification of economic analyses, justification for these, and disclosing the source of funding for the study. The QHES could not be applied to the remaining studies as they were cost-identification evaluations and not true economic analyses. The limitations in the accuracy of cost estimates for publications using administrative databases<sup>16,32,36,39,59-61</sup> have been detailed previously. However, we noted that even those studies that employed RCT design, relied upon administrative health data for their cost estimates; as such these high level designs were also prone to the same potential confounding that results from using this source of cost data.<sup>56</sup>

**Impact of insurance coverage on costs for CAM services.** Three publications<sup>20,53,57</sup> were not based on samples entirely covered by insurance from private health organizations or workers' compensation. One study<sup>53</sup> indicated the proportion of persons with coverage for urban versus rural chiropractors and primary care providers, and orthopedic surgeons. Another study<sup>57</sup> reported the proportion of those covered by differing insurance carriers (or lack of coverage) as a function of provider type (chiropractor versus M.D.) and the duration of the LBP (acute versus chronic). The findings of this study would suggest that the duration does not affect the relative proportions of coverage for either chiropractor or M.D.. However, there was a greater proportion of patients who had no coverage seeking chiropractor relative to M.D. services (42 to 47 percent versus 6 to 8 percent). Similarly, a smaller proportion of patients with private or Medicaid insurance had coverage for chiropractic relative to M.D. services for back pain. The third study<sup>20</sup> reporting the impact of coverage suggested that up to 42 percent of persons with LBP pay out of pocket for chiropractic services. In contrast, those who seek medical services that include referral to a surgeon or physical therapist pay only 3 percent out-of-pocket; those seeking medical services and who are not referred to either a surgeon or physical therapist have slightly higher (7 percent) out of pocket costs.



**Table 1. Studies listing the use of 4 or greater different CAM therapies specific to back pain**

Study	Type of Back Pain	Subjects with Back Pain/ Total Study n	Total n Seeking Care or Reporting CAM Use	Chiropractic (%)	Manipulation (%)	Massage (%)	Acupuncture (%)	Naturopathy (%)	Homeopathy (%)	Herbals (%) / Food Supplements (%)	Prayer Spirituality (%)	Ultrasonography (%)	Electrotherapy (%)	Yoga (%)	Relaxation Techniques (%)	Other (%)
<b>U.S. Studies</b>																
Bruce <sup>10</sup> ^	CLBP	190/ 296	190	62e			20e			G:45.8				I:29e		M:15
Bruce <sup>10</sup> ^	CLBP	236/ 284	231	C:64e			22e			G:25.5				C:24e		M:18
Carey <sup>9</sup>	CLBP	269/ 4437	186	24.6	22.0	42.0					27.0*	27.0*	18*			
Long <sup>11</sup>	LBP	2374/4 171	2374	46.7	41.3	43.2	9.3 P: 10.2			V:8.2	41.6	41.6	31.8 *		21.5	HC: 67.9
Wolsko <sup>12</sup>	CLBP	644/ 2055	644	19.8 P:18		14.1 P:9	0.9 P:0.9	2.6	P:2.0	V:1.8				1.5 P:0.3	11.7 P:1.7	

^ = data for lifetime prevalence of use of CAM;

\* = provider not specified;

+ = Percent estimates for use of CAM therapy based on frequency for each specific CAM (i.e., sample size varied for each CAM therapy)

Abbreviations: C = Control group; CBN = combined back and neck pain; CLBP = chronic low back pain; e = estimated from bar graph; EH = Energy healing; EL = electrotherapy; G = Glucosamine; HC = hot and cold; I = intervention group; LBP = Low back pain; M = Magnets; P = Provider; R = Reflexology; SG = Support group; UBP = unspecified back pain; V = vitamins

Table 1. Studies listing the use of 4 or greater different CAM therapies specific to back pain (continued)

Study	Type of Back Pain	Subjects With Back Pain/ Total Study n	Total n Seeking Care or Reporting CAM Use	Chiropractic (%)	Manipulation (%)	Massage (%)	Acupuncture (%)	Naturopathy (%)	Homeopathy (%)	Herbals (%) / Food Supplements (%)	Prayer Spirituality(%)	Ultrasonography (%)	Electrotherapy (%)	Yoga (%)	Relaxation Techniques (%)	Other (%)
<b>Non U.S. Studies</b>																
Ramsay <sup>116+</sup>	CBN	667/ 2,000	Varies	75		43	30	16		20	29			19	R:22	EH:11
Esmail <sup>117+</sup>	CBN	667/ 2,000	Varies	61		39	30	10		14	18			14	R:13	EH:20
Foltz <sup>118</sup>	UBP	3259/ 12,946	3259	74.4		55.5	20.6		H:17.8	6.2	0.3				0.6	SG:11.0
Walker <sup>119</sup>	LBP	1,228/ 1,913	547		12.6	17.9	2.2					3.7*	2.5*			

**Table 2. Summary table of studies evaluating trends in utilization of CAM therapies over time for persons with low back pain**

Author Year Country	Sample Size Time-Frame (Years and Dates)	Description of Type of Pain	CAM Therapy	Utilization Over Time	Other Therapy Use
<b>Studies conducted in the United States</b>					
Feuerstein <sup>19</sup> 2004 U.S.	1987 n = 1053 1997 n = 1082	Nonspecific backache: defined using a modified version of algorithm developed by Cherkin et al. <sup>44</sup>	Chiropractic care	Mean # of outpatient visits: 1987 = 9.2 1997 = 7.8 (p = 0.1)  Use of chiropractic care reduced over the decade (40.5% vs. 30.6%; p<0.01)	NA
<b>Non-United States Studies</b>					
Burton <sup>122</sup> 2004 U.K.	n = 151 Respondents at 4 year followup Data collected at an average of 4 years (range 3.5 to 5 years) since presentation	New occurrence of low back (lumbar) trouble unrelated to any serious pathology	Osteopathic manipulative therapy varied number of treatments over periods of time involved passive soft tissue stretching, articulation of lumbar spine, high-velocity thrust techniques	Mean number of sessions = 6.6 (over 1 year) utilization of therapy over the followup period of 1 to 4 years by 50.3% of patients, who sought further care was 17.1% physiotherapy and 56.5% osteopathy	NA
Davies <sup>125</sup> 1996 U.K.	Observation period 1: n = 1,236 Observation period 2: n = 1,791 Observation period 1: July-Dec, 1992 Audit intervention period: May-July, 1993 Observation period 2: Oct 1993-Apr 1994	Lumbar pain Obs 1: 62% LBP 57% nerve-damage pain 18% both Obs 2: 61% LBP 50% nerve-damage pain 11% both	Acupuncture	Baseline: 9.2% of patients from teaching hospitals with LBP used acupuncture 31.9% of patients from district general hospitals used acupuncture no followup on acupuncture utilization	Reported utilization rate changes for anti-depressant drugs, anticonvulsant drugs and TENS

Abbreviations: BP = back pain; LBP = Low back pain; M.D. = Medical Doctor; NA = not applicable; NHS = National Health Service; SCI = spinal cord injury; TENS = Transcutaneous Electrical Nerve Stimulation; TI = Telephone Interview



**Table 2. Summary table of studies evaluating trends in utilization of CAM therapies over time for persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Sample Size Time-Frame (Years and Dates)</b>	<b>Description of Type of Pain</b>	<b>CAM Therapy</b>	<b>Utilization Over Time</b>	<b>Other Therapy Use</b>
Groenendijk <sup>121</sup> 2007 Netherlands	n = 3,148  Study 1 n = 1,948 Study 2 n = 200  Study 1: 1989-1992 Study 2: 2002-2003	LBP without radiation	Physical therapy	100% utilized physical therapy Utilized physical therapy for LBP: Study 1:11.9% Study 2: 15.4%	PT interventions: (% of population in 1989-1992 and 2002-2003 respectively): Massage 55.9%, 38.5%; Physical therapy modalities 45.1%, 11.8%; Exercise therapy 40.9%, 76.3%; Passive mobilization 37.1%, 43.4%; Instruction and advice 22.7%, 29.1%
Hopman <sup>120</sup> 2006 Canada	n = 7,652 Baseline assessments: 1996-1997  5-year followup: 2001-2002	Self-reported back pain; "ever had BP"	Glucosamine	Ever had back pain and used glucosamine Men: 5.1% (95% CI, 4.2- 6.0) Women: 9.5% (95% CI, 8.4-10.7) People who have had back pain are 1.38 (OR; 95% CI: 1.17, 1.64) times more likely to take glucosamine; across all conditions, glucosamine use increased from baseline to 5 year followup Men: 1.2% to 8.5% , Women: 1.8% to 12.8%	NA

**Table 2. Summary table of studies evaluating trends in utilization of CAM therapies over time for persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Sample Size Time-Frame (Years and Dates)</b>	<b>Description of Type of Pain</b>	<b>CAM Therapy</b>	<b>Utilization Over Time</b>	<b>Other Therapy Use</b>
Kilvaer <sup>124</sup> 1997 Norway	n = 1,992 98 out of 140 chiropractors participated, returned 2,401 questionnaires	Back pain (unclear definition)	Chiropractor: Looked at chiropractic as a complementary or alternative intervention Alternative: Non-referred patients who did not consult a medical doctor before commencing chiro treatment Complementary: Referred patients from M.D.s	59.4% of non-referred chiropractic patients had LBP 61.5% of referred patients had LBP Calculated from age and sex-stratified Table 2 (in Kilvaer): 387/653 non-referred women who saw chiropractor had LBP 448/699 non-referred men had LBP 182/317 referred women had LBP 173/268 referred men had LBP	NA
Norrbrink- Budh <sup>112</sup> 2004 Sweden	n = 90 In 1999, 456 patients with SCI (76.5% of the total population of patients with SCI in the Spinalis database at that time) were assessed in a yearly health control	Nocioceptive, neuropathic mixed back pain	TENS acupuncture massage therapy heat/cold mental training physical training	Present and former use: 57 (63.3%) tried 1 or more options	NA

**Table 3. Summary table of studies evaluating trends in utilization of CAM therapies over time for persons with combined neck and back pain**

Author Year Country	Sample Size Time-Frame (Years and Dates)	Description of Type of Pain	CAM Therapy	Utilization Over Time	Other Therapy Use
<b>Studies conducted in the United States</b>					
Eisenberg <sup>5</sup> 1998 U.S.	T1 (1990) n = 1, 539 T2 (1997) n = 2, 055	Back pain (both 1990 and 1997), Neck pain (1997)	Relaxation techniques, herbal medicine, massage therapy, chiropractic care, megavitamins, self-help groups, imagery techniques, commercial diet, folk remedies, lifestyle diet, energy healing, homeopathy, hypnosis, biofeedback, acupuncture, and prayer/spiritual healing	<p>For BACK problems: T1: 19.9% reported back problems 35.9% of those used alternative therapy for back pain (BP), 19.5% saw alternative practitioner</p> <p>COMPLEMENTARY: 36.1% saw M.D. and used alternative therapy for BP, 23% saw M.D. and alternative practitioner for BP</p> <p>T2: 24% reported back problems 47.6% used alternative therapy for back pain, 30.1% saw alternative practitioner</p> <p>COMPLEMENTARY: 58.8% saw M.D. and used alternative therapy for BP, 39.1% saw M.D. and alternative practitioner for BP</p> <p>For NECK problems: T2: 12.1% reported neck problems 57% used alternative therapy for BP, 37.5% saw alternative practitioner for BP, 66.6% saw M.D. and used alternative therapy for BP, 47.5% saw M.D. and alternative practitioner for BP</p> <p>Chiropractic therapy and massage were most commonly used therapies in 1997</p>	NA

Abbreviations: NR = not reported; T1 = Time 1; T2 = Time 2

**Table 3. Summary table of studies evaluating trends in utilization of CAM therapies over time for persons with combined neck and back pain (continued)**

Author Year Country	Sample Size Time-Frame (Years and Dates)	Description of Type of Pain	CAM Therapy	Utilization Over Time	Other Therapy Use
<b>Studies conducted outside the U.S.</b>					
Esmail <sup>117</sup> 2007 Canada	2006 followup of the 1997 study n = 2,000	Self-reported back or neck problems	Chiropractic care, massage, relaxation techniques, prayer/spiritual practice, acupuncture, yoga, herbal therapies, special diet programs, energy healing, naturopathy, homeopathy, folk remedies, self-help group, aromatherapy, imagery techniques, lifestyle diet, spiritual or religious healing by others, hypnosis, osteopathy, high dose/mega vitamins, biofeedback, chelation	Past 12 months back or neck problems treated with the following: chiropractic care 61% massage 39% relaxation techniques 10% prayer/spiritual practice 5% acupuncture 30% yoga 14% energy healing 16%  28% reported having back or neck problems (second most common medical condition reported) 71% used alternative therapy 47% saw CAM provider 3 most commonly therapies: massage therapies, chiropractic care, and prayer	NA
Hartvigsen <sup>123</sup> 2003 Denmark	T1 (1962) n = 1,118 T2 (1999) n = 1,897	Primary complaint LBP LBP and sciatica Neck pain Neck and arm pain	Chiropractor	T1: LBP alone: 33% LBP and sciatica: 17% Neck pain: 6% Neck and arm pain: 6%  T2: LBP alone: 40.7% LBP and sciatica: 8.8% Neck pain: 9.2% Neck and arm pain: 6.2% Thoracic spine: 7.0% Thoracic spine and chest/upper extremity: 2.4%	NA

**Table 4A. Utilization of acupuncture in persons with neck pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Burke <sup>45</sup> 2006 U.S.	CS	FI	“Lifetime” use and use in the past 12 months	30,278	General population	Any condition	Any use of acupuncture	1,266/30,278 (4.1%) reported “lifetime use” of acupuncture 327/30,278 (1.1%) reported use of acupuncture in the “past 12 months” 37/270 (13.6%) used acupuncture for neck pain
Cherkin <sup>44</sup> 2002 U.S.  Companion to Sherman <sup>15</sup> 2006 U.S.	SGPS	SAQ	Visits to practitioner in a 12 month period	133 AT/ 488 eligible practitioners	Practitioners were asked to collect patient information	Any condition	Visit to a licensed acupuncturist	% of neck symptoms being the primary reason for visit by practitioner type and state Reported for Washington only: 92/1,263 (7.3%)

Abbreviations: AT = acupuncture therapist; CS = Cross-sectional; FI = Face to face interview; SAQ = Self-administered questionnaire; SGPS = Single group prospective study

**Table 4B. Utilization of acupuncture in persons with neck pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Burke45 2006 U.S.	Not reported	Not reported
Cherkin44 2002 U.S.  Companion to Sherman15 2006 U.S.	NSBP Acupuncture patients receiving care from M.D. or OD Massachusetts: 49.7% Washington: 56.2%	Not reported

Abbreviations: CAM = Complementary and Alternative Therapy; M.D. = Medical Doctor; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; OD = Osteopathic Doctor

**Table 5A. Utilization of acupuncture in persons with unspecified back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Bruce <sup>10</sup> 2004 U.S.	RCT	SAQ	Past 12 months	Intervention: 190/296 (64.1%) Control: 231/284 (81.3%)	Participants with recurrent back pain but not receiving any disability insurance	CBP Mean duration back pain: 13.4 yrs (SD=10)	Baseline: “Ever tried CAM”. Could include ≥1 CAM therapy 1 year: “CAM in past 6 months”	Baseline: Intervention: 38/190 (20%) Control: 53/231 (23%)  Outcomes: Intervention: 5/190 (2.6%) Control: 5/231 (2.2%)
Burke <sup>45</sup> 2006 U.S.	CS	FI	“Lifetime” use and use within the past 12 months	30,278	General population	Any condition	Ever used or recent use of acupuncture	1,266/30,278 (4.1%) reported “lifetime use” of acupuncture  327/30,278 (1.1%) reported use of acupuncture in the “past 12 months”  92/270 (34.0%) used acupuncture for back pain
Cherkin <sup>44</sup> 2002 U.S.	SGPS	SAQ	Visits to practitioner in a 12-month period	133 AT, 488 eligible practitioners	Practitioners were asked to collect patient information	Any condition	Visit to a practitioner	Back ‘symptoms’ Massachusetts: 147/1,298 (11.3%) Washington: 215/1,263 (17.0%)

Abbreviations: AT = acupuncture therapist; CAM = Complementary and Alternative Medicine; CBP = chronic back pain; CLBP = Chronic low back pain; CS = Cross-sectional; D.C. = Doctor of Chiropractic; FI = Face to face interview; HRR = Health record review; LBP = Low back pain; M.D. = Medical Doctor; MT = massage therapist; NP = Naturopathic Physician; SAQ = Self-administered questionnaire; SD = Standard Deviation; SGPS = Single group prospective study; TI = Telephone interview; yrs = years

**Table 5A. Utilization of acupuncture in persons with unspecified back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Sherman <sup>15</sup> 2006 U.S. Companion to Cherkin <sup>44</sup> 2002 U.S.	SGPS	SAQ	Visits to practitioner in a 12-month period	219 visits to licensed AT	Patients with CBP	Any condition	Visit to AT	10% of visits to the AT were for any back pain  2/3 of visits were for CBP  1/3 of visits were for acute back pain  Visit duration: Median 60 minutes
<b>Studies from outside the United States</b>								
Foltz <sup>118</sup> 2005 Canada	CS	TI	Past 12 months	Complete sample 66,253  Non-specific CBP 11,736 (17.7%)  CAM users 3,259 (39%)	Subset from a large national general sample collected from 1996 to 1998 1 of 4 groups identified was "CBP or musculo- skeletal disease"	CBP was diagnosed by a health professional	'CAM users' if: 1) received or discussed CAM with a non- mainstream practitioner 2) used a support group for health problem 3) received care from D.C.	CBP respondents, 39% (95% CI: 38.1- 39.9) had used CAM during the past 12 months 20.6% (95% CI: 19.4 to 22.8) of this sample used acupuncture



**Table 5A. Utilization of acupuncture in persons with unspecified back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
Giles <sup>126</sup> 2003 Australia	SGPS	HRR SAQ	New cases followed for 12 months	861/1,775 (48.5%) patients referred to spine pain clinic received treatment with CAM	Sample from a specialized clinic (multi- disciplinary spinal pain unit)  Majority chronic pain (92.7%)	100% with spinal pain; of the 941 patients who could recall when their symptom began 92.7% reported chronic pain (>3 months duration)	Treatment with acupuncture	507/1,775 (28.6%) treated with needle acupuncture.  Of those receiving treatment (507/861), 58.9% received needle acupuncture  7,831 visits patients receiving acupuncture
Sibbritt <sup>127</sup> 2007 Australia	CS	SAQ	Past 12 months	11,143/11,202 responded to question about acupuncture use. 466/11,143 (4.2%) women reported use of acupuncture	Middle-aged Australian women, aged 50 to 55	Variety of conditions	Consultation with an AT	284/466 (61%) consulted an AT for back pain

**Table 5B. Utilization of acupuncture in persons with unspecified back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Bruce <sup>10</sup> 2004 U.S.	Not collected	Not reported but data presented indicated respondents had used 1 or more CAM therapy
Burke <sup>45</sup> 2006 U.S.	Not reported	Not reported
Cherkin <sup>44</sup> 2002 U.S.	NSBP	NSCAM
Sherman <sup>15</sup> 2006 U.S.  Companion to Cherkin <sup>44</sup> 2002 U.S.	Not reported	Heat: 61 to 72% East Asian massage: 24 to 42% Herbs: 27to 29% Cupping: 14 to 26%

Abbreviations: CAM = Complementary and Alternative Therapy; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; PT = Physical Therapist

**Table 5B. Utilization of acupuncture in persons with unspecified back pain (continued)**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies conducted outside the United States</b>		
Foltz <sup>118</sup> 2005 Canada	For CAM users: Percent reporting visit: To any physician: 6.2% (95% CI 6.0-6.4) To GP: 5.1% (95% CI 5.0-5.3) To specialists: 1.1% (95% CI 1.0-1.2) To PT: 2.4% (95% CI 2.2-2.4) To psychologists: 0.3% (95% CI 0.3-0.3)	Concurrent use evident but data not stratified by type of CAM therapy
Giles <sup>126</sup> 2003 Australia	Not reported	Not specified
Sibbritt <sup>127</sup> 2007 Australia	Not collected	Not collected

**Table 6A. Utilization of acupuncture in persons with low back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Lind <sup>16</sup> 2005 U.S.	Retro Rev	AD	Outpatient visits over course of 1 year	109,080/ 601,044 enrollees had back pain; 104,358 (96%) were eligible for review	Enrollees (ages 18-64) in large health insurance plans; enrollees had NOT been hospitalized or undergone surgery for back pain	Back pain	At least one visit for back pain to a CAM provider	Acupuncture - used by 2,701 persons (2.6% of back pain population) - had 15,500 visits (2.4% of total visits) - median number of visits was 4 - 962/104,358 (0.9%) LBP sought acupuncture only
Long <sup>11</sup> 1996 U.S.	SGPS	SAQ	Past 12 months	2,374/4,171 subjects had complete data and followup	Adult patients presenting to centers for orthopedic surgery or neurosurgery consultation	100% of patients presented with persistent LBP (mean duration of current episode 2.52 years)	Treatments or visits to CAM practitioners	Acupuncture was previously used by 9.3% Specialists consulted for back pain before enrollment in the study: AT – 10.2%

Abbreviations: AD = administrative database; AT = Acupuncture Therapist; BA = before after; CAM = Complementary and Alternative Medicine; CI = Confidence interval; CBP = Chronic back pain; CS = Cross-sectional; D.C. = Doctor of Chiropractic; FI = Face to face interview; GP = general practitioner; HRR = Health record review; LBP = Low back pain; M.D. = Medical Doctor; MT = massage therapist; NHS = National Health Service; NP = Naturopathic Physician; Retro Rev = Retrospective Review; SAQ = Self-administered questionnaire; SD = standard deviation; SGPS = Single group prospective study; TI = Telephone interview

**Table 6A. Utilization of acupuncture in persons with low back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Sherman <sup>18</sup> 2004 U.S.	CS	TI	Lifetime use	Pilot sample obtained from health claims database; 249/787 patients responded to interview	Members of a non-profit managed health care system and a large multi- specialty group practice	100% persistent non-specific LBP >3 months	Reported "Ever tried"	Acupuncture had been "ever tried" by 11% of back pain patients
<b>Studies from outside the United States</b>								
Caswell <sup>128</sup> 2002 U.K.	CS	SAQ	Lifetime use	150 subjects had back pain divided into three groups: 1) CBP using CAM 2) CBP not using CAM 3) no back pain	Subjects attending private physiotherapy or NHS pain clinics	CLBP	Visit to CAM practitioner	10/50(20%) used acupuncture to treat back pain  36% conventional patients had used at least 1 CAM therapy in the management of their back pain (use with acupuncture not specified)
Chenot <sup>51</sup> 2006 Germany	SGPS	FI	Past 12 months	1,345/ 1,588 (84.6%) back pain patients  1,218/1,345 (90.6%) completed 12 month followup	Sample recruited within practices of general practitioners	Consecutive patients with LBP	Use of CAM therapy	179/1,218 (13%) received acupuncture during 12 month followup  Acupuncture sessions  Range = 1 to 47 mean 12 (SD ± 8.8)

**Table 6A. Utilization of acupuncture in persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Study Design</b>	<b>Reporting Mode</b>	<b>Timing of CAM Visit</b>	<b>Sample Size</b>	<b>Population</b>	<b>Clinical Presentation</b>	<b>Episode of Care</b>	<b>Outcomes</b>
Davies <sup>125</sup> 1996 U.K.	BA	HRR	Within 6 months, then following 7 months	Observation period 1: 761/ 1,236 (62%) LBP  Observation period 2: 1,096/1,791 (61%) LBP	Patients from 10 specialized outpatient pain clinics Patients with either nerve damage or LBP were selected	Nerve damage, LBP	Receiving acupuncture	Observation period 1: 142/ 761 (18.7%) acupuncture treatment  Observation period 2: Not specified
Scheurmier <sup>129</sup> 1998 U.K.	SGPS Retro Rev	HRR	Past 4 months	484/592 (84%)	Patients from GP practices in the U.K.	100% with acute LBP (duration <6 weeks)	Visit to CAM provider	49/259 (19%) received acupuncture referral
Walker <sup>119</sup> 2004 Australia	CS	SAQ	Past 6 months	1,913/2,748 (69.6%) responded; 1,228/1,913 (64.1%) indicated at least 1 episode of back pain	Individuals from the electoral roll in Australia	100% reported LBP in the last 6 months	Visit to CAM practitioner	Acupuncture was sought by 35 patients (2.2%) with back pain and seeking care

**Table 6B. Utilization of acupuncture in persons with low back pain**

<b>Author Year Country</b>	<b>Use with Conventional Care</b>	<b>Concurrent use with Other CAM</b>
<b>Studies from the United States</b>		
Lind <sup>16</sup> 2005 U.S.	Concurrent use possible, but not specified	Concurrent use evident but data not stratified by type of CAM therapy. However, 89% of CAM users saw one type of CAM provider (but not stratified by therapy type)
Long <sup>11</sup> 1996 U.S.	NSBP: Not reported for period prior to enrollment	NSCAM: Concurrent use evident but data not stratified by type of CAM therapy
Sherman <sup>18</sup> 2004 U.S.	Not specified for acupuncture	Not collected
<b>Studies conducted outside the United States</b>		
Caswell <sup>128</sup> 2002 U.K.	90% (9/10) acupuncture patients used at least 1 conventional therapy as a CLBP management method 62% CAM users sought conventional care	Not collected
Chenot <sup>51</sup> 2006 Germany	Patients using acupuncture saw specialists (84%), physiotherapy (63%), took medications (16% to 75%), and injection therapy (75%)	Also received chiropractic (46%), and massage (37%) Electrotherapy and TENS also received but provider type not specified
Davies <sup>125</sup> 1996 U.K.	Use of medications, TENS, and nerve blocks were frequently used but proportion overlap with acupuncture not specified	Not collected
Scheurmier <sup>129</sup> 1998 U.K.	Not specified for acupuncture	Not specified for acupuncture
Walker <sup>119</sup> 2004 Australia	Not stratified by therapy	NSCAM

Abbreviations: CLBP = Chronic low back pain; LBP = Low back pain; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; TENS = Transcutaneous Electrical Nerve Stimulation

**Table 7A. Utilization of acupuncture in persons with combined neck and back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Wolsko <sup>12</sup> 2003 U.S.	CS	TI	Past 12 months	644/2,055 respondents reported back pain (60% response rate)	Individuals who have had neck or back pain in the past 12 months	46% had pain in more than 1 location 38% had LBP only 16% had neck or upper back pain only	Use of a CAM therapy or visit with CAM practitioner	Acupuncture: 0.9% Mean number of visits: 2.6 Estimated total visits: 1.6 million Relative frequency for CAM use did not differ by the location of the back pain
<b>Studies outside the United States</b>								
Esmail <sup>117</sup> 2007 Canada  Companion to Ramsay <sup>116</sup> 1999 Canada	CS	TI	Past 12 months	Second wave: 376/2,000 (18.8%) respondents First wave: 386/1,500 (25.7%)	General adult population	NSBP back or neck problems in the past 12 months	Use of a CAM therapy or visit with a practitioner who is not a medical doctor	Acupuncture use in persons with back pain 30% (1997) 30% (2006)

Abbreviations: AT = Acupuncture Therapist; CAM = Complementary and Alternative Medicine; CS = Cross-sectional; LBP = Low back pain; NSBP = Data not stratified by back pain; TI = Telephone interview



**Table 7B. Utilization of acupuncture in persons with combined neck and back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Wolsko <sup>12</sup> 2003 U.S.	NSCAM 25% had used both complementary medicine and a conventional provider	Used any CAM: from those with back and neck pain, 29% had used CAM alone Concurrent use not specified
<b>Studies conducted outside the United States</b>		
Esmail <sup>117</sup> 2007 Canada  Companion to Ramsay <sup>116</sup> 1999 Canada	NSBP 2006: 30% saw a medical doctor in the 12 months 1997: 14% utilized both a medical doctor and alternative provider within the past 12 months.	Not specified for acupuncture

Abbreviations: CAM = Complementary and Alternative Therapy; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy

**Table 8A. Utilization of massage in persons with neck pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Cherkin <sup>44</sup> 2002 U.S.	SGPS	SAQ	Past 12 months	MT: 126/488 (25.8%) eligible practitioners	Practitioners from several professions asked to collect patient information	Any condition	Visit to a licensed MT	% of neck symptoms being the primary reason for visit by practitioner type and state Connecticut: 125/965 (13.0%) Washington: 208/1,040 (20.0%)
Companion to Sherman <sup>15</sup> 2006 U.S.								
<b>Studies from outside the United States</b>								
Vos <sup>130</sup> 2007 Netherlands	SGPS	SAQ	Utilization reported prior to entry into the study	187/259 (72%) patients enrolled in the study	Patients recruited from general practice setting - all persons had neck pain	Acute neck pain	Visit to CAM practitioner at baseline	Patients at baseline use: 13/187 (7%)

Abbreviations: CAM = Complementary and Alternative Medicine; MT = massage therapist; SAQ = Self-administered questionnaire; SGPS = Single group prospective study

**Table 8B. Utilization of massage in persons with neck pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Cherkin <sup>44</sup> 2002 U.S.	NSBP	NSCAM
Companion to Sherman <sup>15</sup> 2006 U.S.		
<b>Studies conducted outside the United States</b>		
Vos <sup>130</sup> 2007 Netherlands	Not applicable as all enrolled patients saw conventional practitioner	Concurrent use at baseline apparent but overlap not specified. During followup 12% (23 patients) used CAM; most often this was Reiki/energy, healing therapy and acupuncture

Abbreviations: CAM = Complementary and Alternative Medicine; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy

**Table 9A. Utilization of massage in persons with unspecified back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Cherkin <sup>44</sup> 2002 U.S.  Companion to Sherman <sup>15</sup> 2006 U.S.	SGPS	SAQ	Past 12 months	MT: 126/488 (25.8%) eligible practitioners	Practitioners from several professions, were asked to collect patient information	Any condition	Visit to a licensed MT	% of back symptoms being the primary reason for visit by practitioner type and state: Connecticut: 197/965 (20.4%) Washington: 210/1,040 (20.2%)
Sherman <sup>15</sup> 2006 U.S.  *Companion to Cherkin <sup>44</sup> 2002 U.S.	SGPS	SAQ	Past 12 months	236 visits to licensed MT	Patients with CBP	100% had CBP	Visit to provider	# visits for CBP: Connecticut: 121 Washington: 115  Deep tissue 82(4%), 84(2%) Swedish 85(5%), 76(5%) Trigger point 57(6%), 62(5%)  1/3 ABP and 2/3 for chronic pain CBP

Abbreviations: CAM = Complementary and Alternative Medicine; CI = Confidence interval; CBP = Chronic back pain; CS = Cross-sectional; D.C. = Doctor of Chiropractic; MT = massage therapist; SAQ = Self-administered questionnaire; SGPS = Single group prospective study; TI = Telephone interview

**Table 9A. Utilization of massage in persons with unspecified back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from outside the United States</b>								
Foltz <sup>118</sup> 2005 Canada	CS	TI	Past 12 months	Complete sample 66,253 Non-specific CBP 11,736 (17.7%) CAM users 3,259 (39%)	Subset from a large national general sample collected from 1996 to 1998 Four groups were identified and one group was "CBP or musculoskeletal disease"	CBP was diagnosed by a health professional	'CAM users' if: 1) received or discussed CAM with a non- mainstream practitioner 2) used a support group for health problem 3) received care from D.C.	Chronic back pain respondents, 39% (95% CI 38.1-39.9) had used CAM during the past 12 months 55.5 % (95% CI 54.1- 57.0) used massage 21% (2,425) had attended a D.C. in the past 12 months

**Table 9B. Utilization of massage in persons with unspecified back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Cherkin <sup>44</sup> 2002 U.S.  *Companion to Sherman <sup>15</sup> 2006 U.S.	NSBP	NSCAM
Sherman <sup>15</sup> 2006 U.S.  Companion to Cherkin <sup>44</sup> 2002 U.S.	Not specified for massage	Movement re-education 23%/30% Energetic work 5%/4% Neuromuscular 3%/6% Reflexology 3%/4% Breathwork 4%/4%
<b>Studies conducted outside the United States</b>		
Foltz <sup>118</sup> 2005 Canada	CAM users reporting visit to: Physician: 6.2% (95% CI 6.0-6.4) GP: 5.1% (95% CI 5.0-5.3) Specialists: 1.1% (95% CI 1.0-1.2) PT: 2.4% (95% CI 2.2-2.4) Psychologists: 0.3% (95% CI 0.3-0.3)	Concurrent use evident but data not stratified by type of CAM therapy

Abbreviations: CAM = Complementary and Alternative Medicine; CI = Confidence interval; GP = General Practitioner; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; PT = Physical Therapist

**Table 10A. Utilization of massage in persons with low back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Carey <sup>9</sup> 1995 U.S.	CS	TI	Past 12 months	269/4,437 (3.9%) interviewed had CLBP	North Carolina residents	100% with CLBP (functionally limited for >3 months or >25 episodes of LBP in past 12 months)	Visit with a health provider; lifetime prevalence	For those seeking care for LBP massage: 78/187 (42%)
Lind <sup>16</sup> 2005 U.S.	Retro Rev	AD	Outpatient visits over 1 year	Back pain: 109,080/ 601,044 (18.1%) Reviewed: 104,358 (17.4%) Use massage; 11,694 (11.2%)	Enrollees in health insurance plans that had NOT been hospitalized or had surgery for back pain	Back pain	Visit for back pain to a CAM provider	Massage: 4,317/104,358 (4.1%) LBP patients sought massage only
Long <sup>11</sup> 1996 U.S.	SGPS	SAQ	Past 12 months	2,374/4,171 (56.9%) subjects had complete data and followup	Adult patients presenting for orthopedic surgery on neurosurgery consultation	100% of patients with persistent LBP Mean duration LBP: 2.52 years	Treatments for back pain prior to enrollment into the study	Massage previously used by 43.2%

Abbreviations: AD = administrative database; ALBP = acute low back pain; CAM = Complementary and Alternative Medicine; CBP = Chronic back pain; CLBP = Chronic low back pain; CS = Cross-sectional; D.C. = Doctor of Chiropractic; FI = Face to face interview; HRR = health record review; LBP = Low back pain; M.D. = Medical Doctor; MT = massage therapist; ND = Naturopathic Doctor; O.D. = Osteopathic Doctor; PT = Physical Therapist; Retro Rev = Retrospective Review; Q = Self-administered questionnaire; SAQ = self-administered questionnaire; SGPS = Single group prospective study; TI = Telephone interview

**Table 10A. Utilization of massage in persons with low back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Mielenz <sup>30</sup> 1997 U.S.	SGPS	TI	Past 12 months	1,540 ALBP 199/1540 (12.9%) seeking treatment from PT	Patients recruited from healthcare providers	100% with acute LBP (<10 week duration)	Visit with a health provider; lifetime prevalence	Sought physical therapy: 49% received massage
Nyiendo <sup>22</sup> 2001 U.S.	SGPS	SAQ HRR	Past 12 months	121/2,945 (4.1%) from medical practices 147/2,945 (4.9%) chiropractor practices	Persons with CLBP with sciatica	100% with CLBP and sciatica (>6 weeks duration)	Visit to practitioner	Chiropractic patients: 52.4% received massage
Nyiendo <sup>23</sup> 2001 U.S.  Companion to Nyiendo <sup>22</sup> 2001 U.S.	SGPS	SAQ HRR	Past 12 months	2,945 patients enrolled; 309 from medical practices 526 from chiropractic practices	Persons with CBP with sciatica	100% with chronic LBP and sciatica (>6 weeks duration)	Visit to practitioner	D.C. use of massage was similar to that reported for electrotherapy (42.7%) received electrotherapy at least 1 visit >5 treatments (10%)
Stano <sup>20</sup> 2002 U.S. Companion to Nyiendo <sup>22,23</sup> 2001 U.S.	SGPS	SAQ HRR	Past 12 months	2,872 total 922 medical patients 1,950 chiropractic patients	Patients with ALBP and CLBP	Acute and chronic ambulatory LBP of mechanical origin	Frequency of therapy procedure codes used	Out of 28,061 visits: 1,449 (5.2%) received massage



**Table 10A. Utilization of massage in persons with low back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
Shekelle <sup>33</sup> 1995 U.S.	Retro Rev	HRR	Past 12 months	80 patient records were selected (10 from each of 8 chiropractic practices)	Patient record from random sample of chiropractic practices	100% with LBP (56%<3 weeks duration; 25% >13 weeks duration)	First visit between specified interval	Massage 25%
Sherman <sup>18</sup> 2004 U.S.	SGPS	SAQ HRR	Lifetime use	Health claims database; Participants: 249/787 (31.6%) 24/249 (9.6%) tried massage for back pain	Members of a non-profit managed health care system and a large multi- specialty group practice	Non-specific LBP that had persisted for more than 3 months	Any visit to MT	Massage had been “ever tried” by 24% of back pain patients
<b>Studies from outside the United States</b>								
Chenot <sup>51</sup> 2006 Germany	SGPS	FI	Past 12 months	1,345/ 1,588 recruited back pain patients. 1,218 completed 12 month followup; from these 179 used acupuncture	Sample recruited within practices of general practitioners	Consecutive patients with LBP	Use of CAM therapy	67/175 (37%) received massage in addition to acupuncture 350/1,145 (30%) received massage only
Groenendijk <sup>1</sup> 21 2007 Netherlands	Retro Rev	AD	Study 1: 1989 to 1992 Study 2: 2002 to 2003	Study 1: LBP: 1,948/16,000 (11.9%) Study 2: LBP: 1,200/7,561 (15.4%)	Sample from AD of patients treated by PT for back pain	LBP without radiation, greater than 18 years of age	Visits to physical therapist	Study 1: 55.9% massage (most frequently used modality) Study 2: 38.5% massage (third most frequently used modality)

**Table 10A. Utilization of massage in persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Study Design</b>	<b>Reporting Mode</b>	<b>Timing of CAM Visit</b>	<b>Sample Size</b>	<b>Population</b>	<b>Clinical Presentation</b>	<b>Episode of Care</b>	<b>Outcomes</b>
Walker <sup>19</sup> 2004 Australia	CS	SAQ	Past 6 months	Responders: 1,913/2,748 (69.6%) At least 1 episode of back pain: 1,228/1,913 (64.1%)	Individuals from the electoral roll in Australia	100% reported LBP in the last 6 months	Visit to CAM practitioner	Massage: 286/1,595 (17.9%) of those with back pain seeking care MT use: 161/1,076 (15.0%)

**Table 10B. Utilization of massage in persons with low back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Carey <sup>9</sup> 1995 U.S.	Concurrent use evident but not stratified by therapy	Concurrent use evident but not stratified by therapy
Lind <sup>16</sup> 2005 U.S.	Concurrent use possible, but not specified	Concurrent use evident but data not stratified by type of CAM therapy 89% of CAM users saw one type of CAM provider not stratified by therapy type
Long <sup>11</sup> 1996 U.S.	Not reported for period prior to enrollment	Concurrent use evident but data not stratified by type of CAM therapy
Mielenz <sup>30</sup> 1997 U.S.	Concurrent use evident but not stratified by therapy	Massage may have been used with spinal manipulation; other modalities are not considered CAM if administered by a physical therapist
Nyiendo <sup>22</sup> 2001 U.S.	Not applicable	Concurrent use evident but not stratified by therapy; likely received spinal manipulation.
Nyiendo <sup>23</sup> 2001 U.S.  *Companion to Nyiendo <sup>22</sup> 2001 U.S.	Not applicable	Concurrent use evident but not stratified by therapy; likely received spinal manipulation
Stano <sup>20</sup> 2002 U.S.  *Companion to Nyiendo <sup>22,23</sup> 2001 U.S.	Not applicable	Physical therapy modalities were frequently used, with massage and trigger-point therapy used most often

Abbreviations: CAM = Complementary and Alternative Medicine; D.C. = Doctor of Chiropractic; GP = general practitioner; MT = Massage therapist; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy

**Table 10B. Utilization of massage in persons with low back pain (continued)**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Shekelle <sup>33</sup> 1995 U.S.	Not applicable	Not specified for massage but likely received chiropractic manipulation
Sherman <sup>18</sup> 2004 U.S.	Not specified	Not collected
<b>Studies conducted outside the United States</b>		
Chenot <sup>51</sup> 2006 Germany	Not specified for massage	Not specified for massage
Groenendijk <sup>121</sup> 2007 Netherlands	Not applicable	Not specified, but likely used passive mobilizations
Walker <sup>119</sup> 2004 Australia	59% attended multiple providers 3.3% from a GP and D.C. 1.5% from a GP, D.C., and MT	NSCAM

**Table 11A. Utilization of massage in persons with combined neck and back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Wolsko <sup>12</sup> 2003 U.S.	CS	TI	Past 12 months	644/ 2,055 (60%) reported back pain	Individuals who have had neck or back pain in the past 12 months	46% had pain in more than 1 location 38% had LBP only 16% had neck or upper back pain only	Use of a CAM therapy or visit with CAM practitioner	Massage used 14.1% (95% CI; 10.8-17.4) LBP (38%) Neck pain only (16%) Pain in more than 1 location (46%) Mean number of visits: 5.4 Estimated total visits: 32.8 million
<b>Studies from outside the United States</b>								
Cote <sup>131</sup> 2001 Canada	CS	SAQ	Past 4 weeks	1,131/2,184 (55%) participated 907/1,131 (80%) had back or neck pain	Saskatchewan Health Insurance and Registration File	100% had back and/or neck pain in the past 6 months	Visit to health care provider	215 who saw a provider for neck or LBP within the last 4 weeks 7% consult massage therapist
Esmail <sup>117</sup> 2007 Canada  Companion to Ramsay <sup>116</sup> 1999 Canada	CS	TI	Past 12 months	First wave: n = 1,500 28% reported back or neck problems Second wave: n = 2,000 30% reported back or neck problems	General adult population in Canada	30% reported back or neck problems in the past 12 months	Use of a CAM therapy or visit with a practitioner who is not a medical doctor	Massage use in persons with back pain 39% (2006) 42% (1997)

Abbreviations: CAM = Complementary and Alternative Medicine; SAQ = Self-administered questionnaire; SGPS = Single group prospective study; TI = Telephone interview

**Table 11B. Utilization of massage in persons with combined neck and back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Wolsko <sup>12</sup> 2003 U.S.	25% had used both complementary medicine and a conventional provider	Used any CAM: back and neck pain, 29% had used CAM alone. However, concurrent use not specified. Relative frequency for CAM use did not differ by the location of the back pain.
<b>Studies conducted outside the United States</b>		
Cote <sup>131</sup> 2001 Canada	M.D. & MT: 3.7% M.D., D.C., PT, MT : 2.8%	D.C. & MT: 5.1 % Care seeking did not differ between neck and back pain patients
Esmail <sup>117</sup> 2007 Canada  *companion to Ramsay <sup>116</sup> 1999 Canada	25% had used both complementary medicine and a conventional provider	Not specified for massage

Abbreviations: CAM = Complementary and Alternative Medicine; D.C. = Doctor of Chiropractic; M.D. = Medical Doctor; MT = Massage therapist; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; PT = Physical Therapist

**Table 12A. Utilization of chiropractic/manipulation in persons with neck pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Cherkin <sup>44</sup> 2002 U.S.  Companion to Sherman <sup>15</sup> 2006 U.S.	SGPS	SAQ	Visits to practitioner in a 12-month period	130 chiropractors/ 488 eligible practitioners	Practitioners from several professions	Any condition	Visit to practitioner	Massachusetts: 304/1,349 (22.5%) Arizona: 294/1,201 (24.5%)
Hawk <sup>25</sup> 2000 U.S.	SGPS	SAQ	17 week followup period	8,312 patients all ages ≥55: 805 (9.7%)	Undergoing chiropractic care	Acute, subacute, and chronic	Visit to a D.C.	All patients Neck Pain: 1,388/8,312 (16.7%) ≥55: 68/805 (8.5%)
Metz <sup>40</sup> 2004 U.S.	Retro Rev	AD	claims data from 1997 to 2001	patients with coverage 81,833 without coverage 121,049	Members of a health plan for regional managed care network	With and without coverage for chiropractic Neck pain with discopathy or radiculopathy	All services using ICD-9 codes with a maximum gap of 45 days between claims were called 1 episode of care	Rates of episodes of care (per 1,000 member years) Neck pain: with coverage 44.8% without coverage 30.7%
<b>Studies from outside the United States</b>								
Cote <sup>135</sup> Canada 2005	Retro Rev	AD SAQ	Claims data and practitioner use 1995	2,486	Patients claiming for disability benefits following an MVA	100% acute whiplash (<30 days since accident)	Visit to D.C.	227/2,486 (9.1%) D.C. care alone; 4.6% attended for 1-6 visits 4.5% attended for >6 visits

Abbreviations: AD = administrative database; CAM = Complementary and Alternative Medicine; D.C. = Doctor of Chiropractic; ICD = International Classification of Diseases; LBP = Low back pain; M.D. = Medical Doctor; MT = massage therapist; MVA = Motor Vehicle Accident; SAQ = Self-administered questionnaire; SGPS=Single group prospective study

**Table 12A. Utilization of chiropractic/manipulation in persons with neck pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from outside the United States</b>								
Hartvigsen <sup>134</sup> 2002 Denmark	CS	SAQ	Ever have treatment	176 Chiropractic clinics 1,897 patients within these practices	Chiropractic clinics	Neck or LBP	Any visit to a D.C.	Percent of patients seeing D.C. Neck: 9.2% Thorax: 7:0 % Low back: 40.7%
Hawk <sup>25</sup> 2000 Canada	SGPS	SAQ	17 week followup period	8,312 patients all ages  ≥55: 805 (9.7%)	Undergoing chiropractic care	Any condition	Visit to a D.C.	All patients: 1,388/8,312 (16.7%)  ≥55: 68/805 (8.5%)
Kilaver <sup>124</sup> 1997 Norway	CS	SAQ	Any visit to a D.C.	Patients within D.C. practices: 2,154 Patients 631 (29.3%) referred by M.D. 1,523 (70.7%) non-referred	Adult chiropractic patients	Various conditions	Ever seen a D.C.	Based on D.C. diagnosis cervicalgia and cervicobrachialgia 111/1,523 (7.3%)  Non-referred patients 52/631 (8.3%) referred patients



**Table 12B. Utilization of chiropractic/manipulation in persons with neck pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Cherkin <sup>44</sup> 2002 U.S.  Companion to Sherman <sup>15</sup> 2006 U.S.	NSBP	NSCAM
Hawk <sup>25</sup> 2000 U.S.	NSBP	NSCAM
Metz <sup>40</sup> 2004 U.S.	NSBP	NSCAM
<b>Studies conducted outside the United States</b>		
Cote <sup>135</sup> 2005 Canada	11.8% pursued D.C. and GP care concurrently	NSCAM
Hartvigsen <sup>134</sup> 2002 Denmark	NSBP	NSCAM
Kilaver <sup>124</sup> 1997 Norway	Not applicable	NSCAM

Abbreviations: CAM = Complementary and Alternative Therapy; D.C. = Doctor of Chiropractic; GP = General Practitioner; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy

**Table 13A. Utilization of chiropractic/manipulation in persons with unspecified back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Bruce <sup>10</sup> 2005 U.S.	RCT	SAQ	Past 12 months	Intervention: 190/296 (64.1%)  Control: 231/ 284 (81.3%)	Recurrent back pain, not receiving any disability insurance	Recurrent back pain  Mean duration of back pain 13.4 yrs (SD=10)	Baseline: “Ever tried D.C.” Could include ≥1 CAM therapy 1 year: “D.C. in past 6 months”	Baseline Intervention: 120/190 (63%) Control: 150/231 (65%)  Outcomes Intervention: 8/190 (3.8%) Control: 10/231 (4.2%)
Cherkin <sup>44</sup> 2002 U.S.	SGPS	SAQ	Visits to practitioner in a 12 month period	130 chiropractors 488 eligible practitioners	Practitioners from several professions, were asked to collect patient information	Any condition	Visit to practitioner	% primary reason of chiropractic visit Massachusetts: 596/1,349 (44.2%) Arizona: 492/1,201 (41.0%)

Abbreviations: AD = administrative database; BP = back pain; CAM = complementary and alternative medicine; CLBP = Chronic low back pain; CS = Cross-sectional; D.C. = Doctor of Chiropractic; FI = Face to face interview; HRR = Health record review; LBP = Low back pain; M.D. = Medical Doctor; MT = massage therapist; NP = Naturopathic Physician; RCT = randomized controlled trial; SD = standard deviation; SAQ = Self-administered questionnaire; SGPS = Single group prospective study; TI = Telephone interview

**Table 13A. Utilization of chiropractic/manipulation in persons with unspecified back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Hawk <sup>25</sup> 2000 U.S.	SGPS	SAQ	17 week followup period	8,312 patients all ages 805 aged 55+	Undergoing chiropractic care	Any condition	Visit to a D.C.	All patients Back Pain: 3,142/8,312 (37.8%): ≥55: 265/805 (32.9%)
Hurwitz <sup>29</sup> 1997 U.S.	CS	TI	Past 12 months	4,790	Survey data from randomly sampled adults with reported back pain	Majority of conditions were chronic traumatic (36.5%) or non-traumatic (27.5%)	Visit to practitioner	3.5% (168) attended a D.C. during the 2-week reference period 43.6% of these had more than 1 visit
Shekelle <sup>34</sup> 1995 U.S.  Shekelle <sup>43</sup> 1995 U.S.	SGPS	AD	Tracked use over a 3 to 5 year period	Data on 1,020 episodes of back pain care made by 686 different persons	From the RAND Health Insurance Experiment	100% had back pain, defined as “pain, swelling, injury of back region”	“A visit or series of visits that belong together”	D.C.s were primary providers for 40% of all episodes of back pain D.C.s were the first provider for 38% of all episodes of back pain D.C.s provided a mean number of 10.4 visits per episode D.C.’s had a retention rate of 92% for 2 <sup>nd</sup> visits

**Table 13A. Utilization of chiropractic/manipulation in persons with unspecified back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
Shekelle <sup>38</sup> U.S. 1991	SGPS	AD	Tracked use over a 3 to 5 year period	5,279	Enrolled in Health Insurance Experiment; from these 395 (7.5 %) made at least one visit to a D.C.	Pain, swelling, injury for the back region	Visit to practitioner	Per 100 person-years from 19,021 person years: 17.4 (42.1%) specified that problems with the back region was the main reason for the D.C. visit  Back problems plus adjustment accounted for 50% of visits overall (varying from 41 to 69% depending on the site)
Sherman <sup>15</sup> U.S. 2006	SGPS	SAQ	Visits to practitioner in a 12-month period	130 randomly selected D.C.s provided data on 523 consecutive patient visits	Patients with chronic BP in two states	100% had chronic BP	visit to D.C.	Per 100 person-years from 19,021 person years: 17.4 (42.1%) specified that problems with the back region was the main reason for the D.C. visit  Back problems plus adjustment accounted for 50% of visits overall (varying from 41 to 69 % depending on the site)

**Table 13A. Utilization of chiropractic/manipulation in persons with unspecified back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from outside the United States</b>								
Foltz <sup>118</sup> 2005 Canada	CS	TI	Past 12 months	Complete sample 66,253 Non-specific chronic BP 11,736 (17.7%) CAM users 3,259 (39%)	Subset from a large national general sample collected from 1996 to 1998 groups identified as "chronic BP or musculo- skeletal disease"	Chronic BP was diagnosed by a health professional	'CAM users': 1) received or discussed CAM with a non- mainstream practitioner 2) used a support group for health problem 3) received care from D.C.	Of the chronic BP respondents, 39% had used CAM during the past 12 months 74.4% had attended a D.C. in the past 12 months
Giles <sup>126</sup> 2003 Australia	SGPS	HRR SAQ	Visits between 1995 and 2001	1,775	Patients attending a hospital based, multidisciplin ary spinal pain unit	100% with spinal pain; 941 patients could recall when their symptoms began 92.7% reported CBP (>3 months duration)	Visit to D.C.	208/1,175 (11.7%) were managed with chiropractic manipulation
Ong <sup>136</sup> 2005 U.K.	CS	SAQ	3 months	1,377	Randomly selected adults in 4 counties of England	100% had back pain, including sciatica, lumbago and disc problems	Visit to practitioner	In the past 3 months 11.4% of respondents had sought osteopathy or D.C. care, and 2% had sought osteopathy or D.C. care and PT care

**Table 13B. Utilization of chiropractic/manipulation in persons with unspecified back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Bruce <sup>10</sup> 2005 U.S.	Not collected	Not reported but data presented indicated respondents had used 1 or more CAM therapy
Cherkin <sup>44</sup> 2002 U.S.	NSBP	NSCAM
Hawk <sup>25</sup> 2000 U.S.	NSBP	NSCAM
Hurwitz <sup>29</sup> 1997 U.S.	Not reported	Not reported
Shekelle <sup>34</sup> 1995 U.S.  Shekelle <sup>43</sup> 1995 U.S.	Not reported	Not reported
Shekelle <sup>38</sup> 1991 U.S.	Not reported	Not reported
Sherman <sup>15</sup> U.S. 2006	Not reported	Physiotherapeutics (hot, cold, electrical stimulation, ultrasound) Arizona 5% Massachusetts 4%

Abbreviations: CAM = Complementary and Alternative Therapy; D.C. = Doctor of Chiropractic; GP = General Practitioner; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; PT = Physical Therapist

**Table 13B. Utilization of chiropractic/manipulation in persons with unspecified back pain (continued)**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies conducted outside the United States</b>		
Foltz <sup>118</sup> 2005 Canada	CAM users reporting visit to: Any physician: 6.2% (95% CI 6.0-6.4) GP: 5.1% (95% CI 5.0-5.3) Specialists: 1.1% (95% CI 1.0-1.2) PT: 2.4% (95% CI 2.2-2.4) Psychologists: 0.3% (95% CI 0.3-0.3)	Concurrent use evident but data not stratified by type of CAM therapy
Giles <sup>126</sup> 2003 Australia	Not reported	Not specified
Ong <sup>136</sup> 2005 U.K.	Not reported	11.4% of respondents had sought osteopathy or D.C. care, and 2% had sought osteopathy or D.C. care and PT care

**Table 14A. Utilization of chiropractic/manipulation in persons with low back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Carey <sup>9</sup> 1995 U.S.	CS	TI	Past 12 months	269/4,437 (3.9%) CLBP 186/289 analyzed for care seeking	General population	100% with CLBP (functionally limited for >3 months or >25 episodes of back pain)	Visit with health provider, lifetime prevalence	24.6% attended a D.C. mean visits 15.7 22% received SMT
Carey <sup>31</sup> 1996 U.S.	CS	TI	Past 12 months	485 acute LBP 180 saw D.C. or M.D.	Adults	At least one occurrence of acute severe LBP in 1991	Visit to practitioner	13.6% (66) attended a D.C. during their most recent episode of pain
Carey <sup>27</sup> 1999 U.S.	SGPS	TI	Followed for 22 months after initial episode of LBP	6 months: n = 921 22 months: n = 754 (81.9%)	Patients presenting with acute LBP	Recurrent episodes from 6 to 22 months	Visit to practitioner	Chiropractic care: 6 months: 354/921 (38.4%) 22 months: 294/754 (38.9%)

Abbreviations: AD = administrative database; ACBP = acute low back pain; CAM = Complementary and Alternative Medicine; CLBP = Chronic low back pain; CS = Cross-sectional; CT = complementary therapy D.C. = Doctor of Chiropractic; FI = Face to face interview; HRR = Health record review; LBP = Low back pain; M.D. = Medical Doctor; MT = massage therapist; NP = Naturopathic Physician; OP = occupational therapy; PT = physical therapist; SAQ = Self-administered questionnaire; SGPS = Single group prospective study; SMT = spinal manipulative therapy; TI = Telephone interview; U/S = ultrasound



**Table 14A. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Cote <sup>17</sup> 2005 U.S. and Canada	SGPS	SAQ	6 months	1,017/1,104 (92%) received health care	Workers with incident episodes of LBP	All subjects made a workers' compensation claim for LBP, with or without leg pain or sciatica	Visit to practitioner	During the first 4 to 16 weeks after an episode of occupational LBP 4.1% attended a D.C. only
Feuerstein <sup>19</sup> 2004 U.S.	CS	TI and diaries	Not reported	Treated for back pain 1987: 1,053 1997: 1,082	Adults	All responders had non- specific LBP; 1987: 51.23% acute 1997: 53.22% acute	Visit to practitioner	1987: 40.48% of respondents sought D.C. care for mean 9.2 visits 1997: 30.63% of respondents sought D.C. care for mean 7.8 visits
Gilkey <sup>41</sup> 2002 U.S.	SGPS	SAQ	Recall 2 weeks, 1 year and lifetime	335	Hispanic (His):241 non-Hispanic (nHis):94 reported continuous LBP His = 15% nHis = 32%	Reported continuous LBP His = 15% nHis = 32%	Visit to practitioner	9.9% attended a D.C. 3% His went to D.C. 28% nHis went to D.C.

**Table 14A. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Study Design</b>	<b>Reporting Mode</b>	<b>Timing of CAM Visit</b>	<b>Sample Size</b>	<b>Population</b>	<b>Clinical Presentation</b>	<b>Episode of Care</b>	<b>Outcomes</b>
Hurwitz <sup>28</sup> 1998 U.S. and Canada  Companion to Coulter <sup>21</sup> 2002 U.S. and Coulter <sup>42</sup> 2005 U.S.	Retro Rev	HRR	Records from 1985 to 1991	1,397 charts	1,397 charts from U.S. D.C.'s offices	65.9% sought care for LBP (21.2% >6 months duration) 42.8% sought care for face and neck pain 20.0% sought care for mid- back pain	A period of time with no more than 30 days between visits	920 patients with LBP: 84.0% received SMT Median duration of chiropractic treatment for LBP U.S. sites 29 days; mean 61.7 days Median visits 7; mean 15.6 visits
Jette <sup>35</sup> 1994 U.S.	CS	TI and SAQ	Out patient visits over 1 year	2,328	Patients discharged from outpatient PT services (private practice and hospital)	Primary reason for seeking care was either sprain/pain of the lumbar back or degenerative disk disease	Visit to practitioner	33.5% received manual therapy either in isolation or combined with other treatment
Lind <sup>16</sup> 2005 U.S.	Retro Rev	AD	Out patient visits over 1 year	104,358/ 601,044 (17.4%) had back pain and were eligible for study	Individuals enrolled in health insurance plans and allowed outpatient visits	Back pain	Visit to practitioner	46% LBP attended a D.C. 33% attended only a D.C. Median of D.C. visits: 4

**Table 14A. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Study Design</b>	<b>Reporting Mode</b>	<b>Timing of CAM Visit</b>	<b>Sample Size</b>	<b>Population</b>	<b>Clinical Presentation</b>	<b>Episode of Care</b>	<b>Outcomes</b>
Long <sup>11</sup> 1996 U.S.	SGPS	SAQ	Past 12 months	2,374/4,171 (56.9%) had complete data and followup	Adult patients presenting for orthopedic surgery or neurosurgery consultation	100% of patients presented with persistent LBP (mean duration of current episode was 2.52 years)	Treatments or visits to CAM practitioner	Prior to their surgical consultation 46.7% patients had consulted a chiropractor, and 41.3% patients had undergone chiropractic manipulation
Metz <sup>40</sup> 2004 U.S.	Retro Rev	AD	Claims data from 1997 to 2001	With coverage 124,727 without coverage 220,949	Members of a health plan for large regional managed care network	With and without coverage for chiropractic– LBP with discopathy or radiculopathy	Rates of episodes of care (per 1,000 member years)	LBP: 64.4% with coverage 57.8% without coverage
Mielenz <sup>30</sup> 1997 U.S.	SGPS	TI	Past 12 months	1,540 had acute LBP	Patients recruited from healthcare providers	100% with acute LBP (<10 week duration)	Visit with a healthcare provider, lifetime prevalence	21% received SMT or an adjustment
Nyiendo <sup>37</sup> 1991 U.S.	SEPS	AD	Disabling back claims filed June to Dec 1985	94	A random sample of adults who filed an insurance claim and attended a D.C. in Oregon	100% with LBP; 49% soft tissue injuries; none had persistent nerve root compromise	Patient visit to the treating physician or hospital or any auxiliary personnel	Over the duration of their claim patients attended a D.C.: 41 visits (SD = 47) average treatment period 53 weeks (SD = 49) 93.6% received manipulation as part of their treatment

**Table 14A. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
Nyiendo <sup>24</sup> 2000 U.S.	SGPS	SAQ TI	Past 12 months	38	Patients recruited from clinics M.D.: 45 D.C.: 93	100% with chronic LBP (>6 weeks duration)	Patient visit to the treating physician or hospital or any auxiliary personnel	Over the duration of their claim, patients attended a D.C.: 41 visits (SD = 47) Mean treatment period was 53 weeks (SD = 49) 93.6% received manipulation as part of their treatment
Nyiendo <sup>22</sup> 2001 U.S.	SGPS	SAQ HRR	Past 12 months	268	M.D. clinics: n = 121 D.C. clinics: n = 147	100% with chronic LBP and sciatica (>6 weeks duration)	Visit to practitioner	Of those who received adjustments, 61% received full spine adjustment and 39% received an adjustment only to the lumbopelvic region Mean no. of visits to D.C. was 4.3 (SD=3.0)
Nyiendo <sup>23</sup> 2001 U.S.	SGPS	SAQ HRR	Past 12 months	835	M.D. clinics: n = 309 D.C. clinics: n = 526	100% with chronic LBP (>6 weeks duration)	Visit to practitioner	Mean # visits to D.C.: 8.72 (SD=9.27) 91.8% attending a D.C. received spinal manipulation
Shekelle <sup>33</sup> 1995 U.S.	Retro Rev	HRR	Past 12 months	80 patients records were selected (10 from each of 8 chiropractic practices)	Patient record from random sample of chiropractic practices	100% with LBP (56% <3 weeks duration; 25% >13 weeks duration)	First visit between specified interval	79% SMT 77% non-thrust 25% massage 12% U/S 8% electro-acupuncture
Sherman <sup>18</sup> 2004 U.S.	CS	TI	Past 12 months	249	Individuals registered with health care organizations	100% with chronic LBP (>3 months duration)	Reported 'ever tried'	45% surveyed had previously tried chiropractic for LBP

**Table 14A. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Study Design</b>	<b>Reporting Mode</b>	<b>Timing of CAM Visit</b>	<b>Sample Size</b>	<b>Population</b>	<b>Clinical Presentation</b>	<b>Episode of Care</b>	<b>Outcomes</b>
Stano <sup>32</sup> 1996 U.S.	Retro Rev	AD	Claims data from 1988 to 1990	6,183	Patients with insurance claims	Each patient had a claim with a low back ICD-9-CM code	ICD9 code	45% surveyed had previously tried chiropractic for LBP
Stano <sup>20</sup> 2002 U.S.  Companion to Nyiendo <sup>22,23</sup> 2001 U.S.	SGPS	HRR SAQ	Past 12 months	2,872 total 922 medical patients 1,950 chiropractic patients	Patients with ALBP and CLBP	Acute and chronic ambulatory LBP of mechanical origin	Frequency of therapy procedure codes used	8,712 regional manipulations 577 supplementary manipulations 406 manipulations of the spine
Wasiak <sup>39</sup> 2006 U.S.	Retro Rev	AD	Claims data from 1999 to 2002	13,734	Workman's Compensatio n claimants	100% with a compensable low back injury (of which 81% claimed low back strain)	At least one visit to a D.C. in a 4-year period	64.8% had all compensable D.C. services in 1 year Median annual visits to a D.C. 5 to 15
<b>Studies from outside the United States</b>								
Armstrong <sup>132</sup> 2003 U.K.	Retro Rev	HRR	Patient records from 1995- 1996	200	Patients in the U.K.	100% with LBP lasting more than 24 hours, with or without referral of symptoms into the lower extremities	Visit to a physio- therapist	3% of patients received manipulation
Burton <sup>122</sup> 2004 U.K.	SGPS	FI SAQ	12 months	151	Patients attended for manipulative care at a single U.K. clinic	100% presented with LBP	Visit to osteopath	76 respondents sought further care, of these 56.5% consulted an osteopath again

**Table 14A. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
Caswell <sup>128</sup> 2002 U.K.	CS	SAQ	NR	50	U.K. patients not using CAM	100% with chronic LBP (at least 6 months duration)	Visit to CAM practitioner	40% using CT attended an osteopath 40% using CT attended a chiropractor
Hartvigsen <sup>134</sup> 2002 Denmark	CS	SAQ	Ever have treatment	176 chiropractic clinics and 1,897 patients	D.C. clinics	Neck or back pain	Any visit to a chiropractor	Patients seeing D.C. Neck: 9.2% Thorax: 7:0 % Low back: 40.7%
Hurwitz <sup>28</sup> 1998 Canada and U.S.  Companion to Coulter <sup>21</sup> 2002 U.S.  Coulter <sup>42</sup> 2005 U.S.	Retro Rev	HRR	Episodes of care from 1985 to 1991	519	Charts from Canadian D.C.'s offices	75.1% LBP (20.3% >6 months duration) 29.7% face and neck pain 13.1% mid- back pain	Period of time with no more than 30 days between visits	Of 390 patients with LBP: 80.8% received SMT Median duration of chiropractic treatment: Canadian sites 29 days mean 57.3 days Median visits: Canadian sites 6; mean 10.5 visits
Jacobs <sup>133</sup> 2004 Canada	CS	FI	Past 12 months	4,158	Adults	100% with CLBP (duration of ≥6 months)	Any visit to practitioner in past 12 months	32.1% of respondents attended a D.C.

**Table 14A. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
Kilaver <sup>124</sup> 1997 Norway	CS	SAQ	Any visit to a D.C.	Within D.C. practices: 2,154 patients; 631 (29.3%) referred by M.D.; 1,523 (70.7%) non-referred	Adult chiropractic patients	LBP	Ever seen a D.C.	LBP: 59.4% referred 61.5% non-referred 58% from 0 to 3 months duration Sciatica: 11.3% referred sciatica 12.7% non-referred sciatica 44% from 0 to 3 months duration
Scheurmier <sup>129</sup> 1998 U.K.	SGPS and Retro Rev	HRR	Past 4 months	484	Patients from GP practices	100% with acute LBP (duration <6 weeks)	Visit to practitioner	Referred to D.C.: 2% before project 28% during project Mean project visits 5.7 Referred to OT: 0% before project 25% during project Mean project visits 4.2 Referred to PT: 72% before project 21% during project Mean project visits 5.0
Walker <sup>119</sup> 2004 Australia	CS	SAQ	Past 6 months	1,913/ 2,748 (69.6%) 1,228/ 1,913 (64.1%) ≥1 episode back pain	Individuals from the electoral roll	100% reported LBP in the last 6 months	Visit to CAM practitioner	547/1,228 (44.5%) sought care for LBP Of those who sought care, 78/547 (6.4%) exclusively from a D.C.

**Table 14B. Utilization of chiropractic/manipulation in persons with low back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Carey <sup>9</sup> 1995 U.S.	NSCAM	NSCAM
Carey <sup>31</sup> 1996 U.S.	NSCAM	NSCAM
Carey <sup>27</sup> 1999 U.S.	Patients with initial consult with D.C. more than twice the Number of patients seeking M.D. care D.C. vs M.D. OR = 2.5 (95% CI, 1.5-4.3)	NSCAM
Cote <sup>17</sup> 2005a U.S. and Canada	9.7% attended a M.D., D.C., & PT 5.3% attended a M.D. & D.C. 1.2% attended a D.C. & PT	Not reported
Feuerstein <sup>19</sup> 2004 U.S.	Not stratified by treatment	NSCAM
Gilkey <sup>41</sup> 2002 U.S.	Not stratified by therapy	No other CAM use reported
Hurwitz <sup>28</sup> 1998 U.S. and Canada  Companion to Coulter <sup>21</sup> 2002 U.S. and Coulter <sup>42</sup> 2005 U.S.	Not applicable only D.C. in study	NSCAM

Abbreviations: AT = Acupuncture Therapy; CAM = Complementary and Alternative Therapy; D.C. = Doctor of Chiropractic; M.D. = Medical Doctor; MT = Massage therapist; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; OR = Odds Ratio; OT = Occupational Therapy; PT = Physical Therapist



**Table 14B. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Jette <sup>35</sup> 1994 U.S.	8.0% received manual therapy and exercises	11.9% received manual therapy, exercises and modalities
Lind <sup>16</sup> 2005 U.S.	Not stratified by therapy 12% of CAM users also saw conventional provider	NSCAM
Long <sup>11</sup> 1996 U.S.	Not stratified by therapy	NSCAM
Metz <sup>40</sup> 2004 U.S.	NSBP	NSCAM
Mielenz <sup>30</sup> 1997 U.S.	Not applicable	NSCAM
Nyiendo <sup>37</sup> 1991 U.S.	Did not look at concurrent use of chiropractic and medical care	NSCAM
Nyiendo <sup>24</sup> 2000 U.S.	Did not look at concurrent use of chiropractic and medical care	NSCAM
Nyiendo <sup>22</sup> 2001 U.S.	Not applicable	NSCAM
Nyiendo <sup>23</sup> 2001 U.S.	Not applicable	NSCAM
Shekelle <sup>33</sup> 1995 U.S.	Not applicable	NSCAM
Sherman <sup>18</sup> 2004 U.S.	Hypothetical question posed in this report	NSCAM

**Table 14B. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Use with Conventional Care</b>	<b>Concurrent use with Other CAM</b>
Stano <sup>32</sup> 1996 U.S.	Examination of medical claims vs chiropractic claims	NSCAM
Stano <sup>20</sup> 2002 U.S.	Not applicable	PT modalities were frequently used with massage and trigger point therapy used most often
Wasiak <sup>39</sup> 2006 U.S.	Not applicable	NSCAM
<b>Studies conducted outside the United States</b>		
Armstrong <sup>132</sup> 2003 U.K.	Not applicable	NSCAM
Burton <sup>122</sup> 2004 U.K.	Not stratified by practitioner	NSCAM
Caswell <sup>128</sup> 2002 U.K.	62% CAM users sought conventional care to manage their pain 36% using conventional treatment plus D.C., OT or AT	NSCAM
Hartvigsen <sup>134</sup> 2002 Denmark	NSBP	NSCAM
Hurwitz <sup>28</sup> 1998 Canada and U.S.  Companion to Coulter <sup>21</sup> 2002 U.S. and Coulter <sup>42</sup> 2005 U.S.	Not applicable only D.C. in study	NSCAM

**Table 14B. Utilization of chiropractic/manipulation in persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Use with Conventional Care</b>	<b>Concurrent use with Other CAM</b>
Jacobs <sup>133</sup> 2004 Canada	NSBP	NSCAM
Kilaver <sup>124</sup> 1997 Norway	Not applicable	NSCAM
Scheurmier <sup>129</sup> 1998 U.K.	NSBP	NSCAM
Walker <sup>119</sup> 2004 Australia	59% attended multiple providers 3.3% from a GP and D.C. 1.5% from a GP, D.C., MT	NSCAM

**Table 15A. Utilization of chiropractic/manipulation in persons with combined neck and back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Fleming <sup>13</sup> 2007 U.S.	CS	FI	Past 12 months	908	Patients receiving opioids for chronic pain	38.4% had chronic LBP (>3 months) 6.8% presented with chronic neck/upper back pain (>3 months)	Visit to practitioner	Of those who attended a D.C. for any complaint the average number of annual visits was 14.1
Hawk <sup>26</sup> 1999 U.S.	CS	TI	Past 12 months	1,511	Respondent s to a 1994 population- based survey	Neck and back pain that required that respondent missed work	Visit to practitioner	44/103 (42.7%) attended a D.C.
Hurwitz <sup>14</sup> 2006 U.S. and Canada	CS	TI	Past 12 months	595/5,183 (11.4%)	Respondent s to a population health survey (Joint Canada/ U.S. Survey of Health 2002-2003)	Neck or back problems responsible for difficulties with performing activities of daily living	Number of visits or contacts with various types of health professionals in the past 12 months	Results for U.S. only: 16.3% of respondents who saw a D.C. were for back or neck problems 9.1% of total sample

Abbreviations: AD = administrative database; ADL = Activities of Daily Living; CLBP = Chronic low back pain; CS = Cross-sectional; D.C. = Doctor of Chiropractic; HRR = Health Records Review; SAQ = Self-administered questionnaire; SGPS = Single group prospective study; TI = Telephone interview

**Table 15A. Utilization of chiropractic/manipulation in persons with combined neck and back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Jarvis <sup>36</sup> 1991 U.S.	Retro Rev	HRR	12-month period	3,062 from 7,551 files (40.6%)	Back injury claims	Various conditions	Visit to D.C. practitioner	D.C.s provided patients with an average of 12.9 treatments over an average of 54.5 days Top 3 diagnoses were: sprain/strain lumbosacral spine (21.4%), sprain/strain cervical (15%) sprain/strain lumber (15%)
Wolsko <sup>12</sup> 2003 U.S.	CS	TI	Past 12 months	644/2,055 (60%)	Individuals who have had neck or back pain in the past 12 months	46% had pain in more than 1 location 38% had LBP only 16% had neck or upper back pain only	Use of CAM therapy or visit to CAM practitioner	19.8% attended a D.C. in the Mean number of visits 8.5
<b>Studies from outside the United States</b>								
Cote <sup>131</sup> Canada 2001	CS	SAQ	Past 4 weeks	2,184 in the sample 1,131 (55%) participated 907/1,131 (80%) had back or neck pain	Health insurance and registration file	100% had back and/or neck pain in the past 6 months	Visit to healthcare provider	215/907 (24.7%) visited a healthcare provider in the past 4 weeks  28.8% saw a D.C. alone

**Table 15A. Utilization of chiropractic/manipulation in persons with combined neck and back pain (continued)**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
Esmail <sup>117</sup> 2007 Canada  Companion to Ramsay <sup>116</sup> 1999 Canada	CS	TI	Past 12 months	Second wave (Esmail): 2,000 respondents response rate 18.8%. 30% reported having back or neck problems	General adult population in Canada	30% reported back or neck problems in the past 12 months	Use of a CAM therapy or visit with a practitioner who is not a medical doctor	41% of respondents with back or neck pain had attended a CAM provider in the past 12 months, most commonly a D.C. 68% of all visits to D.C.s were for back and/or neck pain
Hurwitz <sup>14</sup> 2006 Canada and U.S.	CS	TI	Past 12 months	448/3505 (12.8%)	Population health survey (Joint Canada/ U.S. Survey of Health 2002-2003) who received any chiropractic care	Neck or back problems responsible for difficulties with performing ADL	Number of visits or contacts with various types of health professionals in the past 12 months	Results for Canada only: 20.1% of respondents who saw a D.C. were for back or neck problems 10.4% of total sample
Ramsay <sup>116</sup> 1999 Canada	CS	TI	Past 12 months	1,500	Survey of randomly selected Canadian adults	30% reported back or neck problems in the past 12 months	Use of CAM therapy or visit with a practitioner who is not an M.D.	11% with back or neck problems in the past 12 months attended an alternative provider, most commonly a chiropractor

**Table 15B. Utilization of chiropractic/manipulation in persons with combined neck and back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Fleming <sup>13</sup> 2007 U.S.	NSBP	NSCAM
Hawk <sup>26</sup> 1999 U.S.	NSBP	NSCAM
Hurwitz <sup>14</sup> 2006 U.S. and Canada	85.3% received both D.C. and GP care	Not specified
Jarvis <sup>36</sup> 1991 U.S.	Not reported	Not reported
Wolsko <sup>12</sup> 2003 U.S.	NSCAM 25% had used both complementary medicine and a conventional provider	Used any CAM: from those with back and neck pain, 29% had used CAM alone, concurrent use not specified

Abbreviations: CAM = Complementary and Alternative Therapy; D.C. = Doctor of Chiropractic; GP = General Practitioner; MT = massage therapist; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; PT = Physical Therapist

**Table 15B. Utilization of chiropractic/manipulation in persons with combined neck and back pain (continued)**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies conducted outside the United States</b>		
Cote <sup>131</sup> Canada 2001	7.9% saw a GP and a D.C. 2.8% saw a GP, D.C., and PT 2.8% saw a GP, D.C., MT, and PT	5.1% saw a D.C. and a MT
Esmail <sup>117</sup> 2007 Canada  Companion to Ramsay <sup>116</sup> 1999 Canada	25% had used both complementary medicine and a conventional provider	NSCAM
Hurwitz <sup>14</sup> 2006 Canada and U.S.	87.7% received both D.C. and GP care	Not specified
Ramsay <sup>116</sup> 1999 Canada	25% had used both complementary medicine and a conventional provider	NSCAM



**Table 16A. Utilization of chiropractic/manipulation in persons with thoracic back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Metz <sup>40</sup> 2004 U.S.	Retro Rev	AD	Claims data from 1997 to 2001	People with coverage 37,429 Without coverage 42,372	Members of a health plan for large regional managed care network	With and without coverage for chiropractic care of thoracic spine pain	ICD-9 codes used to identify neuro- muscular pain episodes. All services using any of these codes, with a maximum gap of 45 days between claims were aggregated into 1 episode of care	Rates of episodes of care (per 1,000 member years )  Thoracic pain: 19.8% with coverage 10.0% without coverage
<b>Studies from outside the United States</b>								
Hartvigsen <sup>134</sup> 2002 Denmark	CS	SAQ	Ever have treatment	176 chiropractic clinics and 1,897 patients within these practices	Chiropractic clinics	Neck or back pain	Any visit to a D.C.	Percent of patients seeing D.C. Thorax: 7:0 %

Abbreviations: AD = administrative database; CLBP = Chronic low back pain; CS = Cross-sectional; D.C. = Doctor of Chiropractic; LBP = low back pain; SAQ = Self-administered questionnaire; SGPS = Single group prospective study; TI = Telephone interview

**Table 16B. Utilization of chiropractic/manipulation in persons with thoracic back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Metz <sup>40</sup> 2004 U.S.	NSBP	NSCAM
<b>Studies conducted outside the United States</b>		
Hartvigsen <sup>134</sup> 2002 Denmark	NSBP	NSCAM

Abbreviations: NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy

**Table 17A. Utilization of naturopathic medicine in persons with unspecified back pain**

<b>Author Year Country</b>	<b>Study Design</b>	<b>Reporting Mode</b>	<b>Timing of CAM Visit</b>	<b>Sample Size</b>	<b>Population</b>	<b>Clinical Presentation</b>	<b>Episode of Care</b>	<b>Outcomes</b>
<b>Studies from the United States</b>								
Cherkin <sup>44</sup> 2002 U.S.	SGPS	SAQ	Past 12 months	99 NP 488 eligible practitioners	Practitioner collected patient information	Any condition	Visit to a NP	NP data: 1,817 patient visits Patients reporting 'back symptoms' as primary reason for visit to NP Connecticut: 28/631 (4.4%) Washington: 77/1,186 (6.5%)

Abbreviations: NP = Naturopathic Physician; SAQ = Self-administered questionnaire; SGPS = Single group prospective study

**Table 17B. Utilization of naturopathic medicine in persons with unspecified back pain**

<b>Author Year Country</b>	<b>Use with Conventional Care</b>	<b>Concurrent use with Other CAM</b>
<b>Studies from the United States</b>		
Cherkin <sup>44</sup> 2002 U.S.	NSBP	NSCAM

Abbreviations: CAM = Complementary and Alternative Therapy; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy

**Table 18A. Utilization of naturopathic medicine in persons with low back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Bruce <sup>10</sup> 2004 U.S.	RCT	SAQ	Past 12 months	190 intervention and 231 control subjects	General population with an email account and U.S. residency	Back pain in the past 12 months, no severe back pain symptoms that would be indicative of a very serious back condition or other comorbidity	Baseline: “ever used glucosamine supplement”  1 year: “glucosamine in past 6 months”	Baseline: 87/190 (45.8%) Control: 59/231 (25.5%) p<0.001 End of trial: Intervention: 24/190 (12.6%) Control: 18/231 (7.8%) p = 0.076
Lind <sup>16</sup> 2005 U.S.	Retro Rev	AD	Out patient visits during 2002	104,358 individuals with back pain; 652,593 visits to practitioners	Enrollees aged 18 to 64 in large health insurance plans; enrollees had NOT been hospitalized or undergone surgery for back pain	Back pain	At least one visit for back pain to a CAM provider	1.5% (n = 1,609) saw NP for at least one visit during 2002 0.6% used NP only Median number of visits to an NP was 2 (range = 1 to 4 visits)

Abbreviations: AD = administrative database; CAM = Complementary and Alternative Medicine; CI = Confidence interval; CLBP = Chronic low back pain; CS = Cross-sectional; D.C . = Doctor of Chiropractic; FI = Face to face interview; HRR = Health record review; LBP = Low back pain; M.D. = Medical Doctor; MT = massage therapist; NP = Naturopathic Physician; retro rev = Retro Rev; SAQ = Self-administered questionnaire; SGPS = Single group prospective study; TI = Telephone interview

**Table 18A. Utilization of naturopathic medicine in persons with low back pain (continued)**

<b>Author Year Country</b>	<b>Study Design</b>	<b>Reporting Mode</b>	<b>Timing of CAM Visit</b>	<b>Sample Size</b>	<b>Population</b>	<b>Clinical Presentation</b>	<b>Episode of Care</b>	<b>Outcomes</b>
<b>Studies from outside the United States</b>								
Foltz <sup>118</sup> 2005 Canada	CS	TI	Past 12 months	Complete sample 66,253 Non-specific CBP 11,736 (17.7%) CAM users 3,259 (39%)	Subset from national general sample collected 1996 - 1998 1 of 4 groups identified was "CBP or musculo- skeletal disease"	Chronic BP was diagnosed by a health professional	'CAM users' 1) received or discussed CAM with a non- mainstream practitioner 2) used a support group for health problem 3) received care from D.C.	17.8% homeopathy 6.2% herbal medicine
Hopman <sup>120</sup> 2006 Canada	CS	FI SAQ	5 yr followup	9,423	General population randomly selected from 9 cities	Ever had back pain		

**Table 18B. Utilization of naturopathic medicine in persons with low back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Bruce <sup>10</sup> 2004 U.S.	Not applicable	Chiropractic: both groups 64% yoga (~25%), acupuncture (~20%), magnets (~16%)
Lind <sup>16</sup> 2005 U.S.	Concurrent use possible but not specified by therapy 12% (n = 12,287) were "Mixers" meaning that they saw CAM and conventional providers	NSCAM
<b>Studies conducted outside the United States</b>		
Foltz <sup>118</sup> 2005 Canada	6.2% CAM users with chronic back also saw a physician	NSCAM
Hopman <sup>120</sup> 2006 Canada	Not applicable	NSCAM

Abbreviations: CAM = Complementary and Alternative Therapy; D.C. = Doctor of Chiropractic; GP = General Practitioner; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; PT = Physical Therapist

**Table 19A. Utilization of naturopathic medicine in persons with combined neck and back pain**

Author Year Country	Study Design	Reporting Mode	Timing of CAM Visit	Sample Size	Population	Clinical Presentation	Episode of Care	Outcomes
<b>Studies from the United States</b>								
Boon <sup>137</sup> 2004 U.S.	SGPS	TI HRR	Conse- cutive patient visits in 1998 and 1999	NP 99 patients 1,817	Practice patterns of 99 NP	Various conditions	Visit to a NP	'Back symptoms' primary reason for patient visits in: Connecticut 4.4% Washington 6.5% 'Neck symptoms' primary reason for visits in: Connecticut 2.3% Washington 3.3%
Wolsko <sup>12</sup> 2003 U.S.	CS	TI	Past 12 months	644/2,055 (31.3%) respondents reported back pain	Individuals who have had neck or back pain in the past 12 months	46% had pain in more than 1 location 38% had LBP only 16% had neck or upper back pain only	Use of a CAM therapy or visit with CAM practitioner in the past 12 months	Homeopathy: 17/644 (2.6%) Vitamins: 12/644 (1.8%) Herbs: 8/644 (1.3%) Special diet: 8/644 (1.2%) Mean # of visits to CAM for in the past 12 months: Special diet therapy 2.7 Homeopathy 1.0
<b>Studies from outside the United States</b>								
Walker <sup>119</sup> 2004 Australia	CS	SAQ	Past 6 months	1,913/2,748 (69.6%) response 1,228/1,913 (64.1%) ≥1 episode of back pain	Individuals from the electoral roll in Australia	LBP	Visit to a CAM practitioner	2.6% of all visits for LBP over 6 months were to a NP No treatments specific to NP were listed

Abbreviations: CAM = Complementary and Alternative Medicine; CS = Cross-sectional; D.C. = Doctor of Chiropractic; FI = Face to face interview; HRR = Health record review; LBP = Low back pain; NP = Naturopathic Physician; SAQ = Self-administered questionnaire; SGPS = Single group prospective study; TI = Telephone interview



**Table 19B. Utilization of naturopathic medicine in persons with combined neck and back pain**

Author Year Country	Use with Conventional Care	Concurrent use with Other CAM
<b>Studies from the United States</b>		
Boon <sup>137</sup> 2004 U.S.	Not reported	NSCAM
Wolsko <sup>12</sup> 2003 U.S.	25% had used both complementary medicine and a conventional provider for back or neck pain	NSCAM
<b>Studies conducted outside the United States</b>		
Walker <sup>119</sup> 2004 Australia	Not stratified by therapy	NSCAM

Abbreviations: CAM = Complementary and Alternative Therapy; D.C. = Doctor of Chiropractic; GP = General Practitioner; NSBP = Data not stratified by back pain; NSCAM = Not stratified by CAM therapy; PT = Physical Therapist

**Table 20. Quality characteristics of cross-sectional studies using self report utilization data from U.S.**

<b>Study</b>	<b>Sample Selection</b>	<b>Mode of Administration</b>	<b>Pre-Testing of Survey</b>	<b>Recall Period</b>	<b>Response Rate (raw proportion)**</b>
Burke <sup>45</sup> 2006	Random national sample	Face to face interview	Yes	Lifetime and past 12 months	74.3%
Carey <sup>9</sup> 1995 Carey <sup>31</sup> 1996	Random sample from North Carolina residents	Telephone interview	Yes	1 year	n = 3,505/4,437 (79%)
Eisenburg <sup>5</sup> 1998 McCaffrey <sup>139</sup> 2004 Saper <sup>138</sup> 2004 Wolsko <sup>140</sup> 2004 Wolsko <sup>12</sup> 2003	Random national sample	Telephone interview	Not reported	Lifetime use Past 12 months	60% overall weighted response rate among eligible respondents
Feuerstein <sup>19</sup> 2004	National probability sample	Telephone interview and respondent's completed diaries	No, data for this study was extracted from the 1987 National Medical Expenditure Survey (NMES) and the 1997 Medical Expenditure Panel Survey (MEPS)	Not reported	80.1% for the NMES n = 34,459 74.1% for the MEPS n = 2,636
Fleming <sup>13</sup> 2007	Systematic sample	Face-to-face interview	No, but all questionnaires were previously validated	1 year	n = 1,009/1,252 (80%)
Hawk <sup>26</sup> 1999	Random sample	Telephone interview	No, data for this study was extracted from the 1994 Heartland Poll	1 year	n = 2,102 (66.4%)
Hurwitz <sup>14</sup> 2006	Random sample	Telephone interview	Joint Canada/US Survey of Health	12 months	66% in US
Hurwitz <sup>29</sup> 1997	Multistage sampling process	Telephone interview	No, data for this study was extracted from the 1989 National Health Interview Survey	2 weeks	n = 116,929 (94.9%)

\* the sample is described as randomly selected, but no details are provided

\*\* if the denominator was not provided only the number of respondents (n) is reported

**Table 20. Quality characteristics of cross-sectional studies using self report utilization data from U.S. (continued)**

<b>Study</b>	<b>Sample Selection</b>	<b>Mode of Administration</b>	<b>Pre-Testing of Survey</b>	<b>Recall Period</b>	<b>Response Rate (raw proportion)**</b>
Jette <sup>35</sup> 1994	Not reported	Telephone interview and mailed survey	No, data for this study was extracted from a national survey of facilities that provided outpatient physical therapy services	Present	n = 2,329 (90%)
Sherman <sup>18</sup> 2004	Not reported	Telephone interview	Not reported	6 months	Not reported n = 249

**Table 21. Quality characteristics of cross-sectional studies using self report utilization data from non-American Studies**

<b>Study</b>	<b>Sample Selection</b>	<b>Mode of Administration</b>	<b>Pre-Testing of Survey</b>	<b>Recall Period</b>	<b>Response Rate (raw proportion)**</b>
Caswell <sup>128</sup> 2002	Recruited from private clinics*	Not reported	Not reported	Present	n = 100/100 (100%)
Cote <sup>131</sup> 2001	Random sample from Saskatchewan Health Insurance	Mailed survey	NR, but all questionnaires were previously validated	6 months for complaints 4 weeks for care-seeking	n = 1,131/2,184 (55%)
Esmail <sup>117</sup> 2007  Ramsay <sup>116</sup> 1999	Random sample	Telephone interview	Survey was previously administered from Ramsey 1999	1 year	2005:18.8% (2,000 of 10,624)  1998: 25.7% (n = 1,500)
Foltz <sup>118</sup> 2005	Random sample	Telephone interview	No, data for this study was extracted from the 1996–1997 National Population Health Survey	1 year	Not reported (n = 66,999)
Hartvigsen <sup>123,134</sup> 1996	201 Chiropractic clinics in Denmark	Mailed questionnaire	No	Current episode of care	88% of clinics
Hurwitz <sup>14</sup> 2006	Random sample	Telephone interview	NR, Joint Canada/US Survey of Health (JCUSH)	12 months	50% in Canada
Hopman <sup>120</sup> 2006	Randomly selected national sample	Face to face interview	Yes	Lifetime use of glucosamine use on a regular basis	83% women and 77% men from original baseline sample
Jacobs <sup>133</sup> 2004	Not reported	Not reported but likely interview	No, data for this study was extracted from the 2000 Canadian Community Health Survey	1 year	Not reported (n = 130,880)

\* the sample is described as randomly selected, but no details are provided

\*\* if the denominator was not provided only the number of respondents (n) is reported

**Table 21. Quality characteristics of cross-sectional studies using self report utilization data from non-U.S. Studies (continued)**

<b>Study</b>	<b>Sample Selection</b>	<b>Mode of Administration</b>	<b>Pre-Testing of Survey</b>	<b>Recall Period</b>	<b>Response Rate (raw proportion)**</b>
Kilaver <sup>134</sup> 2002	Practices of Norwegian Chiropractors	Questionnaire	No	Current episode of care	NR
Ong <sup>136</sup> 2005	Random sample	Mailed survey	No, data for this study was extracted from the third Oxford Healthy Lifestyle Survey (1997)	3 months	64% (n = 8,889)
Sibbritt <sup>127</sup> 2007	Random sample; those reporting use of acupuncture selected	NR	Yes	Last 12 months	83% of women aged 55 or older 4.2% of sample reported use of acupuncture
Walker <sup>119</sup> 2004	Age, gender, and state stratified random sample	Mailed survey	Yes	6 months	1,914/2,768 (69.1%)

**Table 22. Summary of studies evaluating costs in persons with low back pain**

<b>Author Year</b>	<b>Study Design Back Pain Cost Study Sample Size</b>	<b>Costs Descriptions</b>	<b>Direct Costs Outcomes</b>	<b>Insurance</b>
Carey <sup>53</sup> 1995	SGPS  ALBP  CID  Urban n = 310 Rural n = 296	Costs in 1995 USD  Outpatient costs per episode of care  Outpatient costs per episode of LBP including: 1) visits, 2) X-rays and other imaging, 3) medications, 4) PT, and 5) other (D.C.)  Data on the charges for outpatient services was based on average state wide charges assigned by a large health insurance carrier	Mean Total Costs  Adjusted for baseline function Mean Costs	Proportion that had coverage as a function of practitioner
Sundararajan <sup>54</sup> 1998	As above (Carey)  D.C. as possible only index provider more than one index provider	As above (Carey)  Logistic Regression model to predict cost for seeing only index provider	Adjusted mean cost for seeing only index provider	Not specified

Abbreviations: ALBP = acute low back pain; AT = acupuncture therapy; CEA = Cost effectiveness Analysis; CER1\* = incremental cost effectiveness ratio with adjusted mean difference in outcomes between D.C. and M.D. with office costs used in the numerator; CER2\* = incremental cost effectiveness ratio with adjusted mean difference in outcomes between D.C. and M.D. with total costs used in the numerator; CI = Confidence interval; CID = Cost identification; CLBP = chronic low back pain; CON = Conventional providers; CS = Cost study; D.C. = Doctor of chiropractic; HMO = health maintenance organization; ICD = international classification of diseases; LBP = low back pain; M.D. = Medical doctor; MDF = mean difference; MT = massage therapist; NRM = non-referred medical; OP = osteopathic physician; OS = Orthopedic Surgeon; PCP = primary care provider; PM = Physical modalities; PT = Physical therapist; RCT = randomized controlled trial; SD = standard deviation; SE = standard error; USD = United States dollar

**Table 22. Summary of studies evaluating costs in persons with low back pain (continued)**

<b>Author Year</b>	<b>Study Design Back Pain Cost Study Sample Size</b>	<b>Costs Descriptions</b>	<b>Direct Costs Outcomes</b>	<b>Insurance</b>
Cherkin <sup>55</sup> 2003	RCT  ALBP  CID  n = 1,580/1,633 (97%)  D.C. vs PT vs educational booklet	Costs in 1995 USD  Costs include all those charged to the HMO: non-study treatments (>15 visits) were covered by the subjects health insurance with a \$5 or \$10 copayment	Costs per unit for visit: (mean cost per subject) Mean costs over a 2-year period  Indirect Costs "Out of pocket expenses" not included	Not applicable as all expenses covered by study
Eisenburg <sup>56</sup> 2007	RCT  ALBP  CID (data available for CEA)  Usual Care n = 148 Choice Care n = 296  Usual care (M.D./medication) vs choice care (D.C., AT, MT)	Costs in 2003 USD  Costs were assigned using the Medicare reimbursement for encounter and the "Red Book" for prescriptions	Average and median Total costs for treatment: comparing usual care to choice care.  12 weeks Before study enrolment >12 after study enrolment  For choice group mean reimbursement to provider	Not applicable all covered by private insurance
Haas <sup>57</sup> 2005	SGPS  ALBP & CLBP  CEA  n = 2,827 patients from 69 D.C. and 111 M.D. practices  D.C. vs M.D.	Costs in 1995 USD  Costs included office based visits, and imputed costs for imaging, surgical consultation, and PT	Total unadjusted costs 3 months acute vs chronic 12 months acute vs chronic  3 months acute vs chronic CER1* pain and disability CER2* pain or disability	Proportion with none or any type of insurance  Chronic patients vs acute patients  Compared D.C. vs M.D. patients

**Table 22. Summary of studies evaluating costs in persons with low back pain (continued)**

Author Year	Study Design Back Pain Cost Study Sample Size	Costs Descriptions	Direct Costs Outcomes	Insurance
Kominski <sup>58</sup> 2005	RCT  LBP (acuity not specified)  CID  n = 664/681 (97.5%) completed 28-month followup  D.C. vs D.C. + PM vs M.D. vs M.D. + PT	Costs expressed as USD (year not specified) for care over 18 months  Costs included charges for diagnostic and therapeutic modalities from any provider. Some patients did have to make co-payments. Pharmaceutical costs were not included	Mean costs per total OP costs over 18 months  Adjusted mean total costs per treatment  Stratified by provider type Relative cost differences	Not applicable; all members of HMO
Lind <sup>16</sup> 2005	Retrospective database  LBP  CID  n = 104,358/601,044 (17.4%) had back pain and were eligible for the study  Conventional vs CAM only (D.C., AT, ND, MT) vs Mixers (Conventional and CAM)	Costs in 2002 USD  Costs included maximum allowed amount by the insurance company; these costs may have included visits, and procedures allowed by the insurance company policy	Mean costs per visit Mean total expenditures	Not applicable; all members of HMO



**Table 22. Summary of studies evaluating costs in persons with low back pain (continued)**

Author Year	Study Design Back Pain Cost Study Sample Size	Costs Descriptions	Direct Costs Outcomes	Insurance
Nyiendo <sup>37</sup> 2005	Case control  Disabling LBP  CID  D.C. n = 94 M.D. n = 107  D.C. vs M.D.	Costs in USD (year not specified). Costs include treatment, diagnostic tests and drugs.	Direct Costs: All cases: % of total costs D.C. vs M.D.: All cases: Mean dollars per case D.C. vs M.D.  Indirect Costs Not evaluated	Not applicable all participants on workers compensation
Stano <sup>20</sup> 2002	SGPS  ALBP and CLBP  CID  Total n = 2,872 D.C. n = 1,524 M.D. n = 739 NRM n = 611 RM n = 128  D.C. vs M.D. vs NRM	Costs in 1995 USD  Current Procedural Terminology was converted to relative value units for D.C. and M.D. care and 1995 Medicare conversion factor	Direct Costs: First episode mean total payments First episode mean outpatient payments  Multiple Episodes: Mean total payment for first 2 episodes Mean outpatient payments for first 2 episodes  Indirect Costs: Not evaluated	Proportions of patients with different coverage stratified by provider type

**Table 22. Summary of studies evaluating costs in persons with low back pain (continued)**

Author Year	Study Design Back Pain Cost Study Sample Size	Costs Descriptions	Direct Costs Outcomes	Insurance
Stano <sup>32</sup> 1995	Retrospective database collected from July 1988 to June 1990  LBP  CID  n = 43,476 patients based on back ICD codes; 6,183 patients and 8,018 episodes of care  D.C. vs M.D.	Costs in USD  Episode of care includes all health services incurred to treat back condition; in some cases this may involve cost associated with other illnesses.	First episode costs mean total payments First episode costs mean outpatient payments  Multiple episodes Mean total payment for first 2 episodes Mean outpatient payments for first 2 episodes	Proportion with additional vs basic coverage.
Smith <sup>59</sup> 1996	Retrospective database  Recurrent LBP  CID  Patients with recurrences n = 1,215/7,077  D.C. vs M.D.	Costs in USD for total payments estimated for persons with recurrent episodes.	Costs first episode provider Total costs both 1 <sup>st</sup> and 2 <sup>nd</sup> episodes  Costs first and second episode provider Costs for patients with 3 episodes of care	Not reported
Wasiak <sup>39</sup> 1998	Retrospective database 1999 to 2002  LBP  CID  n = 8,894/13,734  D.C. across 7 states	Costs in 1999 USD  Costs included visits and all other services performed on the same day and all costs associated with services for chiropractic care. Costs were adjusted to constant year dollars using the medical care component of the Consumer Price Index.	Mean cost for individual (adjusted for geography) for D.C. for 7 states  Mean individual cost per visit (adjusted for geography)	Not applicable all on workers compensation

**Table 22. Summary of studies evaluating costs in persons with low back pain (continued)**

<b>Author Year</b>	<b>Study Design Back Pain Cost Study Sample Size</b>	<b>Costs Descriptions</b>	<b>Direct Costs Outcomes</b>	<b>Insurance</b>
Williams <sup>60</sup> 1998	Retrospective database 1988 to 1992  CLBP  CID  n = 520/29,056  By service type: D.C., PT, Miscellaneous non- medical (AT, MT, other)	Costs in USD  Lost time injury costs, subdivided by health care services. Costs were presented in terms of duration of work disability for LBP from worker's compensation claim data from the National Council on Compensation Insurance	D.C. Mean Costs as a function of <30 days, 30-90 days, 91-180 days, >180 days,  Miscellaneous (AT, MT, other) Mean Costs <30 days, 30-90 days, 91-180 days, >180 days  PT Mean Costs	Not applicable all on workers compensation

**Table 23. Summary of studies evaluating costs in persons with unspecified back pain or combined neck and back pain**

Author Year	Study Design Back Pain Cost Study Sample Size Comparison	Costs Descriptions	Direct Costs Outcomes	Insurance
Jarvis <sup>36</sup> 1991	Retrospective database and chart extraction 1986  Combined back pain  CID  n = 3,062/7,551 (40.6%)  M.D. vs D.C. Stratified by ICD	Costs in 1985 USD  Costs included costs for care and costs for compensation.	Compensation costs Costs of care  Indirect Costs Not evaluated	NA

Abbreviations: CID = Cost identification; D.C. = Doctor of chiropractic; HMO = health maintenance organization; ICD = international classification of diseases; IT = internist; M.D. = Medical doctor; OP = osteopathic physician; OS = Orthopedic Surgeon; PCP = primary care provider

**Table 23. Summary of studies evaluating costs in persons with unspecified back pain or combined neck and back pain (continued)**

Author Year	Study Design Back Pain Cost Study Sample Size Comparison	Costs Descriptions	Direct Costs Outcomes	Insurance
Shekelle <sup>34</sup> 1995	SGPS 3 to 5 year interval  Unspecified back pain  CID  1,020 episodes of care by 686 persons and 8,825 visits  Providers included: D.C., PCP, OS, IT, OP, Other	Costs in 1985 USD  Total costs included hospital care, physician services, drugs, services, injections, supplies etc.	Mean cost per visit  Mean total cost per episode  Mean cost per outpatient episode  Indirect Costs Not evaluated	Proportion with none or any type of insurance  Chronic patients vs acute patients  Compared D.C. vs M.D. patients
Legoretta <sup>61</sup> 2004	Retrospective database 1997–2001  Combined neck and back pain  CID  707,690 with D.C. coverage/ 1,001,995 without coverage: from these 141,616 had D.C. coverage and 189,923 did not. Comparison: members of insurance plan with and without D.C. coverage	Costs in USD (year not specified).  Costs included outpatient services, imaging methods, lumbar spine surgical procedures, and inpatient stays. Physiotherapy and drug costs were excluded	Total cost per patient over 4 years (all episodes):  Average cost per episode over 4 years  Indirect Costs Not evaluated	Patients with and without coverage for D.C.

## Chapter 4. Discussion

### Summary of the Evidence

In this systematic review we evaluated a series of broad questions related to the utilization of CAM therapies in persons with back pain. Unlike previous reviews,<sup>62</sup> we found that the majority of studies did differentiate the various types of CAM with respect to use. However, we found that approximately one-third of the literature on patterns of use did not report outcomes stratified for those with back pain. Although, several of the U.S. and non-U.S. studies were based on well conducted national sample cross-sectional surveys, CAM utilization for persons with back pain was not well detailed, despite having been identified as a high user group.

### Utilization of CAM Therapies

A limited number of publications (n = 8) for both the U.S. and non-U.S. countries evaluated the relative utilization of CAM therapies for persons with back pain. Our criteria for selection of studies included the evaluation of a minimum of four different CAM modalities. In both U.S. and non-U.S. studies, chiropractic/spinal manipulation, followed by massage, and then acupuncture were reported as the most frequently used CAM therapies by persons with back pain. In many of the studies most subjects reported using more than one CAM therapy which would seem consistent with reporting lifetime use. These studies focused primarily on chronic low back or unspecified back pain, with none evaluating acute back pain. The timeframe for use and the manner in which the CAM therapies were probed are important factors accounting for the range of utilization rates observed. Future research should evaluate the degree of overlap in the use of different CAM therapies to better evaluate relative utilization. This may be particularly important for persons with chronic back pain that is characterized by recurrent episodes of disabling symptoms. Differentiating patterns of relative use for acute versus chronic/recurrent back pain populations is important in future evaluation of relative use of these CAM therapies.

The number of studies evaluating trends over time in the use of CAM therapies in back pain patients is limited, particularly for U.S. studies (n = 2). These studies would suggest that both CAM use in general and CAM practitioner visits for back pain have not shifted dramatically over time. More research is required to establish the nature of trends in use as a function of the anatomical back region, the duration of the back pain, and the specificity of both the CAM therapy and the practitioner.

Because so few studies evaluated relative CAM utilization, we explored patterns of use for individual CAM therapies and stratified these by U.S. versus non-U.S. studies. We focused on the four most frequently used provider-based therapies including: spinal manipulation/chiropractic, massage, acupuncture, and naturopathic medicine. In general, the patterns of utilization and the flaws within the literature were similar for U.S. and non-U.S. publications, with minor variations in the provider types for the later.

Our review indicates that chiropractic care/spinal manipulation is the most commonly reported and sought CAM therapy by persons with back pain in the U.S. and other western countries. It is also the most commonly evaluated modality within the U.S. Mean number of

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Appendixes and evidence tables cited in this report are provided electronically at <http://www.ahrq.gov/downloads/pub/evidence/pdf/backpaincam/backcam.pdf>

patient visits tended to be double the median number of visits suggesting that a subpopulation of patients pursuing chiropractic care and/or spinal manipulation are frequent or long term users of these services. The majority of studies focused on low back pain (LBP) relative to other back regions, predominately in persons with chronic pain. The available information suggests that roughly equal proportions of LBP patients use chiropractic as complementary to conventional care and as alternative to conventional care. Current literature provides little insight into the manner in which chiropractic care/spinal manipulation is combined with other therapies for LBP.

Despite the common use of chiropractic care/spinal manipulation by patients with back pain the current literature provides limited data on utilization. This relative dearth of information challenges the design of meaningful pragmatic trials by researchers, confuses expectations of clinicians considering referral to such services, and impedes the ability of policymakers and healthcare payers to establish if provision of chiropractic care/spinal manipulation is in keeping with clinical guidelines. High quality prospective observational studies on chiropractic care/spinal manipulation are needed to establish utilization data by location of complaint, the specific type of spinal manipulative therapy applied, if chiropractic care is used as complementary or alternative to conventional care, and how spinal manipulative therapy is combined with other therapies in the management of axial pain.

This systematic review also shows that persons with back pain frequently use massage and acupuncture for treating their back pain in both the U.S. and in other eligible countries. The rates of use were widely varying and were related to a number of factors, including: the type of sample recruited (i.e., large national sample or smaller practice based sample), the timeframe for recall, the anatomical region, and the method used to measure utilization. Few studies evaluated rates of use as a function of the anatomical location of the back pain. The attributes of the CAM provider and the specifics of the therapy administered, such as treatment location, duration and frequency, were poorly detailed. Given the variety of modalities within acupuncture and massage, it would be important to establish differences in patterns of use, if any, for the differing location and duration of back pain. Future research should also adequately link the specific provider types to the specific subcategories of CAM therapies and contrast these with patterns of use in differing back pain populations.

There were a few studies evaluating the use of naturopathic medicine and other related therapies in the management of back or neck pain. These suggest that naturopathic medicine and related therapies are utilized in a limited manner by persons with back pain. However, the use of dietary supplements is generally not well captured in utilization studies, since they may be self-administered, and the lack of studies in this review on this type of CAM may reflect a limitation in our search strategy. More research is required to gain an accurate estimate of the use of dietary supplements for back pain.

There were some challenges when evaluating methodological quality of the utilization studies given the differing designs and outcomes. The outcomes establishing patterns of use specific to persons with back pain were collected from patient or practitioner recall surveys/interview, health record review, or analysis of administrative health claim databases. Similarly, the majority of studies on utilization employed observational designs without a true control or concurrent group. Approximately one-quarter of the U.S. studies and half of the non-U.S. studies were cross-sectional in design. Many of these studies recruited random, population-based samples with acceptable response rates; standardized and pre-tested methods for data collection were likely used in these studies. One-third of studies were based on medical records or administrative database utilization data. The majority of the U.S. studies used standardized

coding for classifying back pain (predominately ICD 9 codes), provider visits, and enrollee characteristics and treatments; given the pre-specified coding systems, linkages between elements within the database were likely limited in errors. The majority of non-U.S. studies were based on health record extraction for which the use of standardized forms was not specified.

Approximately half the U.S. studies were single group prospective design and one-quarter used retrospective database information. These study designs and methods of data collection, lend themselves to consistent biases, in particular, selection and recall bias. Many of the samples for these studies were recruited from practitioner settings and may reflect provider practice patterns rather than health system utilization. However, they do provide some information that may benefit research undertaken using large samples and comparative designs. From a quality perspective, observational study designs that lack comparator groups are problematic to assess, as there is currently no consensus on the criteria to judge validity. Future research in this area may benefit from potential consensus on the most important validity criteria for these designs, which will ultimately assist in comparison across different studies. The rest of the publications were cross-sectional in design along and a few were randomized trials; relatively fewer of these studies were undertaken within the U.S. than in other eligible countries. These comparative design studies were generally well conducted using large population samples.

However, irrespective of the design type, the majority of studies reviewed were based on patient or practitioner self-report that has inherent limitations that may not be addressed by the study design. For example, there is the trade-off between increased accuracy by asking patients to report “lifetime use” rather than more detailed utilization information which is highly prone to inaccuracy. Similarly, interpreting the differing operational definitions of the CAM therapies and providers, and the definition of back pain across studies, even when using comparative designs, is problematic. Overall, we judged the literature on utilization of CAM and back pain as fair in methodological quality; studies as a whole are susceptible to some biases, and do not meet all criteria for excellent validity. However, the flaws are not sufficient to completely negate all the results.

## **Recommendations for Use of CAM**

Our evaluation of U.S. clinical practice guidelines (CPG) showed extremely limited information on the recommended use of CAM services for persons with back pain. Only one CPG, for electro-acupuncture use, provided recommendations for the frequency of treatment that was stratified by pain duration, and recurrence. All other eligible CPG recommended the use of a particular therapy based on efficacy or effectiveness, but did not provide guidelines for frequency and duration of treatment intervals. A significant gap with regards to recommended utilization for persons with back pain of differing durations and anatomical regions has been identified. In part, the lack of utilization recommendations may reflect limitations in high quality evidence from randomized trials focusing on the optimal dosage for treatment benefit. This precludes some consensus amongst clinicians and methodologists with regards to the specifics of “dosage” as a function of therapy. Descriptions of both the frequency and the duration of each treatment session would provide the minimum level of dosage for utilization for a course of treatment. However, there are other factors to consider such as the intensity of treatment or the speed of application.<sup>159</sup> Although, these finer aspects of dosage will likely vary with the CAM therapy, they may ultimately impact use and efficacy.



Reluctance on the part of provider organizations to prescribe recommended frequency and duration of treatment in the absence of credible efficacy evidence may be another consideration. A number of other factors that may also influence recommended use include: provider organization policies, moderating factors such as access to, or availability of the CAM service, attitudes or philosophies of the practitioner (reactivation treatment versus biomedical activity restriction approaches), and the practice setting, particularly national health service versus private practice.<sup>52</sup> A mixed method approach including qualitative components<sup>50</sup> may hold some promise for future investigation of provider attitudes and concerns about establishing and adhering to utilization guidelines.

## **Costs Associated With CAM Therapies and Back Pain**

We also evaluated studies that measured cost-related outcomes associated with CAM use for back pain patients in the United States. The majority of studies reporting cost outcomes were cost identification analyses and not true economic analyses; a single study undertook a formal cost effectiveness analysis (CEA). The studies with cost outcomes were primarily from a payer perspective and as such evaluated direct costs; indirect costs were not captured or reported. A variety of cost estimates were reported spanning from 1982 to 2003 U.S. dollars. Although most studies showed that costs vary with the provider type, the interpretation of these differences is problematic in the absence of links to benefits or harms. Also problematic is the often implicit assumption that the effects of the providers and their treatments are equivalent. The majority of studies evaluated chiropractors as the exclusive CAM provider and medical doctors (M.D.s) as the conventional practitioners; comparison of costs between these two providers is dominant in the studies evaluated. In general, these studies suggest that treatments by chiropractors and physical therapist were characterized by more visits relative to M.D.s; visits to M.D.'s, although less frequent were more costly, particularly for specialists.

## **Challenges of Evaluating Utilization**

### **Variation in Measuring and Reporting Utilization**

Our systematic review found that studies used definitions ranging from a maximum of lifetime use, to a minimum of one visit to a CAM practitioner to determine use. The proportion of patients with back pain within a practice of a CAM provider was also a commonly reported outcome for utilization. Although this would provide some insight into practice patterns for specific providers, it limits interpretation at the population or system level. Overall, there was limited information with regards to the frequency of visits for specified intervals, the duration of each visit, the details of the CAM therapies administered, and the provider attributes.

A variety of methods and outcomes has been used to measure utilization of health services in the CAM studies evaluated in this review. Primarily these include self-report in surveys, administration databases using health claims, and physician record. A review of literature on the accuracy of self-report of health care utilization,<sup>80</sup> identified six key factors affecting the accuracy of self-report and the potential for response bias: 1) recall time-frame, with under reporting increasing with longer time intervals, 2) type of utilization data requested (for example emergency room, or clinic visit), 3) utilization frequency, 4) questionnaire design, 5) mode of data collection, and 6) the use of memory aids or probes. Additional factors that affect accuracy

of self-reported healthcare utilization include stress, motivation, and interview dynamics. In this particular review,<sup>80</sup> and indeed in many of the studies included in our review, utilization was defined as a visit to a clinical provider or clinical entity. This definition may present some limitations when reporting utilization of supplements or home remedies. Additionally, there is some indication that characteristics of the respondents may impact recall and response bias. For example, elderly respondents were found to over report contact with general practitioners, physiotherapists, and chiropractors and under report contact with other medical specialists; in addition, the elderly respondents were more accurate at reporting no use of a practitioner or service than use.<sup>86</sup> Whether or not persons with back pain have an increased propensity to err in accuracy of self-reported utilization is not known.

The type of utilization that is being reported may also impact accuracy. Some errors in self-reported utilization of services may be related to aspects of reporting on contact utilization or volume utilization. Respondents reporting ever having seen a practitioner or used a service (contact utilization) may be more accurate than reporting details of the frequency and duration of visits (volume utilization).<sup>86</sup> Studies evaluating self-report of utilization consistently show an association between increased visit frequency and under reporting.<sup>80</sup>

Errors when using data from administrative databases for health claims can include problems created by reliance on the database administrator to input claims data accurately and in a timely manner. Typically there may be problems with linking patient demographic information and patient use information, as well as incomplete data on some enrolled members. For studies in the U.S., it is likely that patients who are not covered or who have insufficient medical coverage will be less likely to seek services; as such there is the potential for selection biases despite large claimant samples.<sup>85</sup> In addition, differences in codes to define back pain, episodes of care, the provider types, and method of cost estimates may present some limitations in comparison across studies. It is not clear to what degree these factors can be standardized for future research, but reporting of these key characteristics would be helpful.

## **Distinguishing the CAM Practitioner From the CAM Intervention**

Our systematic review consistently found that the use of the CAM therapy and the provider of the therapy were poorly detailed. Many of the eligible studies on CAM use were based on populations derived from CAM provider practices; as such one could assume that 100 percent of the sample used CAM but no clarity as to which of many potential therapies the patient received. There is also the problem of describing CAM therapies using broad categories that in reality encompass a variety of different therapies. For example, Traditional Chinese Medicine employs a variety of treatments some of which, such as use of herbals and needling, are considered CAM while others such as exercise therapy or the use of heat and cold are not.

The lack of specificity of the provider type is also problematic. Consider again Traditional Chinese Medicine, where based on most of the literature we would likely assume that the provider was an acupuncturist, but this is not necessarily the case. There is also the possibility that the same provider types located in different countries, display markedly different patterns of use. For example, osteopathic practices within the U.S. have broader philosophies of care relative to their counterparts within the United Kingdom who focus more on traditional spinal adjustments. The degree to which the provider type contributes to differences in patterns of use is generally not known in the literature specific to CAM use for back pain. As well, the degree to

which regional, rather than national differences, are factors contributing to varying rates of use, could not be assessed within the current literature.

Provider attributes such as professional designation, years of experience, and area of specialty, were also detailed poorly, limiting evaluation of the level of influence these factors have on frequency and duration of CAM use. The lack of detail about the provider is further confounded when some CAM therapies can be administered by non-professionals or are self-administered. If the goal of utilization research is to evaluate provider-based use, then care should be taken in the phrasing of survey or interview questions querying CAM therapies that can be self-administered. Clearly, to understand the patterns of use the provider details are critical.

The lack of specificity about both the CAM therapy and the provider, present challenges in interpreting utilization patterns across studies. Future research should provide greater clarity about the type of provider and the CAM therapy. More importantly, future research endeavors should link the detailed CAM therapies utilization data to specific provider types.

## **Distinguishing Complementary Versus Alternative**

Lack of specificity regarding both the provider and the details of the CAM therapy administered are also important limitations with regards to evaluating the degree to which CAM services overlap with each other or with services or care from conventional providers. The degree of overlap was not reported in the majority of studies. This lack of specificity was also evident in descriptions of therapies provided by “conventional” providers which can include CAM therapies. Future research in this area should endeavor to document these aspects of overlap in order to better understand patterns of use.

As more “conventional practitioners” choose to use CAM therapies within their “conventional” practices, the distinction between alternative and traditional is becoming blurred. When evaluating studies, it was not clear what “CAM use only” or “conventional care only” implied with respect to alternative versus complementary treatments. There is also the problem of shifting classification of what is labeled CAM. As noted previously, the operational definition of “alternative” implies that the therapy is used in place of conventional medicine.<sup>73</sup> Our review would suggest that chiropractic treatment is used frequently and in many instances is “conventional care” in the U.S. Similarly in studies undertaken in the United Kingdom, acupuncture provided by a physiotherapist was labeled as conventional therapy; acupuncture provided by a “conventional” provider is the primary modality used to manage chronic back pain in the U.K.<sup>110</sup> Classification is further complicated by the designation of some treatments as “integrative” medicine, implying that care combines alternative and conventional care. It is likely that patterns of use of a particular therapy, irrespective of the label of alternative or conventional will be affected by the provider and their care philosophy. Future studies should endeavor to specify operational definitions for alternative and conventional therapies and providers. This will assist not only in understanding patterns of use within a study, but also interpretation of variations across utilization studies.

## **Potential Limitations of the Systematic Review Process**

The eligible studies within this systematic review were limited to primary studies in the English language; although this may not be an important factor for U.S. studies, it may be a

source of bias for studies in the other eligible countries. Our focus was on summarizing literature from the U.S. Evaluating literature on CAM use in Canada, the United Kingdom, Europe, New Zealand, and Australia was a secondary focus.

We undertook a comprehensive search and used over 150 CAM related search terms; however we recognize that we used a relatively small number of terms specific to supplements and herbals. There are over 10,000 types of these products and searching for each specifically was not within the scope of this review.

Although we recognize that there is inconsistency in these terms, we did not exclude studies based on their definition of back pain, and its duration (i.e., chronic or acute). When operational definitions for neck or back pain were provided, considerable variability was observed across studies. The majority of studies in this review focused on querying subjects with regard to their back complaint(s) and use of CAM; most studies did not distinguish the potential for CAM therapies received to include management of other secondary health complaints which are a potential source of contamination. We did not restrict the source of the back pain allowing for both musculoskeletal and non-musculoskeletal causes. Nor did we restrict studies because of the potential for associated co-morbidities such as depression in chronic LBP patients.

Many of the studies depended on self-report of CAM and back pain, and as such, are dependent on the respondents' knowledge of both the CAM therapy and their understanding of back pain either of which may differ from that of the researchers. Additionally, we accepted any definition of the CAM therapies specified within each study and this would naturally introduce variability in our summaries of the use of these therapies. Some studies defined CAM as "any treatment or remedy, other than standard over the counter medications, which you are using or have used" and others provided great level of detail with regard to different CAM therapies. We did restrict some types of therapies that we were considered predominately conventional such the use of medications and spinal injections. No attempt was made to distinguish those CAM therapies that are safe or effective, but rather the focus was on reporting all use of CAM therapies.

Finally, we did not restrict studies by the manner in which the utilization was collected or reported. Variability in reporting and means of collecting utilization of CAM therapies was substantial. We evaluated both contact and volume utilization outcomes.

## **Conclusions**

Although we evaluated 74 studies on utilization and costs in persons with back pain using CAM therapies, there were significant limitations in understanding the patterns of use across studies. In part the variation and inconsistencies across studies may be attributable to lack of consensus on reporting in utilization and other health services studies. Consensus on reporting standards such as the CONSORT Statement for randomized control trial studies provide guidance as to the level of detail required in specifying the characteristics of the population, the intervention, and the outcomes. Activities in this regard will assist future evaluation of utilization studies in general.

Our systematic review demonstrates that CAM therapies are frequently used by persons with back pain. Understanding the patterns of CAM therapy utilization would assist in setting research priorities for evaluation of specific CAM therapies or providers. Our findings would support the following conclusions and recommendations for future research in this area:

## **Population**

- 1) Many studies provided minimal information about the characteristics of the sample. In particular, most reports on utilization of CAM therapies do not specify an operational definition for back pain with respect to the anatomical location, or the duration of pain. We recommend that future studies adequately detail the study subjects under investigation and explicitly detail the location of the back pain and whether it is acute or chronic.
- 2) Low back was the most frequently evaluated anatomical region. Fewer studies evaluated the use of CAM for neck and thorax. Although, we recognize that the prevalence of back problems is lower in these regions, our review did not find sufficient evidence to support the differential use of CAM therapies as a function of location. We recommend that future utilization studies of CAM use for back pain address any potential differential use of therapies as a function of anatomical location. We also recommend capture of use of CAM therapies for multiple back regions being treated within or across episodes of care, since some CAM therapies treat regions distant from the low back as part of their theoretical model of back pain care.

## **Intervention**

- 3) CAM therapies were frequently identified as broad categories, with little specification of the type of modality used. Similarly, the providers of the therapies were very poorly detailed or were not linked to the therapies received. We recommend that future studies adequately detail the specific type of CAM therapy, and link this to the providers of the therapy.
- 4) There were few studies that evaluated the use of CAM therapies relative to each other for back pain. The available studies would suggest that chiropractic/manipulation is the most frequently used modality followed by massage and acupuncture. We recommend that future studies evaluating relative use of CAM include a comprehensive list of CAM therapies and provide details in this regard. We recommend that this use be linked to all providers of the therapy. We also recommend that use with other CAM therapies is differentiated with respect to current and past episodes of back pain.

## **Comparator**

- 5) Concurrent use of different CAM or conventional therapies was not well reported. A significant gap in the literature has been identified. We recommend that future studies detail the level of concurrent use of other CAM or conventional therapies with respect to current or past episodes of care, location of back pain, and the provider of the therapy.
- 6) Our review would suggest that there was inconsistency with regards to the types of therapies and providers considered conventional or alternative. We recommend that future studies explicitly detail the nature of the therapies linked to specific providers rather than relying on labels of conventional or alternative therapies or providers.

## **Outcomes**

- 7) Utilization of CAM services is generally presented as a dichotomous outcome (use or non-use); less information is available with regards to frequency, duration and type of service provision for an episode of care. We would recommend that future research probe frequency and duration of use (preferably in more than one time interval), associated with both the CAM therapy and the provider of the therapy. We also recommend that the “episode of care” being evaluated be explicitly defined.

- 8) The primary source of information on utilization of CAM therapies for back pain comes from self-report within questionnaires and from retrospective administrative healthcare analyses. We recommend that explicit details of the survey or interview questions are provided including the operational definitions of the CAM therapies and the categories of providers. Similarly, we recommend that explicit definitions for the type of back pain, the provider types, and the therapy received are provided for studies using administrative databases.
- 9) The studies reporting cost outcomes are primarily cost identification in nature rather than true economic analyses. The perspective was primarily that of the payer and as such, only direct costs were evaluated. We recommend that future evaluation of costs include details about indirect costs, consider the costs from a societal perspective, and use formal economic analyses that consider the benefits and harms associated with intensity of use.

#### **Other**

- 10) A single CPG reported on frequency of use as a function of low back pain duration. The majority of U.S. CPG guidelines on CAM therapies did not report utilization or recommend parameters for optimal use. A significant gap in the literature has been identified. We recommend that future guideline development attempt to address this gap for CAM therapies as a function of back region and duration; guideline developers should indicate when these recommendations are based on evidence and when they reflect best practice.
- 11) Few studies were found that reported provider views on recommendations for the optimal utilization of CAM therapies for back pain. Providers' philosophies of care and healthcare setting constraints may affect patterns of use. We recommend that future studies explore issues in provider and possibly patient views about the frequency and duration of utilization. We recommend that these views be explored in the context of specific subgroups of back patients based on location and duration, different providers of the same CAM therapy, and conventional providers' views of their own interventions and those of CAM providers.



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## Appendix A – Search Strategies Detailed

### Ovid MEDLINE(R) <1950 to October Week 4 2007> (Nov05\_07)

1. Acupressure.tw.
2. Acupuncture.tw.
3. Alexander Technique.tw.
4. Anthroposophy.tw.
5. (Apitherapy or bee venom).tw.
6. Applied Biomechanics.tw.
7. Applied Kinesiology.tw.
8. Aromatherapy.tw.
9. (art therap\$ not "state of the art").tw.
10. ((autogenic adj3 (therap\$ or treatment?)) or passive concentration).tw.
11. (aversion adj2 (therap\$ or treatment?)).tw.
12. Ayurved\$.tw.
13. bach flower.tw.
14. (Balneotherapy or therapeutic bath\$.tw.
15. Biofeedback.tw.
16. Body Electronics.tw.
17. (Bowen adj2 (Therap\$ or technique?)).tw.
18. (Breathwork or (breath\$ adj (exercis\$ or technique?))).tw.
19. Holotropic?.tw.
20. Cell Therapy.tw.
21. (Cheirology or palmistry).tw.
22. chelation.tw.
23. Chiropract\$.tw.
24. molecular therap\$.tw.
25. ((lumines\$ or luminou\$) adj2 (treatment? or therap\$ or technique?)).tw.
26. Cognitive Therapy.tw.
27. ((colon or colonic) adj2 (hydrotherapy or irrigation)).tw.
28. Contact Reflex Analysis.tw.
29. Craniosacral Therapy.tw.
30. ((crystal? or gemstone?) adj2 (treatment? or therap\$)).tw.
31. ((cupping and mugwort) or moxibustion).tw.
32. (Detoxification adj2 (Therap\$ or treatment? or technique?)).tw.
33. did?eridoo.tw.
34. (Dream adj2 (Therap\$ or analysis)).tw.
35. ((ear adj2 (candling or coning)) or thermal-auricular therapy).tw.
36. (Transcutaneous Electrical Nerve Stimulation or tens or electrotherapy).tw.
37. (Emotional freedom technique? or (tapping and cupping) or thought field therap\$).tw.
38. (energy adj2 (medicine or field? or therap\$)).tw.
39. (Enzyme adj3 Therap\$).tw.
40. (essence? adj2 (therap\$ or flower? or treatment?)).tw.

41. (Eye Movement Desensitization or emdr).tw.
42. ((fasting or cleansing) adj2 (therap\$ or treatment?)).tw.
43. (Feldenkrais or (body awareness adj2 (therap\$ or treatment?))).tw.
44. (Gerson Therapy or coffee enema?).tw.
45. Gestalt Therap\$.tw.
46. Guided Imagery.tw.
47. (healing touch or bodywork).tw.
48. Hellerwork.tw.
49. (herbal or herb?).tw.
50. homeopath\$.tw.
51. ((humor or laughter) adj3 (treatment? or therap\$)).tw.
52. Huna.tw.
53. (Hydrogen Peroxide adj2 (Therap\$ or treatment?)).tw.
54. (Hydrotherapy or hydrotherapy).tw.
55. (hyperbaric adj3 (treatment? or therap\$ or oxygen\$)).tw.
56. (hyperthermia adj (treatment? or therap\$)).tw.
57. (hypnotherapy or hypnosis).tw.
58. (iridology or iridodiagnosis).tw.
59. Jaffe-Mellor.tw.
60. Jin Shin Jyutsu.tw.
61. Juice Therapy.tw.
62. Kegel Exercise?.tw.
63. ((Light or helio or photo) adj2 (Therap\$ or treatment?)).tw.
64. Macrobiotic?.tw.
65. (((magnet\$ adj2 (therap\$ or treatment?)) not "mri") or magnetotherap\$).tw.
66. Manual Lymphatic Drainage.tw.
67. marma.tw.
68. (shiatsu or rolfing or massage).tw.
69. medical intuiti\$.tw.
70. Meditation.tw.
71. mind body.tw.
72. (Music adj (Therap\$ or treatment?)).tw.
73. Nambudripad.tw.
74. (NAET or allergy elimination).tw.
75. Naprapath\$.tw.
76. (nasal adj (irrigation or lavage)).tw.
77. Naturopath\$.tw.
78. ((Neuro-Linguistic or neuro?linguistic) adj1 Programming).tw.
79. ((neuromuscular or trigger point) adj2 (therap\$ or myotherapy)).tw.
80. ((nutri\$ or diet\$) adj (therap\$ or treatment?)).tw.
81. (Orthomolecular or optimum nutrition).tw.
82. ((ozone or oxygen) adj2 (therap\$ or treatment?)).tw.
83. Panchakarma.tw.
84. past life.tw.
85. ((pet or animal) adj2 (therap\$ or treatment?)).tw.
86. Pilates.tw.



87. (polarity adj2 (medicine or therap\$ or treatment?)).tw.
88. pranic.tw.
89. Prayer.tw.
90. Prolotherapy.tw.
91. (QiGong or chi kung).tw.
92. radiance technique?.tw.
93. Rapid Eye Technology.tw.
94. Reflexology.tw.
95. Reiki.tw.
96. (relaxation adj2 (therap\$ or treatment? or technique?)).tw.
97. (Somatic Ontology or Structural Integration).tw.
98. Rosen Method.tw.
99. Rubenfeld Synergy.tw.
100. shaman\$.tw.
101. (spiritual\$ adj3 (healing or therap\$ or treatment? or practice?)).tw.
102. Stress Management.tw.
103. Tai Chi.tw.
104. (tao or taoist or taoism or daoism or daoist).tw.
105. (touch adj2 (therapeutic or treatment? or healing or therap\$)).tw.
106. ((chinese or oriental) adj2 (medicine or treatment? or healing)).tw.
107. transsage.tw.
108. (Trager adj2 (Method or approach or technique? or work)).tw.
109. (trepan\$ or burr hole).tw.
110. (Tuina or tui na).tw.
111. Urani Medicine.tw.
112. (Urine Therapy or urotherapy or urinotherapy).tw.
113. (visuali?ation adj (therap\$ or treatment?)).tw.
114. Visceral Manipulation.tw.
115. ((vitamin or megavitamin) adj2 (therap\$ or treatment?)).tw.
116. Watsu.tw.
117. Wave Work.tw.
118. (yoga or yogic).tw.
119. johrei.tw.
120. qui gong.tw.
121. speleotherapy.tw.
122. halotherapy.tw.
123. (hopi adj3 candle?).tw.
124. biofield.tw.
125. (holistic adj3 (medicine or healing or treatment? or therap\$)).tw.
126. Bioelectromagnetic.tw.
127. kampo.tw.
128. muti.tw.
129. (microcurrent adj2 (therap\$ or treatment?)).tw.
130. ((traditional or tibetan or Indian or Chinese or Arabic or African or mongolian) adj2 (medicine or healing)).tw.
131. (Chromatotherapy or colo?r therapy).tw.

132. (kirlian photography or gas discharge visuali#ation).tw.
133. ((complementary or alternative or unconventional or integrative) adj2 (medicine or healing)).tw.
134. ((complementary or unconventional or integrative) adj2 (treatment? or therap\$)).tw.
135. or/1-134
136. exp complementary therapies/
137. Formularies, Homeopathic/
138. Pharmacopoeias, Homeopathic/
139. plants, medicinal/
140. Medicine, Herbal/
141. Chiropractic/
142. Acupuncture/
143. Osteopathic Medicine/
144. Electroacupuncture/
145. exp Plant Extracts/
146. exp balneology/
147. exp nutrition therapy/
148. exp phototherapy/
149. exp exercise movement techniques/
150. exp Hyperthermia, Induced/
151. exp venoms/
152. exp Musculoskeletal Manipulations/
153. exp psychotherapy/
154. hydrotherapy/
155. exp oxygen inhalation therapy/
156. exp physical therapy modalities/
157. Ethnopharmacology/
158. Ethnobotany/
159. exp Pharmacognosy/
160. exp oils/
161. Materia Medica/
162. exp self care/
163. spirituality/
164. or/136-163
165. 135 or 164
166. exp Neck/
167. exp spine/
168. exp back/
169. Neck Muscles/
170. or/166-169
171. pain/ or pain, intractable/ or pain, referred/
172. (pain\$ or ache?).tw.
173. or/171-172
174. 170 and 173
175. exp back pain/
176. exp back injuries/ or exp neck injuries/ or exp spinal cord injuries/ or exp spinal injuries/

177. Neck Pain/  
 178. exp spinal diseases/  
 179. Sciatica/  
 180. coccy\$.tw.  
 181. dorsalgia.tw.  
 182. sciatica.tw.  
 183. spondyl\$.tw.  
 184. lumbago.tw.  
 185. facet joint?.tw.  
 186. arachnoiditis.tw.  
 187. failed back.tw.  
 188. (stenosis adj3 spin\$.tw).  
 189. discitis.tw.  
 190. (dis? adj3 (degener\$ or prolapse or hernia\$ or bulge or protrusion or extrusion or sequestration or disorder? or disease? or rupture?)).tw.  
 191. backache?.tw.  
 192. ((back or neck or spine or spinal or lumb\$) adj3 (ache? or pain?)).tw.  
 193. or/174-192  
 194. limit 193 to complementary medicine  
 195. 165 and 193  
 196. or/194-195  
 197. ut.fs.  
 198. td.fs.  
 199. sn.fs.  
 200. ("use" or "used" or usage or utili?ation).tw.  
 201. consumption.ti.  
 202. exp Data Collection/  
 203. exp Consumer Satisfaction/  
 204. exp delivery of health care/  
 205. "quality of health care"/ or "process assessment (health care)"/ or "utilization review"/  
 206. tu.fs.  
 207. or/197-206  
 208. 196 and 207  
 209. limit 208 to yr="1990 - 2007"  
 210. animals/ not (animals/ and humans/)  
 211. 209 not 210  
 212. limit 211 to english language  
 213. (note or comment or editorial or letter).pt.  
 214. 212 not 213

## **AMED (Allied and Complementary Medicine) <1985 to November 2007> Search Strategy (Nov5\_07)**

1. Acupressure.tw.
2. Acupuncture.tw.
3. Alexander Technique.tw.
4. Anthroposophy.tw.
5. (Apitherapy or bee venom).tw.
6. Applied Biomechanics.tw.
7. Applied Kinesiology.tw.
8. Aromatherapy.tw.
9. (art therap\$ not "state of the art").tw.
10. ((autogenic adj3 (therap\$ or treatment?)) or passive concentration).tw.
11. (aversion adj2 (therap\$ or treatment?)).tw.
12. Ayurved\$.tw.
13. bach flower.tw.
14. (Balneotherapy or therapeutic bath\$.tw.
15. Biofeedback.tw.
16. Body Electronics.tw.
17. (Bowen adj2 (Therap\$ or technique?)).tw.
18. (Breathwork or (breath\$ adj (exercis\$ or technique?))).tw.
19. Holotropic?.tw.
20. Cell Therapy.tw.
21. (Cheirology or palmistry).tw.
22. chelation.tw.
23. Chiropract\$.tw.
24. molecular therap\$.tw.
25. ((lumines\$ or luminou\$) adj2 (treatment? or therap\$ or technique?)).tw.
26. Cognitive Therapy.tw.
27. ((colon or colonic) adj2 (hydrotherapy or irrigation)).tw.
28. Contact Reflex Analysis.tw.
29. Craniosacral Therapy.tw.
30. ((crystal? or gemstone?) adj2 (treatment? or therap\$)).tw.
31. ((cupping and mugwort) or moxibustion).tw.
32. (Detoxification adj2 (Therap\$ or treatment? or technique?)).tw.
33. did?eridoo.tw.
34. (Dream adj2 (Therap\$ or analysis)).tw.
35. ((ear adj2 (candling or coning)) or thermal-auricular therapy).tw.
36. (Transcutaneous Electrical Nerve Stimulation or tens or electrotherapy).tw.
37. (Emotional freedom technique? or (tapping and cupping) or thought field therap\$).tw.
38. (energy adj2 (medicine or field? or therap\$)).tw.
39. (Enzyme adj3 Therap\$).tw.
40. (essence? adj2 (therap\$ or flower? or treatment?)).tw.
41. (Eye Movement Desensiti?ation or emdr).tw.
42. ((fasting or cleansing) adj2 (therap\$ or treatment?)).tw.
43. (Feldenkrais or (body awareness adj2 (therap\$ or treatment?))).tw.

44. (Gerson Therapy or coffee enema?).tw.
45. Gestalt Therap\$.tw.
46. Guided Imagery.tw.
47. (healing touch or bodywork).tw.
48. Hellerwork.tw.
49. (herbal or herb?).tw.
50. homeopath\$.tw.
51. ((humo?r or laughter) adj3 (treatment? or therap\$)).tw.
52. Huna.tw.
53. (Hydrogen Peroxide adj2 (Therap\$ or treatment?)).tw.
54. (Hydrotherapy or hydrotherapy).tw.
55. (hyperbaric adj3 (treatment? or therap\$ or oxygen\$)).tw.
56. (hyperthermia adj (treatment? or therap\$)).tw.
57. (hypnotherapy or hypnosis).tw.
58. (iridology or iridodiagnosis).tw.
59. Jaffe-Mellor.tw.
60. Jin Shin Jyutsu.tw.
61. Juice Therapy.tw.
62. Kegel Exercise?.tw.
63. ((Light or helio or photo) adj2 (Therap\$ or treatment?)).tw.
64. Macrobiotic?.tw.
65. (((magnet\$ adj2 (therap\$ or treatment?)) not "mri") or magnetotherap\$).tw.
66. Manual Lymphatic Drainage.tw.
67. marma.tw.
68. (shiatsu or rolfing or massage).tw.
69. medical intuiti\$.tw.
70. Meditation.tw.
71. mind body.tw.
72. (Music adj (Therap\$ or treatment?)).tw.
73. Nambudripad.tw.
74. (NAET or allergy elimination).tw.
75. Naprapath\$.tw.
76. (nasal adj (irrigation or lavage)).tw.
77. Naturopath\$.tw.
78. ((Neuro-Linguistic or neuro?linguistic) adj1 Programming).tw.
79. ((neuromuscular or trigger point) adj2 (therap\$ or myotherapy)).tw.
80. ((nutri\$ or diet\$) adj (therap\$ or treatment?)).tw.
81. (Orthomolecular or optimum nutrition).tw.
82. ((ozone or oxygen) adj2 (therap\$ or treatment?)).tw.
83. Panchakarma.tw.
84. past life.tw.
85. ((pet or animal) adj2 (therap\$ or treatment?)).tw.
86. Pilates.tw.
87. (polarity adj2 (medicine or therap\$ or treatment?)).tw.
88. pranic.tw.
89. Prayer.tw.

90. Prolotherapy.tw.
91. (QiGong or chi kung).tw.
92. radiance technique?.tw.
93. Rapid Eye Technology.tw.
94. Reflexology.tw.
95. Reiki.tw.
96. (relaxation adj2 (therap\$ or treatment? or technique?)).tw.
97. (Somatic Ontology or Structural Integration).tw.
98. Rosen Method.tw.
99. Rubenfeld Synergy.tw.
100. shaman\$.tw.
101. (spiritual\$ adj3 (healing or therap\$ or treatment? or practice?)).tw.
102. Stress Management.tw.
103. Tai Chi.tw.
104. (tao or taoist or taoism or daoism or daoist).tw.
105. (touch adj2 (therapeutic or treatment? or healing or therap\$)).tw.
106. ((chinese or oriental) adj2 (medicine or treatment? or healing)).tw.
107. transsage.tw.
108. (Trager adj2 (Method or approach or technique? or work)).tw.
109. (trepan\$ or burr hole).tw.
110. (Tuina or tui na).tw.
111. Urani Medicine.tw.
112. (Urine Therapy or urotherapy or urinotherapy).tw.
113. (visuali?ation adj (therap\$ or treatment?)).tw.
114. Visceral Manipulation.tw.
115. ((vitamin or megavitamin) adj2 (therap\$ or treatment?)).tw.
116. Watsu.tw.
117. Wave Work.tw.
118. (yoga or yogic).tw.
119. johrei.tw.
120. qui gong.tw.
121. speleotherapy.tw.
122. halotherapy.tw.
123. (hopi adj3 candle?).tw.
124. biofield.tw.
125. (holistic adj3 (medicine or healing or treatment? or therap\$)).tw.
126. Bioelectromagnetic.tw.
127. kampo.tw.
128. muti.tw.
129. (microcurrent adj2 (therap\$ or treatment?)).tw.
130. ((traditional or tibetan or Indian or Chinese or Arabic or African or mongolian) adj2 (medicine or healing)).tw.
131. (Chromatotherapy or colo?r therapy).tw.
132. (kirlian photography or gas discharge visuali#ation).tw.
133. ((complementary or alternative or unconventional or integrative) adj2 (medicine or healing)).tw.

134. ((complementary or unconventional or integrative) adj2 (treatment? or therap\$)).tw.
135. or/1-134
136. exp complementary medicine/
137. acupuncture/ or chiropractic/
138. exp homeopathic drugs/
139. exp plant extracts/
140. exp plants medicinal/
141. Osteopathy/
142. physical medicine/
143. hyperthermia induced/
144. exp Oxygen inhalation therapy/
145. exp psychotherapy/
146. spirituality/
147. exp physical therapy modalities/
148. or/136-147
149. 135 or 148
150. exp neck/
151. exp spine/
152. exp back/
153. Neck Muscles/
154. or/150-153
155. pain/ or pain, intractable/
156. (pain\$ or ache?).tw.
157. or/155-156
158. 154 and 157
159. exp backache/
160. back injuries/ or exp neck injuries/ or exp spinal cord injuries/ or spinal injuries/
161. Neck Pain/
162. exp spinal disease/
163. Sciatica/
164. coccy\$.tw.
165. dorsalgia.tw.
166. sciatica.tw.
167. spondyl\$.tw.
168. lumbago.tw.
169. (dis? adj3 (degener\$ or prolapse or hernia\$ or bulge or protrusion or extrusion or sequestration or disorder? or disease? or rupture?)).tw.
170. facet joint?.tw.
171. arachnoiditis.tw.
172. failed back.tw.
173. (stenosis adj3 spin\$).tw.
174. discitis.tw.
175. ((back or neck or spine or spinal or lumb\$) adj3 (ache? or pain?)).tw.
176. backache?.tw.
177. or/158-176
178. 149 and 177

- 179. limit 178 to yr="1990 - 2007"
- 180. limit 179 to english language
- 181. (editorial or letter or comment).pt.
- 182. 180 not 181

## **EBM Reviews - Cochrane Central Register of Controlled Trials <4th Quarter 2007> Search Strategy (Nov05\_07)**

- 1. Acupressure.tw.
- 2. Acupuncture.tw.
- 3. Alexander Technique.tw.
- 4. Anthroposophy.tw.
- 5. (Apitherapy or bee venom).tw.
- 6. Applied Biomechanics.tw.
- 7. Applied Kinesiology.tw.
- 8. Aromatherapy.tw.
- 9. (art therap\$ not "state of the art").tw.
- 10. ((autogenic adj3 (therap\$ or treatment?)) or passive concentration).tw.
- 11. (aversion adj2 (therap\$ or treatment?)).tw.
- 12. Ayurved\$.tw.
- 13. bach flower.tw.
- 14. (Balneotherapy or therapeutic bath\$.tw.
- 15. Biofeedback.tw.
- 16. Body Electronics.tw.
- 17. (Bowen adj2 (Therap\$ or technique?)).tw.
- 18. (Breathwork or (breath\$ adj (exercis\$ or technique?))).tw.
- 19. Holotropic?.tw.
- 20. Cell Therapy.tw.
- 21. (Cheirology or palmistry).tw.
- 22. chelation.tw.
- 23. Chiropract\$.tw.
- 24. molecular therap\$.tw.
- 25. ((lumines\$ or luminou\$) adj2 (treatment? or therap\$ or technique?)).tw.
- 26. Cognitive Therapy.tw.
- 27. ((colon or colonic) adj2 (hydrotherapy or irrigation)).tw.
- 28. Contact Reflex Analysis.tw.
- 29. Craniosacral Therapy.tw.
- 30. ((crystal? or gemstone?) adj2 (treatment? or therap\$)).tw.
- 31. ((cupping and mugwort) or moxibustion).tw.
- 32. (Detoxification adj2 (Therap\$ or treatment? or technique?)).tw.
- 33. did?eridoo.tw.
- 34. (Dream adj2 (Therap\$ or analysis)).tw.
- 35. ((ear adj2 (candling or coning)) or thermal-auricular therapy).tw.
- 36. (Transcutaneous Electrical Nerve Stimulation or tens or electrotherapy).tw.
- 37. (Emotional freedom technique? or (tapping and cupping) or thought field therap\$).tw.
- 38. (energy adj2 (medicine or field? or therap\$)).tw.



39. (Enzyme adj3 Therap\$).tw.
40. (essence? adj2 (therap\$ or flower? or treatment?)).tw.
41. (Eye Movement Desensiti?ation or emdr).tw.
42. ((fasting or cleansing) adj2 (therap\$ or treatment?)).tw.
43. (Feldenkrais or (body awareness adj2 (therap\$ or treatment?))).tw.
44. (Gerson Therapy or coffee enema?).tw.
45. Gestalt Therap\$.tw.
46. Guided Imagery.tw.
47. (healing touch or bodywork).tw.
48. Hellerwork.tw.
49. (herbal or herb?).tw.
50. homeopath\$.tw.
51. ((humo?r or laughter) adj3 (treatment? or therap\$)).tw.
52. Huna.tw.
53. (Hydrogen Peroxide adj2 (Therap\$ or treatment?)).tw.
54. (Hydrotherapy or hydrotherapy).tw.
55. (hyperbaric adj3 (treatment? or therap\$ or oxygen\$)).tw.
56. (hyperthermia adj (treatment? or therap\$)).tw.
57. (hypnotherapy or hypnosis).tw.
58. (iridology or iridodiagnosis).tw.
59. Jaffe-Mellor.tw.
60. Jin Shin Jyutsu.tw.
61. Juice Therapy.tw.
62. Kegel Exercise?.tw.
63. ((Light or helio or photo) adj2 (Therap\$ or treatment?)).tw.
64. Macrobiotic?.tw.
65. (((magnet\$ adj2 (therap\$ or treatment?)) not "mri") or magnetotherap\$).tw.
66. Manual Lymphatic Drainage.tw.
67. marma.tw.
68. (shiatsu or rolfing or massage).tw.
69. medical intuiti\$.tw.
70. Meditation.tw.
71. mind body.tw.
72. (Music adj (Therap\$ or treatment?)).tw.
73. Nambudripad.tw.
74. (NAET or allergy elimination).tw.
75. Naprapath\$.tw.
76. (nasal adj (irrigation or lavage)).tw.
77. Naturopath\$.tw.
78. ((Neuro-Linguistic or neuro?linguistic) adj1 Programming).tw.
79. ((neuromuscular or trigger point) adj2 (therap\$ or myotherapy)).tw.
80. ((nutri\$ or diet\$) adj (therap\$ or treatment?)).tw.
81. (Orthomolecular or optimum nutrition).tw.
82. ((ozone or oxygen) adj2 (therap\$ or treatment?)).tw.
83. Panchakarma.tw.
84. past life.tw.

85. ((pet or animal) adj2 (therap\$ or treatment?)).tw.
86. Pilates.tw.
87. (polarity adj2 (medicine or therap\$ or treatment?)).tw.
88. pranic.tw.
89. Prayer.tw.
90. Prolotherapy.tw.
91. (QiGong or chi kung).tw.
92. radiance technique?.tw.
93. Rapid Eye Technology.tw.
94. Reflexology.tw.
95. Reiki.tw.
96. (relaxation adj2 (therap\$ or treatment? or technique?)).tw.
97. (Somatic Ontology or Structural Integration).tw.
98. Rosen Method.tw.
99. Rubenfeld Synergy.tw.
100. shaman\$.tw.
101. (spiritual\$ adj3 (healing or therap\$ or treatment? or practice?)).tw.
102. Stress Management.tw.
103. Tai Chi.tw.
104. (tao or taoist or taoism or daoism or daoist).tw.
105. (touch adj2 (therapeutic or treatment? or healing or therap\$)).tw.
106. ((chinese or oriental) adj2 (medicine or treatment? or healing)).tw.
107. transsage.tw.
108. (Trager adj2 (Method or approach or technique? or work)).tw.
109. (trepan\$ or burr hole).tw.
110. (Tuina or tui na).tw.
111. Urani Medicine.tw.
112. (Urine Therapy or urotherapy or urinotherapy).tw.
113. (visuali?ation adj (therap\$ or treatment?)).tw.
114. Visceral Manipulation.tw.
115. ((vitamin or megavitamin) adj2 (therap\$ or treatment?)).tw.
116. Watsu.tw.
117. Wave Work.tw.
118. (yoga or yogic).tw.
119. johrei.tw.
120. qui gong.tw.
121. speleotherapy.tw.
122. halotherapy.tw.
123. (hopi adj3 candle?).tw.
124. biofield.tw.
125. (holistic adj3 (medicine or healing or treatment? or therap\$)).tw.
126. Bioelectromagnetic.tw.
127. kampo.tw.
128. muti.tw.
129. (microcurrent adj2 (therap\$ or treatment?)).tw.

130. ((traditional or tibetan or Indian or Chinese or Arabic or African or mongolian) adj2 (medicine or healing)).tw.
131. (Chromatotherapy or color therapy).tw.
132. (kirlian photography or gas discharge visualization).tw.
133. ((complementary or alternative or unconventional or integrative) adj2 (medicine or healing)).tw.
134. ((complementary or unconventional or integrative) adj2 (treatment? or therapy)).tw.
135. or/1-134
136. exp complementary therapies/
137. Formularies, Homeopathic/
138. Pharmacopoeias, Homeopathic/
139. plants, medicinal/
140. Medicine, Herbal/
141. Chiropractic/
142. Acupuncture/
143. Osteopathic Medicine/
144. Electroacupuncture/
145. exp Plant Extracts/
146. exp balneology/
147. exp nutrition therapy/
148. exp phototherapy/
149. exp exercise movement techniques/
150. exp Hyperthermia, Induced/
151. exp venoms/
152. exp Musculoskeletal Manipulations/
153. exp psychotherapy/
154. hydrotherapy/
155. exp oxygen inhalation therapy/
156. exp physical therapy modalities/
157. Ethnopharmacology/
158. Ethnobotany/
159. exp Pharmacognosy/
160. exp oils/
161. Materia Medica/
162. exp self care/
163. spirituality/
164. or/136-163
165. 135 or 164
166. exp Neck/
167. exp spine/
168. exp back/
169. Neck Muscles/
170. or/166-169
171. pain/ or pain, intractable/ or pain, referred/
172. (pain\$ or ache?).tw.
173. or/171-172

174. 170 and 173
175. exp back pain/
176. exp back injuries/ or exp neck injuries/ or exp spinal cord injuries/ or exp spinal injuries/
177. Neck Pain/
178. exp spinal diseases/
179. Sciatica/
180. coccy\$.tw.
181. dorsalgia.tw.
182. sciatica.tw.
183. spondyl\$.tw.
184. lumbago.tw.
185. facet joint?.tw.
186. arachnoiditis.tw.
187. failed back.tw.
188. (stenosis adj3 spin\$.tw.
189. discitis.tw.
190. (dis? adj3 (degener\$ or prolapse or hernia\$ or bulge or protrusion or extrusion or sequestration or disorder? or disease? or rupture?)).tw.
191. backache?.tw.
192. ((back or neck or spine or spinal or lumb\$) adj3 (ache? or pain?)).tw.
193. or/174-192
194. 165 and 193
195. limit 194 to yr="1990 - 2007"

## **CINAHL - Cumulative Index to Nursing & Allied Health Literature <1982 to October Week 4 2007> Search Strategy (Nov5\_07)**

1. Acupressure.tw.
2. Acupuncture.tw.
3. Alexander Technique.tw.
4. Anthroposophy.tw.
5. (Apitherapy or bee venom).tw.
6. Applied Biomechanics.tw.
7. Applied Kinesiology.tw.
8. Aromatherapy.tw.
9. (art therap\$ not "state of the art").tw.
10. ((autogenic adj3 (therap\$ or treatment?)) or passive concentration).tw.
11. (aversion adj2 (therap\$ or treatment?)).tw.
12. Ayurved\$.tw.
13. bach flower.tw.
14. (Balneotherapy or therapeutic bath\$.tw.
15. Biofeedback.tw.
16. Body Electronics.tw.
17. (Bowen adj2 (Therap\$ or technique?)).tw.
18. (Breathwork or (breath\$ adj (exercis\$ or technique?))).tw.
19. Holotropic?.tw.

20. Cell Therapy.tw.
21. (Cheirology or palmistry).tw.
22. chelation.tw.
23. Chiropract\$.tw.
24. molecular therap\$.tw.
25. ((lumines\$ or luminou\$) adj2 (treatment? or therap\$ or technique?)).tw.
26. Cognitive Therapy.tw.
27. ((colon or colonic) adj2 (hydrotherapy or irrigation)).tw.
28. Contact Reflex Analysis.tw.
29. Craniosacral Therapy.tw.
30. ((crystal? or gemstone?) adj2 (treatment? or therap\$)).tw.
31. ((cupping and mugwort) or moxibustion).tw.
32. (Detoxification adj2 (Therap\$ or treatment? or technique?)).tw.
33. did?eridoo.tw.
34. (Dream adj2 (Therap\$ or analysis)).tw.
35. ((ear adj2 (candling or coning)) or thermal-auricular therapy).tw.
36. (Transcutaneous Electrical Nerve Stimulation or tens or electrotherapy).tw.
37. (Emotional freedom technique? or (tapping and cupping) or thought field therap\$).tw.
38. (energy adj2 (medicine or field? or therap\$)).tw.
39. (Enzyme adj3 Therap\$).tw.
40. (essence? adj2 (therap\$ or flower? or treatment?)).tw.
41. (Eye Movement Desensiti?ation or emdr).tw.
42. ((fasting or cleansing) adj2 (therap\$ or treatment?)).tw.
43. (Feldenkrais or (body awareness adj2 (therap\$ or treatment?))).tw.
44. (Gerson Therapy or coffee enema?).tw.
45. Gestalt Therap\$.tw.
46. Guided Imagery.tw.
47. (healing touch or bodywork).tw.
48. Hellerwork.tw.
49. (herbal or herb?).tw.
50. homeopath\$.tw.
51. ((humo?r or laughter) adj3 (treatment? or therap\$)).tw.
52. Huna.tw.
53. (Hydrogen Peroxide adj2 (Therap\$ or treatment?)).tw.
54. (Hydrotherapy or hydropathy).tw.
55. (hyperbaric adj3 (treatment? or therap\$ or oxygen\$)).tw.
56. (hyperthermia adj (treatment? or therap\$)).tw.
57. (hypnotherapy or hypnosis).tw.
58. (iridology or iridodiagnosis).tw.
59. Jaffe-Mellor.tw.
60. Jin Shin Jyutsu.tw.
61. Juice Therapy.tw.
62. Kegel Exercise?.tw.
63. ((Light or helio or photo) adj2 (Therap\$ or treatment?)).tw.
64. Macrobiotic?.tw.
65. (((magnet\$ adj2 (therap\$ or treatment?)) not "mri") or magnetotherap\$).tw.

66. Manual Lymphatic Drainage.tw.
67. marma.tw.
68. (shiatsu or rolfing or massage).tw.
69. medical intuiti\$.tw.
70. Meditation.tw.
71. mind body.tw.
72. (Music adj (Therap\$ or treatment?)).tw.
73. Nambudripad.tw.
74. (NAET or allergy elimination).tw.
75. Naprapath\$.tw.
76. (nasal adj (irrigation or lavage)).tw.
77. Naturopath\$.tw.
78. ((Neuro-Linguistic or neuro?linguistic) adj1 Programming).tw.
79. ((neuromuscular or trigger point) adj2 (therap\$ or myotherapy)).tw.
80. ((nutri\$ or diet\$) adj (therap\$ or treatment?)).tw.
81. (Orthomolecular or optimum nutrition).tw.
82. ((ozone or oxygen) adj2 (therap\$ or treatment?)).tw.
83. Panchakarma.tw.
84. past life.tw.
85. ((pet or animal) adj2 (therap\$ or treatment?)).tw.
86. Pilates.tw.
87. (polarity adj2 (medicine or therap\$ or treatment?)).tw.
88. pranic.tw.
89. Prayer.tw.
90. Prolotherapy.tw.
91. (QiGong or chi kung).tw.
92. radiance technique?.tw.
93. Rapid Eye Technology.tw.
94. Reflexology.tw.
95. Reiki.tw.
96. (relaxation adj2 (therap\$ or treatment? or technique?)).tw.
97. (Somatic Ontology or Structural Integration).tw.
98. Rosen Method.tw.
99. Rubenfeld Synergy.tw.
100. shaman\$.tw.
101. (spiritual\$ adj3 (healing or therap\$ or treatment? or practice?)).tw.
102. Stress Management.tw.
103. Tai Chi.tw.
104. (tao or taoist or taoism or daoism or daoist).tw.
105. (touch adj2 (therapeutic or treatment? or healing or therap\$)).tw.
106. ((chinese or oriental) adj2 (medicine or treatment? or healing)).tw.
107. transsage.tw.
108. (Trager adj2 (Method or approach or technique? or work)).tw.
109. (trepan\$ or burr hole).tw.
110. (Tuina or tui na).tw.
111. Urani Medicine.tw.

112. (Urine Therapy or urotherapy or urinotherapy).tw.
113. (visuali?ation adj (therap\$ or treatment?)).tw.
114. Visceral Manipulation.tw.
115. ((vitamin or megavitamin) adj2 (therap\$ or treatment?)).tw.
116. Watsu.tw.
117. Wave Work.tw.
118. (yoga or yogic).tw.
119. johrei.tw.
120. qui gong.tw.
121. speleotherapy.tw.
122. halotherapy.tw.
123. (hopi adj3 candle?).tw.
124. biofield.tw.
125. (holistic adj3 (medicine or healing or treatment? or therap\$)).tw.
126. Bioelectromagnetic.tw.
127. kampo.tw.
128. muti.tw.
129. (microcurrent adj2 (therap\$ or treatment?)).tw.
130. ((traditional or tibetan or Indian or Chinese or Arabic or African or mongolian) adj2 (medicine or healing)).tw.
131. (Chromatotherapy or colo?r therapy).tw.
132. (kirlian photography or gas discharge visuali#ation).tw.
133. ((complementary or alternative or unconventional or integrative) adj2 (medicine or healing)).tw.
134. ((complementary or unconventional or integrative) adj2 (treatment? or therap\$)).tw.
135. or/1-134
136. exp Alternative Therapies/
137. research, alternative therapies/ or research, chiropractic/
138. Homeopathic Agents/
139. exp Plants, Medicinal/
140. exp Alternative Health Personnel/
141. exp Plant Extracts/
142. Chiropractic Practice/
143. Osteopathy/
144. balneology/ or exp hydrotherapy/ or exp hyperthermia, induced/ or exp massage/ or exp phototherapy/ or hyperoxygenation/ or exp oxygen therapy/
145. exp Venoms/
146. exp Psychotherapy/
147. Energy Field/
148. iridology/
149. photochemotherapy/ or exp photodynamic therapy/ or exp diet therapy/
150. exp Alternative Health Personnel/
151. self care/ or self medication/
152. exp Oils/
153. nutritional support/ or exp dietary supplementation/
154. Spirituality/

155. or/136-154
156. 135 or 155
157. exp Neck/
158. exp spine/
159. exp back/
160. neck muscles/
161. or/157-160
162. pain/ or chronic pain/ or muscle pain/ or referred pain/
163. (pain\$ or ache?).tw.
164. or/162-163
165. 161 and 164
166. exp Back Pain/
167. exp back injuries/ or exp neck injuries/ or exp spinal cord injuries/ or exp spinal injuries/
168. neck pain/
169. sciatica/
170. exp Spinal Diseases/
171. coccy\$.tw.
172. dorsalgia.tw.
173. sciatica.tw.
174. spondyl\$.tw.
175. lumbago.tw.
176. (dis? adj3 (degener\$ or prolapse or hernia\$ or bulge or protrusion or extrusion or sequestration or disorder? or disease? or rupture?)).tw.
177. facet joint?.tw.
178. arachnoiditis.tw.
179. failed back.tw.
180. (stenosis adj3 spin\$.tw.
181. discitis.tw.
182. ((back or neck or spine or spinal or lumb\$) adj3 (ache? or pain?)).tw.
183. or/165-182
184. 156 and 183
185. ut.fs.
186. td.fs.
187. tu.fs.
188. ("use" or "used" or usage or utili?ation).tw.
189. consumption.ti.
190. exp Data Collection/
191. exp Consumer Satisfaction/
192. "quality of health care"/ or "process assessment (health care)"/ or "utilization review"/
193. exp health care delivery/
194. Trend Studies/
195. or/185-194
196. 184 and 195
197. limit 196 to yr="1990 - 2007"
198. limit 197 to english
199. (letter or editorial).pt.



## EMBASE <1980 to 2007 Week 44> Search Strategy (Nov5\_07)

1. Acupressure.tw.
2. Acupuncture.tw.
3. Alexander Technique.tw.
4. Anthroposophy.tw.
5. (Apitherapy or bee venom).tw.
6. Applied Biomechanics.tw.
7. Applied Kinesiology.tw.
8. Aromatherapy.tw.
9. (art therap\$ not "state of the art").tw.
10. ((autogenic adj3 (therap\$ or treatment?)) or passive concentration).tw.
11. (aversion adj2 (therap\$ or treatment?)).tw.
12. Ayurved\$.tw.
13. bach flower.tw.
14. (Balneotherapy or therapeutic bath\$.tw.
15. Biofeedback.tw.
16. Body Electronics.tw.
17. (Bowen adj2 (Therap\$ or technique?)).tw.
18. (Breathwork or (breath\$ adj (exercis\$ or technique?))).tw.
19. Holotropic?.tw.
20. Cell Therapy.tw.
21. (Cheirology or palmistry).tw.
22. chelation.tw.
23. Chiropract\$.tw.
24. molecular therap\$.tw.
25. ((lumines\$ or luminou\$) adj2 (treatment? or therap\$ or technique?)).tw.
26. Cognitive Therapy.tw.
27. ((colon or colonic) adj2 (hydrotherapy or irrigation)).tw.
28. Contact Reflex Analysis.tw.
29. Craniosacral Therapy.tw.
30. ((crystal? or gemstone?) adj2 (treatment? or therap\$)).tw.
31. ((cupping and mugwort) or moxibustion).tw.
32. (Detoxification adj2 (Therap\$ or treatment? or technique?)).tw.
33. did?eridoo.tw.
34. (Dream adj2 (Therap\$ or analysis)).tw.
35. ((ear adj2 (candling or coning)) or thermal-auricular therapy).tw.
36. (Transcutaneous Electrical Nerve Stimulation or tens or electrotherapy).tw.
37. (Emotional freedom technique? or (tapping and cupping) or thought field therap\$).tw.
38. (energy adj2 (medicine or field? or therap\$)).tw.
39. (Enzyme adj3 Therap\$).tw.
40. (essence? adj2 (therap\$ or flower? or treatment?)).tw.
41. (Eye Movement Desensiti?ation or emdr).tw.
42. ((fasting or cleansing) adj2 (therap\$ or treatment?)).tw.

43. (Feldenkrais or (body awareness adj2 (therap\$ or treatment?))).tw.
44. (Gerson Therapy or coffee enema?).tw.
45. Gestalt Therap\$.tw.
46. Guided Imagery.tw.
47. (healing touch or bodywork).tw.
48. Hellerwork.tw.
49. (herbal or herb?).tw.
50. homeopath\$.tw.
51. ((humo?r or laughter) adj3 (treatment? or therap\$)).tw.
52. Huna.tw.
53. (Hydrogen Peroxide adj2 (Therap\$ or treatment?)).tw.
54. (Hydrotherapy or hydropathy).tw.
55. (hyperbaric adj3 (treatment? or therap\$ or oxygen\$)).tw.
56. (hyperthermia adj (treatment? or therap\$)).tw.
57. (hypnotherapy or hypnosis).tw.
58. (iridology or iridodiagnosis).tw.
59. Jaffe-Mellor.tw.
60. Jin Shin Jyutsu.tw.
61. Juice Therapy.tw.
62. Kegel Exercise?.tw.
63. ((Light or helio or photo) adj2 (Therap\$ or treatment?)).tw.
64. Macrobiotic?.tw.
65. (((magnet\$ adj2 (therap\$ or treatment?)) not "mri") or magnetotherap\$).tw.
66. Manual Lymphatic Drainage.tw.
67. marma.tw.
68. (shiatsu or rolfing or massage).tw.
69. medical intuiti\$.tw.
70. Meditation.tw.
71. mind body.tw.
72. (Music adj (Therap\$ or treatment?)).tw.
73. Nambudripad.tw.
74. (NAET or allergy elimination).tw.
75. Naprapath\$.tw.
76. (nasal adj (irrigation or lavage)).tw.
77. Naturopath\$.tw.
78. ((Neuro-Linguistic or neuro?linguistic) adj1 Programming).tw.
79. ((neuromuscular or trigger point) adj2 (therap\$ or myotherapy)).tw.
80. ((nutri\$ or diet\$) adj (therap\$ or treatment?)).tw.
81. (Orthomolecular or optimum nutrition).tw.
82. ((ozone or oxygen) adj2 (therap\$ or treatment?)).tw.
83. Panchakarma.tw.
84. past life.tw.
85. ((pet or animal) adj2 (therap\$ or treatment?)).tw.
86. Pilates.tw.
87. (polarity adj2 (medicine or therap\$ or treatment?)).tw.
88. pranic.tw.

89. Prayer.tw.
90. Prolotherapy.tw.
91. (QiGong or chi kung).tw.
92. radiance technique?.tw.
93. Rapid Eye Technology.tw.
94. Reflexology.tw.
95. Reiki.tw.
96. (relaxation adj2 (therap\$ or treatment? or technique?)).tw.
97. (Somatic Ontology or Structural Integration).tw.
98. Rosen Method.tw.
99. Rubenfeld Synergy.tw.
100. shaman\$.tw.
101. (spiritual\$ adj3 (healing or therap\$ or treatment? or practice?)).tw.
102. Stress Management.tw.
103. Tai Chi.tw.
104. (tao or taoist or taoism or daoism or daoist).tw.
105. (touch adj2 (therapeutic or treatment? or healing or therap\$)).tw.
106. ((chinese or oriental) adj2 (medicine or treatment? or healing)).tw.
107. transsage.tw.
108. (Trager adj2 (Method or approach or technique? or work)).tw.
109. (trepan\$ or burr hole).tw.
110. (Tuina or tui na).tw.
111. Urani Medicine.tw.
112. (Urine Therapy or urotherapy or urinotherapy).tw.
113. (visuali?ation adj (therap\$ or treatment?)).tw.
114. Visceral Manipulation.tw.
115. ((vitamin or megavitamin) adj2 (therap\$ or treatment?)).tw.
116. Watsu.tw.
117. Wave Work.tw.
118. (yoga or yogic).tw.
119. johrei.tw.
120. qui gong.tw.
121. speleotherapy.tw.
122. halotherapy.tw.
123. (hopi adj3 candle?).tw.
124. biofield.tw.
125. (holistic adj3 (medicine or healing or treatment? or therap\$)).tw.
126. Bioelectromagnetic.tw.
127. kampo.tw.
128. muti.tw.
129. (microcurrent adj2 (therap\$ or treatment?)).tw.
130. ((traditional or tibetan or Indian or Chinese or Arabic or African or mongolian) adj2 (medicine or healing)).tw.
131. (Chromatotherapy or colo?r therapy).tw.
132. (kirlian photography or gas discharge visuali#ation).tw.

133. ((complementary or alternative or unconventional or integrative) adj2 (medicine or healing)).tw.
134. ((complementary or unconventional or integrative) adj2 (treatment? or therap\$)).tw.
135. or/1-134
136. exp psychiatric treatment/
137. exp alternative medicine/
138. exp traditional medicine/
139. exp Acupuncture/
140. homeopathy/
141. ayurvedic drug/ or homeopathic agent/
142. meditation/
143. transcendental meditation/
144. exp physical medicine/
145. exp Medicinal Plant/
146. exp Plant Extract/
147. exp plant medicinal product/ or ayurvedic drug/ or homeopathic agent/
148. exp Venom/
149. exp diet therapy/
150. exp edible oil/
151. chelation therapy/
152. phytotherapy/
153. exp self care/
154. religion/
155. or/136-154
156. 135 or 155
157. exp Back/
158. exp neck/
159. or/157-158
160. pain/ or chronic pain/ or intractable pain/
161. (pain\$ or ache?).tw.
162. or/160-161
163. 159 and 162
164. exp Backache/
165. Neck Pain/
166. exp spine injury/
167. exp neck injury/
168. exp Spine Disease/
169. Ischialgia/
170. coccy\$.tw.
171. dorsalgia.tw.
172. sciatica.tw.
173. spondyl\$.tw.
174. lumbago.tw.
175. facet joint?.tw.
176. arachnoiditis.tw.
177. failed back.tw.

178. (stenosis adj3 spin\$).tw.
179. discitis.tw.
180. (dis? adj3 (degener\$ or prolapse or hernia\$ or bulge or protrusion or extrusion or sequestration or disorder? or disease? or rupture?)).tw.
181. backache?.tw.
182. ((back or neck or spine or spinal or lumb\$) adj3 (ache? or pain?)).tw.
183. or/163-182
184. 156 and 183
185. ("use" or "used" or usage or utili?ation).tw.
186. consumption.ti.
187. exp Consumer Satisfaction/
188. exp delivery of health care/
189. "quality of health care"/ or "process assessment (health care)"/ or "utilization review"/
190. health survey/
191. patient participation/ or patient satisfaction/
192. health care delivery/
193. trend study/
194. health care utilization/
195. or/185-194
196. 184 and 195
197. limit 196 to yr="1990 - 2007"
198. human.sh.
199. nonhuman.sh.
200. animal.sh.
201. animal experiment.sh.
202. 199 or 200 or 201
203. 198 and 202
204. or/202-203
205. 197 not 204
206. limit 205 to english language
207. editorial/ or letter/ or note/
208. (editorial or letter or note).pt.
209. or/207-208
210. 206 not 209

## **PsycINFO <1985 to November Week 1 2007> Search Strategy (Nov15\_07)**

1. exp alternative medicine/
2. exp biofeedback/
3. dietary supplements/
4. holistic health/
5. exp hypnotherapy/
6. massage/
7. exp "medicinal herbs and plants"/
8. exp religious practices/

9. spirituality/
10. osteopathic medicine/
11. phototherapy/
12. exp relaxation therapy/
13. or/1-12
14. Acupressure.tw.
15. Acupuncture.tw.
16. Alexander Technique.tw.
17. Anthroposophy.tw.
18. (Apitherapy or bee venom).tw.
19. Applied Biomechanics.tw.
20. Applied Kinesiology.tw.
21. Aromatherapy.tw.
22. (art therap\$ not "state of the art").tw.
23. ((autogenic adj3 (therap\$ or treatment?)) or passive concentration).tw.
24. (aversion adj2 (therap\$ or treatment?)).tw.
25. Ayurved\$.tw.
26. bach flower.tw.
27. (Balneotherapy or therapeutic bath\$.tw.
28. Biofeedback.tw.
29. Body Electronics.tw.
30. (Bowen adj2 (Therap\$ or technique?)).tw.
31. (Breathwork or (breath\$ adj (exercis\$ or technique?))).tw.
32. Holotropic?.tw.
33. Cell Therapy.tw.
34. (Cheirology or palmistry).tw.
35. chelation.tw.
36. Chiropract\$.tw.
37. molecular therap\$.tw.
38. ((lumines\$ or luminou\$) adj2 (treatment? or therap\$ or technique?)).tw.
39. Cognitive Therapy.tw.
40. ((colon or colonic) adj2 (hydrotherapy or irrigation)).tw.
41. Contact Reflex Analysis.tw.
42. Craniosacral Therapy.tw.
43. ((crystal? or gemstone?) adj2 (treatment? or therap\$)).tw.
44. ((cupping and mugwort) or moxibustion).tw.
45. (Detoxification adj2 (Therap\$ or treatment? or technique?)).tw.
46. did?eridoo.tw.
47. (Dream adj2 (Therap\$ or analysis)).tw.
48. ((ear adj2 (candling or coning)) or thermal-auricular therapy).tw.
49. (Transcutaneous Electrical Nerve Stimulation or tens or electrotherapy).tw.
50. (Emotional freedom technique? or (tapping and cupping) or thought field therap\$.tw.
51. (energy adj2 (medicine or field? or therap\$)).tw.
52. (Enzyme adj3 Therap\$.tw.
53. (essence? adj2 (therap\$ or flower? or treatment?)).tw.
54. (Eye Movement Desensiti?ation or emdr).tw.

55. ((fasting or cleansing) adj2 (therap\$ or treatment?)).tw.
56. (Feldenkrais or (body awareness adj2 (therap\$ or treatment?))).tw.
57. (Gerson Therapy or coffee enema?).tw.
58. Gestalt Therap\$.tw.
59. Guided Imagery.tw.
60. (healing touch or bodywork).tw.
61. Hellerwork.tw.
62. (herbal or herb?).tw.
63. homeopath\$.tw.
64. ((humo?r or laughter) adj3 (treatment? or therap\$)).tw.
65. Huna.tw.
66. (Hydrogen Peroxide adj2 (Therap\$ or treatment?)).tw.
67. (Hydrotherapy or hydrotherapy).tw.
68. (hyperbaric adj3 (treatment? or therap\$ or oxygen\$)).tw.
69. (hyperthermia adj (treatment? or therap\$)).tw.
70. (hypnotherapy or hypnosis).tw.
71. (iridology or iridodiagnosis).tw.
72. Jaffe-Mellor.tw.
73. Jin Shin Jyutsu.tw.
74. Juice Therapy.tw.
75. Kegel Exercise?.tw.
76. ((Light or helio or photo) adj2 (Therap\$ or treatment?)).tw.
77. Macrobiotic?.tw.
78. (((magnet\$ adj2 (therap\$ or treatment?)) not "mri") or magnetotherap\$).tw.
79. Manual Lymphatic Drainage.tw.
80. marma.tw.
81. (shiatsu or rolfing or massage).tw.
82. medical intuiti\$.tw.
83. Meditation.tw.
84. mind body.tw.
85. (Music adj (Therap\$ or treatment?)).tw.
86. Nambudripad.tw.
87. (NAET or allergy elimination).tw.
88. Naprapath\$.tw.
89. (nasal adj (irrigation or lavage)).tw.
90. Naturopath\$.tw.
91. ((Neuro-Linguistic or neuro?linguistic) adj1 Programming).tw.
92. ((neuromuscular or trigger point) adj2 (therap\$ or myotherapy)).tw.
93. ((nutri\$ or diet\$) adj (therap\$ or treatment?)).tw.
94. (Orthomolecular or optimum nutrition).tw.
95. ((ozone or oxygen) adj2 (therap\$ or treatment?)).tw.
96. Panchakarma.tw.
97. past life.tw.
98. ((pet or animal) adj2 (therap\$ or treatment?)).tw.
99. Pilates.tw.
100. (polarity adj2 (medicine or therap\$ or treatment?)).tw.

101. pranic.tw.
102. Prayer.tw.
103. Prolotherapy.tw.
104. (QiGong or chi kung).tw.
105. radiance technique?.tw.
106. Rapid Eye Technology.tw.
107. Reflexology.tw.
108. Reiki.tw.
109. (relaxation adj2 (therap\$ or treatment? or technique?)).tw.
110. (Somatic Ontology or Structural Integration).tw.
111. Rosen Method.tw.
112. Rubenfeld Synergy.tw.
113. shaman\$.tw.
114. (spiritual\$ adj3 (healing or therap\$ or treatment? or practice?)).tw.
115. Stress Management.tw.
116. Tai Chi.tw.
117. (tao or taoist or taoism or daoism or daoist).tw.
118. (touch adj2 (therapeutic or treatment? or healing or therap\$)).tw.
119. ((chinese or oriental) adj2 (medicine or treatment? or healing)).tw.
120. transsage.tw.
121. (Trager adj2 (Method or approach or technique? or work)).tw.
122. (trepan\$ or burr hole).tw.
123. (Tuina or tui na).tw.
124. Urani Medicine.tw.
125. (Urine Therapy or urotherapy or urinotherapy).tw.
126. (visuali?ation adj (therap\$ or treatment?)).tw.
127. Visceral Manipulation.tw.
128. ((vitamin or megavitamin) adj2 (therap\$ or treatment?)).tw.
129. Watsu.tw.
130. Wave Work.tw.
131. (yoga or yogic).tw.
132. johrei.tw.
133. qui gong.tw.
134. speleotherapy.tw.
135. halotherapy.tw.
136. (hopi adj3 candle?).tw.
137. biofield.tw.
138. (holistic adj3 (medicine or healing or treatment? or therap\$)).tw.
139. Bioelectromagnetic.tw.
140. kampo.tw.
141. muti.tw.
142. (microcurrent adj2 (therap\$ or treatment?)).tw.
143. ((traditional or tibetan or Indian or Chinese or Arabic or African or mongolian) adj2 (medicine or healing)).tw.
144. (Chromatotherapy or colo?r therapy).tw.
145. (kirlian photography or gas discharge visuali#ation).tw.



146. ((complementary or alternative or unconventional or integrative) adj2 (medicine or healing)).tw.
147. ((complementary or unconventional or integrative) adj2 (treatment? or therap\$)).tw.
148. or/14-147
149. 148 or 13
150. spinal column/ or exp spinal cord/
151. "back (anatomy)"/
152. "neck (anatomy)"/
153. or/150-152
154. exp pain/
155. (pain\$ or ache?).tw.
156. pain management/
157. or/154-156
158. 153 and 157
159. exp back pain/
160. coccy\$.tw.
161. dorsalgia.tw.
162. sciatica.tw.
163. spondyl\$.tw.
164. lumbago.tw.
165. facet joint?.tw.
166. arachnoiditis.tw.
167. failed back.tw.
168. (stenosis adj3 spin\$).tw.
169. discitis.tw.
170. (dis? adj3 (degener\$ or prolapse or hernia\$ or bulge or protrusion or extrusion or sequestration or disorder? or disease? or rupture?)).tw.
171. backache?.tw.
172. ((back or neck or spine or spinal or lumb\$) adj3 (ache? or pain?)).tw.
173. exp spinal cord injuries/
174. or/158-173
175. 149 and 174
176. limit 175 to yr="1990 - 2007"
177. limit 176 to english language
178. limit 177 to human

## **Index to Chiropractic Literature (ICL) Searched February 4, 2008**

[S1](#) Subject:"BACK PAIN / THERAPY" OR Article Title:"back pain" OR Subject:"BACK PAIN / REHABILITATION", Year: from 1990 to 2008 586 2008-02-04 08:42:55

[S2](#) All Fields:utilization OR All Fields:rates OR Subject:"UTILIZATION REVIEW", Year: from 1990 to 2008, Publication Type:Article 66 2008-02-04 08:46:16

[S3](#) All Fields:utilization OR All Fields:rates OR Subject:"UTILIZATION REVIEW", Year: from 1990 to 2008, Publication Type:Clinical Trial 3 2008-02-04 08:48:27

[S4](#) All Fields:utilization OR All Fields:rates OR Subject:"UTILIZATION REVIEW", Year: from 1990 to 2008, Publication Type:Randomized Controlled Trial 3 2008-02-04 08:48:51

[S5](#) S2 OR S3 OR S4 72 2008-02-04 08:49:09

[S6](#) S1 AND S5 8 2008-02-04 08:49:17

[S7](#) All Fields:Usage, Year: from 1990 to 2008 27 2008-02-04 09:15:02

[S8](#) S2 OR S3 OR S4 OR S7 96 2008-02-04 09:15:23

[S9](#) S1 AND S8 10 2008-02-04 09:15:43

Separate Search:

Subject:"CHIROPRACTIC / UTILIZATION" OR Subject:"CHIROPRACTIC / UTILIZATION / CANADA" OR Subject:"CHIROPRACTIC / UTILIZATION / NEW YORK", Year: from 1990 to 2008

Separate Search:

Subject:"CHIROPRACTIC / STATISTICS & NUMERICAL DATA" OR Subject:"CHIROPRACTIC / TRENDS / CANADA" OR Subject:"CHIROPRACTIC / TRENDS", Year: from 1990 to 2008

### **ACUBRIEFS**

Search Terms: low back pain (subject heading) OR neck pain (keyword in Title)

### **Agricola**

Search Terms: Back pain

### **Micromedex**

Search Terms: back

### **Hom-Inform**

Search Terms: Spin\* OR Spondy\* OR Back\* OR complementary (in all fields); Use OR Usage (in title); Utilization (in all fields)

## **Other Search Sources**

### **New York Academy of Medicine Grey Literature Database**

Search Terms: CAM OR alternative medicine OR complementary medicine

### **Bandolier**

Search Terms: Complementary and alternative therapies (subject)

### **National Library of Health: Complementary and Alternative Medicine Specialist Library**

Search Terms(back pain)

### **Specific Web Sites Searched**

<http://www.ifebp.org/>

<http://www.ebri.org/>

<http://www.iscebs.org/>

<http://www.greatwestlife.com>

<https://www.kaiserpermanente.org/>

<http://www.kff.org/>

<http://www.iscmr.org/>

<http://theintegratorblog.com/site/>

<http://healthpromotionjournal.com>

<http://www.compmed.umm.edu/default.asp>

<http://www.fraserinstitute.org/>

<http://www.osher.ucsf.edu/>

<http://www.landmarkhealthcare.com/>

<http://www.ccachiro.org>

<http://www.aaaomonline.org/>

<http://www.academyhealth.org>

<http://www.landmarkhealthcare.com/>

<http://www.cms.hhs.gov>

<http://www.ncqa.org/>

<http://www.guideline.gov/>

### **Search Engine Searches**

Google

Dogpile

Complete Planet

Scirus

Search Terms:

Back pain cam

Back pain alternative medicine

Back pain complementary medicine

## Appendix B - Forms/Guides

### Title and Abstract Screening Level I

1. This paper should be
  - Excluded (not back pain, not CAM, not primary study or systematic review, not English, not US/Canada/Europe/Australia/NZ), not adults \_\_\_\_\_
  - Included/Not Sure

### Title and Abstract Screening Level II

1. Is this a Systematic Review? (ie lists the sources searched, years, follows SR procedures)
  - Not a review - primary study
  - Yes - focus on utilization or cost-effectiveness of CAM →exclude
  - Yes - focus on effectiveness of CAM →exclude
  - Review only - not systematic or not on topic →exclude
2. Does the study discuss the costs or use/utilization of CAM therapy? (if the study focuses on the effectiveness of the CAM therapy-answer No)
  - Yes
  - No (not CAM, not utilization) →exclude
  - Can't tell →continue
3. Where was the study conducted?
  - US data
  - Canada, Europe, Australia, NZ, UK
  - Other (Asia, India, Africa, SA) →exclude
  - Can't tell
4. Should it be excluded for other reasons? (eg. not adults, not English)
  - Yes, specify \_\_\_\_\_ →exclude

### Full-text Screening

1. Should be excluded for the following reasons
  - Systematic review →exclude
  - Practice guidelines →exclude
  - Not adults (18+) →exclude
  - No (continue)
2. Where was the study conducted?
  - US
  - Canada, Europe, UK, NZ, Australia
  - Other (Asia, India, Africa, SA) →exclude
  - Can't tell
3. Does the study discuss? (Check all that apply)

- Use/Utilization of CAM
- Costs associated with CAM therapy
- Views on using CAM therapy (practitioner or patients)
- None of the above →exclude

## **Data Extraction Form – Utilization Papers**

1. Category
  - Practitioner vs practitioner
  - Utilization survey
  - Specific CAM therapy
  - Specific diseased population
  - Specific CAM practitioner
  - Other
  - Cost utilization - US
  - Non-US costs only
  
2. Data extraction table prepared by:
  - Lina Santaguida
  - Mary Gauld
  - Rachel Morris
  - Solina Yoo
  - Other \_\_\_\_\_
  
3. Results of data extraction
  - Full data extraction - companions (if applicable) \_\_\_\_\_
  - Some data extraction - not presented for back pain with CAM
  - Companion article to: RefID \_\_\_\_\_
  
4. Additional data for consideration
  - Costs in USD
  - Costs in other currencies
  - Multivariate analysis
  - Questions or questionnaire available
  - Trends (time 1, time 2 etc.)
  - Recommendations from paper
  - None of the above

## **Data Extraction Form – Costs Papers**

1. Location of pain
  - Low back pain only
  - Neck pain only
  - Combination
  - Unspecified
  
2. Focus of paper
  - Comparison of care providers (specify)

- Insurance coverage
  - Costs per treatment
  - Non-medical costs discussed
3. Practitioner
- Chiropractor (DC)
  - MD
  - Physical Therapist
  - Naturopathic
  - Massage Therapist
  - Acupuncturist
  - Other (specify) \_\_\_\_\_
4. Type of Therapy
- Chiropractic
  - Manipulation
  - Massage
  - Acupuncture
  - Medical
  - Surgical
  - Other (specify) \_\_\_\_\_
5. Insurance
- No Insurance (out of pocket expense)
  - Private Insurance
  - Worker's Compensation
  - Medicaid, Medicare, HMO
  - Co-payments
  - Other \_\_\_\_\_
6. Costs provided
- Per episode
  - Per type of treatment
  - Non-medical costs (ie: transportation)
  - Direct costs for service provider (ie: clinical operating costs)
  - No specific costs provided

**Appendix Table 1. Characteristics of U.S. clinical practice guidelines specific to back pain evaluated for CAM therapies**

Author	Title	Scope	Intended Users	Target Population	Primary Outcomes	CAM therapies/ Recommendations
National Guideline Clearinghouse (NGC). Guideline Summary <sup>1</sup>  2004	Neck and upper back complaints	diagnosis evaluation management treatment	-advanced practice nurses -physician assistants -physicians utilization management	adults with potentially work-related neck and upper back complaints seen in primary care settings	missed work days	CAM therapies: -manipulation -heat or cold  Utilization recommendations: none
National Guideline Clearinghouse American College of Occupational and Environmental Medicine ACOEM <sup>2</sup>  2004, 2007	Low back complaints	diagnosis evaluation management treatment	-advanced practice nurses -physician assistants -physicians -physicians utilization management	adults with potentially work-related low back complaints seen in primary care settings	missed work days	CAM therapies: -manipulation -heat or cold -relaxation  Utilization recommendations: none
American College of Physicians (ACP) and the American Pain Society (APS) <sup>3</sup>  2007	Diagnosis and treatment of low back pain  A joint clinical practice guideline from ACP and APS	diagnosis management treatment	-physicians	adults with acute and chronic low back pain not associated with major trauma note: children or adolescents with low back pain; pregnant women; patients with low back pain from sources outside the back; fibromyalgia or other myofascial pain syndromes; and thoracic or cervical back pain are <u>not</u> included	-sensitivity and specificity of diagnostic tests -pain reduction -frequency of side effects from medication -cost	CAM therapies: -spinal manipulation -acupuncture -massage -yoga -progressive relaxation  Utilization recommendations: none

**Appendix Table 1. Characteristics of U.S. clinical practice guidelines specific to back pain evaluated for CAM therapies (continued)**

Author	Title	Scope	Intended Users	Target Population	Primary Outcomes	CAM therapies/ Recommendations
Council of Acupuncture and Oriental Medicine Associates (CAOMA), Foundation for Acupuncture Research <sup>4</sup>  2004	Acupuncture and electro-acupuncture evidence-based treatment guidelines	treatment	<ul style="list-style-type: none"> <li>-health care providers</li> <li>-health plans</li> <li>-managed care organizations</li> <li>-nurses</li> <li>-patients</li> <li>-physicians</li> <li>-utilization management</li> </ul>	patients with conditions affecting the neuromusculoskeletal system	<ul style="list-style-type: none"> <li>-frequency of flare-ups or episodes of pain</li> <li>-duration of flare-ups or episodes of pain</li> <li>-sensitivity of pain to triggers and aggravating factors</li> <li>-incidence of paresthesias and stiffness</li> <li>-range of motion</li> <li>-strength and endurance</li> <li>-amount of bruising, discoloration, scars, swelling, tenderness</li> <li>-medication and aids use</li> <li>-frequency of relapse</li> <li>-incidence of hospital visits or other medical interventions</li> </ul>	CAM Therapies: -electro-acupuncture  Utilization recommendations: recommendations are given for acute, sub-acute, chronic, and recurrent flare-up of conditions, including neck, torso and back problems  -effects of acupuncture are cumulative and as such, a single treatment not usually prescribed -final frequency and duration of treatments dependent on the condition being treated -recommend 12 - 18 treatments over a 4 to 6 week period



**Appendix Table 1. Characteristics of U.S. clinical practice guidelines specific to back pain evaluated for CAM therapies (continued)**

Author	Title	Scope	Intended Users	Target Population	Primary Outcomes	CAM therapies/ Recommendations
Institute for Clinical Systems Improvement (ICSI) <sup>5</sup>  2006	Adult low back pain	diagnosis evaluation management treatment	<ul style="list-style-type: none"> <li>-advanced practice nurses</li> <li>-allied health personnel</li> <li>-health care providers</li> <li>-health plans</li> <li>-hospitals</li> <li>-managed care organizations</li> <li>-nurses</li> <li>-physician assistants</li> <li>-physicians</li> </ul>	adult patients age 18 and over in primary care who have symptoms of low back pain or sciatica  Note: guideline focuses on acute and chronic management, including indications for medical non-surgical or surgical referral	<ul style="list-style-type: none"> <li>-number, duration, and intensity of pain episodes and recurrences</li> <li>-change in functional status (strength, mobility, endurance) associated with low back pain</li> <li>-time required to return to work</li> <li>-utilization of health care resources</li> <li>-diagnostic accuracy of various imaging techniques including lumbar spine computed tomography, magnetic resonance imaging, computed tomography myelography</li> <li>-patient satisfaction</li> </ul>	CAM Therapies: -ice -heat -manipulation -mobilization  Utilization recommendations: none

**Appendix Table 1. Characteristics of U.S. clinical practice guidelines specific to back pain evaluated for CAM therapies (continued)**

<b>Author</b>	<b>Title</b>	<b>Scope</b>	<b>Intended Users</b>	<b>Target Population</b>	<b>Primary Outcomes</b>	<b>CAM therapies/ Recommendations</b>
Work Loss Data Institute <sup>6</sup>  2007	Low back - lumbar & thoracic (acute & chronic)	diagnosis evaluation management treatment	-advanced practice nurses -health care providers -health plans -nurses -physician assistants -physicians	workers with low back pain	reliability and value of diagnostic assessments  effectiveness of treatment in relieving pain and restoring normal function	CAM Therapies: -massage -chiropractor -physical therapy  Utilization recommendations: none
Work Loss Data Institute <sup>7</sup>  2007	Neck and upper back (acute & chronic)	diagnosis evaluation management treatment	-advanced practice nurses -health care providers -health plans -nurses -physician assistants -physicians	workers with occupational disorders of the neck and upper back	-diagnostic value of tests -effectiveness of treatments for relieving pain and restoring normal function	not reported
Academy for Chiropractic Education <sup>8</sup>  2007	Manual medicine guidelines for musculoskeletal injuries	diagnosis evaluation management rehabilitation treatment	-chiropractors -health care providers -health plans -managed care organizations -patients -utilization management	individuals with musculoskeletal injuries	not reported	CAM therapies: -manual therapy -manipulation  Utilization recommendations: none

**Appendix Table 1. Characteristics of U.S. clinical practice guidelines specific to back pain evaluated for CAM therapies (continued)**

Author	Title	Scope	Intended Users	Target Population	Primary Outcomes	CAM therapies/ Recommendations
Research Commission of the Council on Chiropractic Guidelines and Practice Parameters <sup>9</sup>  2007	Chiropractic management of low back pain and low back related leg complaints		-chiropractors -chiropractic students and prospective students -chiropractic educators -educational institutions -chiropractic organizations -third-party payers -governmental agencies -patients and prospective patients		extent and quality of the evidence for or against the use of spinal manipulation/mobilization, physical activity and exercise for treatment of low back pain	CAM therapies: -manipulation  Utilization recommendations: none
Council on chiropractic practice <sup>10</sup>  2003	Vertebral subluxation in chiropractic practice	focused on specific modality in chiropractic	-chiropractors	chiropractors		CAM Therapies: -chiropractic  Utilization recommendations: none

**Appendix Table 1. Characteristics of U.S. clinical practice guidelines specific to back pain evaluated for CAM therapies (continued)**

Author	Title	Scope	Intended Users	Target Population	Primary Outcomes	CAM therapies/ Recommendations
California Health Benefits Review Program <sup>11</sup>  2004	Report to the 2007–2008 California State Legislature Analysis of Assembly Bill 54 Health Care Coverage: Acupuncture	an analysis of the medical, financial, and public health impacts of Assembly Bill 54, a bill to mandate coverage for group contract holders for expenses incurred as the result of treatment by licensed acupuncturists	-policy makers	policy makers	-medical effectiveness of acupuncture -cost -utilization -public health impacts	CAM Therapies: -acupuncture  Utilization recommendations: none

**Appendix Table 2. Agree scoring for CPG of Electro-acupuncture and utilization**

<b>AGREE Question</b>	<b>Final rating</b>	<b>Subscale Score</b>
1	4	
2	2	
3	3	9 / 12
4	1	
5	1	
6	4	6 / 12
7	1	
8	4	
9	4	
10	4	
11	4	
12	4	
13	3	
14	1	25 / 32
15	3	
16	2	
17	4	
18	1	9 / 16
19	4	
20	3	
21	1	8 / 12
22	1	
23	1	
24	Recommend with Provisos	

**Appendix Table 3. Study characteristics and results for U.S. studies evaluating costs for CAM services in persons with low back pain**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective Health Outcomes Adverse Events	Direct costs: Indirect costs:	Other Findings With: Insurance Coverage
Carey <sup>12</sup> 1995	SD: SGPS June 1992 to March 1993  CS: CID  BP: ALBP less than 10 weeks duration and no previous treatment  SS: Total: 1,633 310 (urban) 296 (rural) saw D.C.	Payer: Medicaid, Medicare, HMO, workers' compensation  Cost perspective: public and private insurance payer  Health Outcomes: baseline measures only  Adverse Events: not evaluated	Direct costs: (costs in 1995 USD) Outpatient costs per episode of LBP including: 1) visits, 2) X-rays & other imaging, 3) medications, 4) PT, 5) Other (D.C.) Data on the charges for outpatient services was based average state wide charges assigned by a large health insurance carrier  Mean Total Costs: Urban D.C.: \$808 (95% CI 717-900) Rural D.C.: \$554 (95% CI 461-648) Urban PCP: \$478 (95% CI 381-575) Rural PCP: \$540 (95% CI 455-625) OS: \$809 (95% CI 688-930)  Adjusted for baseline function Mean Costs: Urban D.C.: \$783 (95% CI 698-868) Rural D.C.: \$661 (95% CI 524-698) Urban PCP: \$508 (95% CI 418-598) Rural PCP: \$474 (95% CI 394-555) OS: \$746 (95% CI 633-858)  Indirect costs: not evaluated	highest costs were for patients seen by D.C. (high number of visits and imaging) and OS (high cost of visits and imaging and PT) with lowest costs seen by HMO  Insurance Coverage: Urban D.C.= 25% Rural D.C. = 23% Urban PCP = 10% Rural PCP= 13% OS = 38%

Abbreviations: ALBP=acute low back pain; AT=Acupuncturist; CEA=cost effectiveness analysis; CER1\*=incremental cost effectiveness ratio with adjusted mean difference in outcomes between D.C. and M.D. with office costs used in the numerator; CER2\*=incremental cost effectiveness ratio with adjusted mean difference in outcomes between D.C. and M.D. with total costs used in the numerator; CI=confidence interval; CID=Cost identification; CON=Conventional providers; D.C.=Doctor of chiropractic; HMO=health maintenance organization; M.D.=Medical doctor; MDF= MT=Massage Therapist; NRM=non-referred medical; OP=Out Patient OS=Orthopedic Surgeon; PCP=primary care provider; PM=Physical modalities; PT=Physical therapist; RM=Referred medical; Sd=standard deviation; SF=Short Form, SGPS=Single group prospective study; USD=United States Dollars; VAS=visual analog scale

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

<b>Author Year</b>	<b>Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)</b>	<b>Payer Cost Perspective Health Outcomes Adverse Events</b>	<b>Direct costs: Indirect costs:</b>	<b>Other Findings With: Insurance Coverage</b>
Sundararajan <sup>13</sup> 1998	SD, CS and BP as above (Carey)  SS: from 1,633 enrolled 1,580 (97%) completed 24 week interview	all as above (Carey)	Direct Costs: Logistic Regression model to predict cost for seeing only index provider 19% (95%) of patients visiting D.C. were likely to see other providers  Adjusted mean cost for seeing index provider that could include D.C. only index provider \$439 >1 index provider \$1,137  Indirect costs: not evaluated	Insurance Coverage: not specified
Cherkin <sup>14</sup> 2003	SD: RCT November 1993 to September 1995  CS: CID  BP: ALBP of at least 7 days from initial M.D. visit  SS: D.C. = 122 PT = 133 Educational booklet=66	Payer: -study treatments were paid by the study -non-study treatments were covered by the subjects health insurance with a \$5 or \$10 co-payment  Cost Perspective: private insurance payer  Health Outcomes: -Roland Disability Scale score -Bothersome rating -Satisfaction with care  Adverse Events: not evaluated	Direct costs: -costs in 1995 USD -included all costs to the HMO  Costs per unit for visit: (mean cost per subject) D.C.= \$28 (\$185) PT=\$50 (\$221) Educational booklet=\$1 (\$1)  Mean costs over a 2 year period D.C.: \$429 PT: \$437 Educational Booklet: \$153  Indirect costs: "Out of pocket expenses" not included	-total costs of care to the HMO over a 2 year period differed by 2% between D.C. and PT -the educational booklet group costs were approximately half that of either treatment group -dysfunction was greater in the educational booklet group at endpoint  Seeking additional care other than index provider D.C.=8% PT=9% Educational booklet =18%  Insurance Coverage not applicable

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective Health Outcomes Adverse Events	Direct costs: Indirect costs:	Other Findings With: Insurance Coverage
Eisenburg <sup>15</sup> 2007	<p>SD: RCT April 2001 to July 2003</p> <p>CS: CID (data for CEA)</p> <p>BP: ALBP less than 21 days with a score of 3 or greater on a pain scale from 0 to 10</p> <p>SS: Usual Care = 148 Choice Care = 296</p>	<p>Payer: Harvard Pilgrim Healthcare and Harvard Vanguard Medical Associates (data from electronic medical record, pharmacy, and claims database)</p> <p>First 10 visits did not require co-payment; visits 11 to 15 required 50% co-payment</p> <p>Cost perspective: private insurance payer</p> <p>Health Outcomes: -Roland Disability Scale score -Bothersome rating -Satisfaction with care</p> <p>Adverse Events: “Did you have problems with your last treatment”</p>	<p>Direct costs: costs in 2003 USD costs were assigned using the Medicare reimbursement for encounter and the “Red Book” for prescriptions</p> <p>Average Total costs for treatment:</p> <p><u>12 weeks Before study enrolment</u> Usual Care (M.D., NSAIDS, Education) Average cost \$393 Median Cost \$126</p> <p>Choice Care (D.C., AT, MT) Average Cost \$247 Median Cost \$131</p> <p><u>&gt; 12 weeks after study enrolment</u> Usual Care Average cost \$521 Median cost \$207</p> <p>Choice Care Average cost \$476 Median cost \$185 Mean reimbursement to provider \$343 Median reimbursement to provider \$244</p> <p>Indirect costs: not collected</p>	<p>after controlling for pre-study costs, choice of care group cost \$99 less primarily due to a reduction in costs for accessing a conventional provider, resulting in an average \$244 increase in patient cost after 12 weeks of treatment</p> <p>patients selected massage over chiropractic</p> <p>all participants covered by private insurance</p>



**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective Health Outcomes Adverse Events	Direct costs: Indirect costs:	Other Findings With: Insurance Coverage
Haas <sup>16</sup> 2005	<p>SD: prospective longitudinal study 1994-1996</p> <p>CS: CEA</p> <p>BP: -ALBP -CLBP &gt; than 7 weeks</p> <p>SS: 2,827 patients from 69 D.C. and 111 M.D. practices</p>	<p>Payer: Private insurance workers' Compensation Medicaid, Medicare, HMO</p> <p>Cost Perspective: mixed public and private payer</p> <p>-Health Outcomes: -SF12 -VAS Pain score -Oswestry Disability questionnaire -Satisfaction with care</p> <p>Adverse Events: "Did you have problems with your last treatment"</p>	<p>Direct costs: Costs in 1995 USD and included the following: Office based visits, and imputed costs for imaging, surgical consultation, and PT</p> <p>Total unadjusted costs: <u>3 months Acute vs Chronic</u> D.C.= \$171 (SD \$202) / \$180+/- \$209 M.D.= \$141 (SD \$183) / \$212 +/- \$253</p> <p><u>12 months Acute vs Chronic</u> D.C.= \$218+/- \$305 / \$232+/- \$311 M.D.= \$176 +/- \$245 / \$281 +/- \$355</p> <p><u>3 months Acute vs Chronic</u> CER1* Pain (MDF=10.5)= \$25.7/ \$13.5 Disability (MDF=8.8)= \$23.8/ \$16.1</p> <p>CER2* Pain (MDF = 10.5)= \$11.7/ \$0.4 Disability (MDF = 8.8)= \$10.8/ \$0.5</p> <p><u>12 months Acute versus Chronic</u> CER1* Pain (MDF = 7.3)= \$31.2 / \$21.6 Disability (MDF = 5.4) = \$41.7 / \$29.2</p> <p>CER2* Pain (MDF = 7.3) = \$12.0 / \$0.1 Disability (MDF = 5.4) = \$16.1 / \$0.1</p> <p>Indirect costs: not collected</p>	<p>Relative to M.D. total costs for D.C. were: 22% greater for acute patients 16% less for chronic patients</p> <p>Insurance Coverage D.C. Chronic patients: no insurance = 47% health insurance = 39% workers compensation = 6% Medicaid/Oregon Health plan = 3%</p> <p>Insurance Coverage M.D. Chronic patients: no insurance = 6% health insurance = 77% workers compensation = 7% Medicaid/Oregon Health plan = 20%</p> <p>Acute patients D.C.: no insurance = 42% health insurance = 42% workers' Compensation = 7% Medicaid/ Oregon Health plan=1%</p> <p>Acute patients M.D.: no insurance = 8% health insurance = 76% workers' Compensation = 10% Medicaid/Oregon Health plan = 11%</p>

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective Health Outcomes Adverse Events	Direct costs: Indirect costs:	Other Findings With: Insurance Coverage
Kominski <sup>17</sup> 2005	SD: RCT  CS: CID  BP: LBP (not on workers compensation)  SS: 664/681 (97.5%) completed 28 month follow-up	Payer: HMO  Health Outcomes: -SF36 -Pain scale  Adverse Events: not reported	Direct costs: -costs expressed as USD (year not specified) for care over 18 months -costs included charges for diagnostic and therapeutic modalities from any provider PT, low back surgery, injection and other outpatient services -some patients did have to make co-payments -pharmaceutical costs were not included  Mean costs per treatment 18 months M.D. = \$463 M.D. + PT = \$765 D.C. = \$550 D.C. + PM = \$565  Adjusted mean costs M.D. = \$369 M.D. + PT = \$760 D.C. = \$560 D.C. + PM = \$579  Relative cost differences D.C. = 71.8% more expensive than M.D. D.C. + PM = 13.5% more expensive than D.C. M.D. + PT = 114.0% more expensive than M.D.  Indirect costs: not collected	PT doubled the amount of care relative to M.D.  PM did not affect costs for D.C.  Insurance Coverage: all members of HMO

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

<b>Author Year</b>	<b>Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)</b>	<b>Payer Cost Perspective Health Outcomes Adverse Events</b>	<b>Direct costs: Indirect costs:</b>	<b>Other Findings With: Insurance Coverage</b>
Lind <sup>18</sup> 2005	SD: Retrospective database for 2002  CS: CID  BP: ALBP and CLBP  SS: 104,358/601,044 had back pain and were eligible for study	Payer: private insurer in Washington state  Cost Perspective: private insurance payer  Health Outcomes: not evaluated  Adverse events: not evaluated	Direct costs: -costs 2002 USD -costs included maximum allowed amount by the insurance company -costs may have included visits, and procedures allowed by the insurance company policy  CAM providers consisted of D.C., AT, MT, and ND  Per visit: CON: \$128 (Sd \$173) CAM only: \$50 (Sd \$28) MIX: \$84 (Sd \$68)  Mean Total Expenditures: CON: \$506 (Sd \$954) CAM only: \$342 (Sd \$429) MIX: \$1,079 (Sd \$1,185)  Indirect costs: Not evaluated	CAM users have fewer visits not related to back pain and lower annual costs for all reasons  Insurance Coverage all members insured

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

<b>Author Year</b>	<b>Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)</b>	<b>Payer Cost Perspective Health Outcomes Adverse Events</b>	<b>Direct costs: Indirect costs:</b>	<b>Other Findings With: Insurance Coverage</b>
Nyiendo <sup>19</sup> 1985	SD: case control  CS: CID  BP: Disabling LBP  SS: 94 patients D.C. 107 patients M.D.	Payer: workers' compensation in Oregon  Cost perspective: payer  Health Outcomes: not evaluated  Adverse events: not evaluated	Direct costs: Costs in 1985 USD Costs include treatment, diagnostic tests and drugs  All cases: % of total costs (D.C. vs M.D.) Office visits: 12.2% vs 13.3% Hospital surgery: NA vs 15.5% Physical therapy: 23.1% vs 18.1% Manipulation: 38.4% vs 0.0%  All cases: % of total costs (D.C. vs M.D.) Diagnosis: 7.9% vs 20.2% Treatment: 75.8% vs 66.9% Other: 16.3% vs 12.8 %  All cases: Mean dollars per case (D.C. vs M.D.) Diagnostics: \$161 vs \$258 Treatment: \$1,551 vs \$854 Medical related: \$335 vs \$163 Total medical: \$2,047 vs \$1,275  Indirect costs: not evaluated	all participants on workers compensation

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

<b>Author Year</b>	<b>Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)</b>	<b>Payer Cost Perspective Health Outcomes Adverse Events</b>	<b>Direct costs: Indirect costs:</b>	<b>Other Findings With: Insurance Coverage</b>
Stano <sup>20</sup> 2002	SD: SGPS  CS: CID  BP: ALBP and CLBP  Collected from December 1994 to June 1996  SS: 2,872 patients D.C.: 1,524 M.D.: 739 NRM: 611 RM: 128	Payer: -no insurance -private insurance -workers compensation  Cost Perspective: payers  Health Outcomes: measured at baseline only  Adverse events: not evaluated	Direct costs: Costs in 1995 USD Current Procedural Terminology was converted to relative value units for D.C. and M.D. care and 1995 Medicare conversion factor  Mean costs per patient D.C. = \$214 (Sd \$284) M.D. = \$123 (SD \$128) NRM = \$103 (Sd \$83) RM = \$217 (Sd \$228)  Indirect costs: not evaluated	Insurance Coverage None/ Insurance / workers' compensation D.C.=42%/ 51%/ 7% NRM=7%/ 86%/ 7% RM=3% / 81%/ 16%

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

<b>Author Year</b>	<b>Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)</b>	<b>Payer Cost Perspective Health Outcomes Adverse Events</b>	<b>Direct costs: Indirect costs:</b>	<b>Other Findings With: Insurance Coverage</b>
Stano <sup>21</sup> 1996	SD: Retrospective database July 1988 to June 1990  CS: CID  BP: LBP  SS: 43,476 patients based on back ICD codes; from this 6,183 patients and 8,018 episodes of care	Payer: private insurance  Cost perspective: payer  Health Outcomes: severity of condition or disease staging  Adverse events: not evaluated	Direct costs: costs in USD episode of care includes all health services incurred to treat back condition; in some cases this may involve cost associated with other illnesses  First episode costs mean total payments D.C. = \$518; M.D. = \$1,020  First episode costs mean outpatient payments D.C. = \$447; M.D. = \$598  Multiple Episodes: Mean total payment for first 2 episodes D.C. = \$635; M.D. = \$1,272  Mean outpatient payments for first 2 episodes D.C. = \$658; M.D. = \$1,505  Indirect costs: not evaluated	Insurance Coverage -plans of those evaluated had no D.C. restrictions (76%) or some chiropractic restrictions (24%) with respect to total visit dollars -database analysis is confounded by this potential restriction -patients choosing D.C. have higher copayments but disproportionately carry comprehensive rather than basic plus insurance coverage

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective Health Outcomes Adverse Events	Direct costs: Indirect costs:	Other Findings With: Insurance Coverage
Smith <sup>22</sup> 1997	SD, CS as above (Stano)  BP: recurrent LBP  SS: initial patients with recurrences 1,215 from 7,077 had recurrent episodes	all as above (Stano)	Direct costs: costs in USD for total payments estimated for persons with recurrent episodes  First episode provider Total costs both 1 <sup>st</sup> and 2 <sup>nd</sup> episode D.C. = \$1,294; M.D. = \$2,778  First and second episode provider D.C. = \$1,258; M.D. = \$2,390  For patients with 3 episodes of care D.C. = \$1,038; M.D. = \$3,068  Indirect costs: not evaluated	D.C. episodes exhibit longer contact but not higher costs  Insurance Coverage: not applicable, all subjects covered
Wasiak <sup>23</sup> 1998	SD: Retrospective database 1999 to 2002  CS: CID  SS: 8,894 from 13,734 claimants	Payer: private workers' compensation claims database  Cost perspective: payer  Health Outcomes: not reported  Adverse events: not evaluated	Direct costs: -costs stratified by year from 1999 to 2002 USD -costs included visits and all other services performed on the same day and all costs associated with services for chiropractic care -costs adjusted to constant year dollars using the medical care component of the Consumer Price Index  Mean cost for individual (adjusted for geography) for D.C. for 7 states that range from 1999: \$350 to \$1,162 2000: \$298 to \$1,240 2001: \$274 to \$1,103 2002: \$259 to \$1,478  Indirect costs: not evaluated	Insurance Coverage: all on workers' compensation

**Appendix Table 3. Study characteristics and results for studies evaluating costs for CAM services in persons with low back pain (continued)**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective Health Outcomes Adverse Events	Direct costs: Indirect costs:	Other Findings With: Insurance Coverage
Williams <sup>24</sup> 1998	SD: Retrospective database  CS: CID  BP: CLBP  Collected from 1988 to 1992  SS: 520 from 29,056 claimants in 4 states	Payer: workers compensation claim data from the National Council on Compensation Insurance  Cost Perspective: payer  Health Outcomes: not reported  Adverse events: not evaluated	Direct costs: -costs in USD (year not specified) -lost time injury costs, subdivided by health care services -costs were presented in terms of duration of work disability for low back pain  D.C. Mean Costs <30 days: \$286 (n = 53) 30-90 days: \$525 (n = 30) 91-180 days: \$396 (n = 14) >180 days: \$575 (n = 19) Total: \$409 (n = 116)  Miscellaneous non medical ( AT, MT, other) Mean Costs: <30 days: \$138 (n = 138) 30-90 days: \$448 (n = 94) 91-180 days: \$5,547 (n = 52) >180 days: \$10,931 (n = 64) Total: \$47,403 (n = 348)  PT Mean Costs: <30 days: \$358 (n = 124) 30-90 days: \$965 (n = 118) 91-180 days: \$1,231 (n = 50) >180 days: \$2,264 (n = 55) Total: \$995 (n = 323)  Indirect costs: not evaluated	relative to PT costs (20%), D.C. were a smaller percent of overall costs (3%)  miscellaneous costs which could have included massage, acupuncture, education, etc) were also provided; difficult to know what proportion of these are truly CAM  Insurance Coverage: all covered by workers' compensation



**Appendix Table 4. Study characteristics and results for studies evaluating costs for CAM services in persons with unspecified or combined back pain**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective	Direct Costs / Indirect Costs	Other Findings
Jarvis <sup>25</sup> 1991	SD: Retrospective database and chart extraction 1986  CS: CID  BP: Combined back pain  SS: 3,062 from 7,551 files (40.6%)  Comparison: M.D. vs D.C. Stratified by disease code	Payer: workers compensation fund of Utah  Cost perspective: payer  Health Outcomes: not evaluated  Adverse Events: not evaluated	Direct Costs: costs in 1985 USD costs included; care and compensation  Compensation costs: M.D. = \$668.39 D.C. = \$68.38  Costs of care: M.D. = \$684.15 D.C. = \$526.84  costs stratified by ICD9 code for back pain not presented  Indirect Costs not evaluated	-mean number of treatment visits greater for D.C. as were the days of care -compensation costs were much less for the D.C.  Insurance Coverage: all on workers' compensation

Abbreviations: CID = cost identification; CS = cost study; D.C. = doctor of chiropractic; IT = internist; MT = massage therapist; NRM = non-referred medical; OP = osteopath; OS= orthopedic surgeon; PCP=primary care physician; PM = physical modalities; PT = physical therapist; RM = referred medical; USD=United States dollars

**Appendix Table 4. Study characteristics and results for studies evaluating costs for CAM services in persons with unspecified or combined back pain (continued)**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective	Direct Costs / Indirect Costs	Other Findings
Shekelle <sup>26</sup> 1995	SD: SGPS 3 to 5 year interval  CS: CID  BP: Unspecified back pain  SS: 1,020 episodes of care by 686 persons and 8,825 visits  Comparison D.C. vs PCP vs OS, vs IT vs OP vs Other	Payer: RAND health insurance  Cost perspective: payer  Health Outcomes: not reported  Adverse Events: not evaluated	Direct Costs costs in 1982 USD  Total costs included hospital care, physician services, drugs, services, injections, supplies etc.  Mean cost per visit. D.C. = \$19.45 (SE, 0.15) PCP = \$20.21 (SE 1.93) OS = \$38.53 (SE 4.16) IT = \$21.85 (SE 1.05) OP = \$22.18 (SE0.66) Other = \$37.66 (SE 2.16)  Mean Total cost per episode D.C. = \$281 (95% CI, 242-320) PCP = \$120 (95% CI, 89-150) OS = \$281 (95% CI, 172-390 ) IT = \$218 (95% CI, 143-294) OP = \$280 (95% CI, 59-501) Other = \$239 (95% CI, 139-339)  Mean Outpatient cost per visit D.C. = \$281 (95% CI, 242-320) PCP = \$120 (95% CI, 89-150) OS = \$281 (95% CI, 172-390 ) IT = \$218 (95% CI, 143-294) OP = \$280 (95% CI, 59-501) Other = \$239 (95% CI, 139-339)  Indirect Costs Not evaluated	Insurance Coverage: -all families covered by 1 of 14 fee for service health plans -all plans covered chiropractic

**Appendix Table 4. Study characteristics and results for studies evaluating costs for CAM services in persons with unspecified or combined back pain (continued)**

Author Year	Study Design (SD) Cost Study (CS) Back Pain (BP) Sample Size (SS)	Payer Cost Perspective	Direct Costs / Indirect Costs	Other Findings
Legoretta <sup>27</sup>  2004	SD: Retrospective database 1997 to 2001  CS: CID  BP: combined neck and back pain  SS: 707,690 with D.C. coverage/ 1,001,995 without coverage: 141,616 had D.C. coverage and 189,923 no D.C. coverage proportion with back pain alone was not specified	Payer: health care managed network in California  Cost perspective: payer  Health Outcomes: not evaluated  Adverse Events: not evaluated	Direct Costs Costs in USD (year not specified).  Costs included: -outpatient services, imaging methods, lumbar spine surgical procedures, and inpatient stays -physiotherapy and drug costs were excluded  Total cost per patient over 4 years (all episodes): With coverage for D.C. = \$522 Without coverage = \$567  Average cost per episode over 4 years: With coverage for D.C. = \$289 Without coverage = \$399  Indirect Costs: not evaluated	Insurance Coverage direct costs

## Reference List for Appendix C

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## Appendix D – Excluded Studies

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## **Appendix E – Partners and Technical Expert Panel**

### **Task Order Officer**

Margaret Coopey, R.N., M.G.A., M.P.S.  
Agency for Healthcare Research and Quality

### **Partners from The National Center for Complementary and Alternative Medicine**

Partap Khalsa, D.C., Ph.D, DABCO  
National Institute of Health  
The National Center for Complementary and Alternative Medicine

Richard Nahin, M.D.  
National Institute of Health  
The National Center for Complementary and Alternative Medicine

### **Technical Expert Panel**

Heather Boon, B.Sc.Pharm., Ph.D.  
Leslie Dan Faculty of Pharmacy  
University of Toronto,  
Toronto, ON

Brian M. Berman, M.D.  
The Center for Integrative Medicine  
University of Maryland School of Medicine  
Baltimore, MD

William G. Johnson, Ph.D.  
Director, Center for Health Information and Research  
Arizona State University  
Tempe, Arizona

Max H. Pittler, M.D., Ph.D.  
Senior Research Fellow  
Peninsula Medical School, Complementary Medicine  
Universities of Exeter & Plymouth  
Exeter, U.K.

Dugald Seely, N.D., M.Sc.  
Director of Research, Department of Clinical Epidemiology  
Canadian College of Naturopathic Medicine  
Toronto, ON

**Peer Reviewers**

Carlo Ammendolia, D.C., M.Sc., Ph.D.  
Director, Spine Clinic, Mount Sinai Hospital  
Assistant Professor, Department of Health Policy, Management and Evaluation  
University of Toronto  
Toronto, ON

Tim Carey, M.D., M.P.H  
Sheps Center for Health Services Research  
University of North Carolina, Chapel Hill  
Chapel Hill, NC

Dan Cherkin, Ph.D  
Senior Scientific Investigator  
Group Health Center for Health Studies  
Seattle, WA 98101

Andrea D. Furlan, M.D., Ph.D.  
Assistant Professor, Division of Psychiatry, Department of Medicine, University of Toronto  
Associate Scientist, Institute for Work & Health  
Clinician-scientist, Toronto Rehabilitation Institute  
Toronto, ON

Maria A. Hondras, D.C., M.P.H.  
Associate Professor  
Palmer Center for Chiropractic Research  
Davenport, IA

Dugald Seely, N.D., M.Sc.  
Director of Research  
Department of Clinical Epidemiology  
Canadian College of Naturopathic Medicine  
Toronto, ON