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Complementary and Alternative Medicine in the United States

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Background

The medical landscape of the United States is shared by a variety of approaches to health and health care. Conventional medicine (also called Western or allopathic medicine) accounts for the majority of medical services delivered in US hospitals and physician clinics. Even so, complementary and alternative medicine (CAM) has become increasingly popular among Americans over the past several decades.[1,2,3,4,5] In general, Americans use CAM therapies to supplement rather than replace conventional medicine.[6] Medical pluralism in the US has important implications for individual patient care and for the health care system as a whole.

Definition

CAM encompasses a wide range of health care systems and practices aimed at preventing or treating disease. As defined by the National Center for Complementary and Alternative Medicine, CAM therapies are those not considered part of conventional medicine as practiced by medical doctors, doctors of osteopathy, and allied health professionals.[7] While no formal classification scheme exists, CAM practices can be grouped into five major categories: natural products (i.e., dietary supplements); mind-body medicine (i.e., meditation, acupuncture); manipulative and body-based practices (i.e., massage, chiropractic spinal manipulation); alternative medical systems (i.e., homeopathy, naturopathy, traditional Chinese medicine); and energy healing (i.e., magnet therapy, Reiki). Complementary medicine refers to use of these practices in concert with conventional treatments. Alternative medicine refers to their use in place of conventional medicine. Integrative medicine combines conventional medicine with CAM therapies of proven safety and effectiveness.

Research

Research evaluating CAM is ongoing. While some conventional clinical practice guidelines already incorporate CAM therapies for which there is evidence of safety and effectiveness (i.e., acupuncture for chronic low back pain),[8,9] rigorous, well-designed clinical trials are lacking for most CAM therapies.[10,11,12] To address this need, the National Center for Complementary and Alternative Medicine (NCCAM), a division of the National Institutes of Health, was established to sponsor and conduct research on CAM. To date, 263 clinical trials have been completed under NCCAM sponsorship.[13]

Prevalence

According to the 2007 National Health Interview Survey (NHIS), approximately 38% of American adults and 12% of children used some type of CAM during the prior 12 months (4).[14] The survey included questions on 10 practitioner-based CAM therapies (i.e., acupuncture) and 26 self-care therapies (i.e., natural products) (Table 1). Folk medicine practices, prayer, and exercise were not included in the survey. The most commonly used therapies among adults were nonvitamin, nonmineral (i.e., herbal) natural products (18%); deep-breathing exercises (13%); meditation (9%); chiropractic or osteopathic manipulation (9%); massage (8%); and yoga (6%). Among adults who

used CAM therapies, back pain (17.1%), neck pain (5.9%), and joint pain (5.2%) were the most common conditions prompting CAM use.

Table 1:

CAM Therapies Included in the 2007 NHIS: An asterisk (*) indicates a practitioner-based therapy. For definitions of these therapies, see the full report or contact the NCCAM Clearinghouse *(see page 4)*.

Acupuncture*	Meditation
Ayurveda*	Movement therapies
Biofeedback*	Natural products (nonvitamin and non-mineral, such as herbs and other products from plants, enzymes, etc.)
Chelation therapy*	Naturopathy*
Chiropractic or osteopathic manipulation*	Progressive relaxation
Deep breathing exercises	Qi gong
Diet-based therapies	Tai chi
Energy healing therapy/Reiki*	Traditional healers*
Guided imagery	Yoga
Homeopathic treatment	
Hypnosis*	
Massage*	

2007 Statistics on CAM Use in the United States. National Center for Complementary and Alternative Medicine, 2007. (Accessed August 5, 2010, at http://nccam.nih.gov/news/camstats/2007/.)

Cost

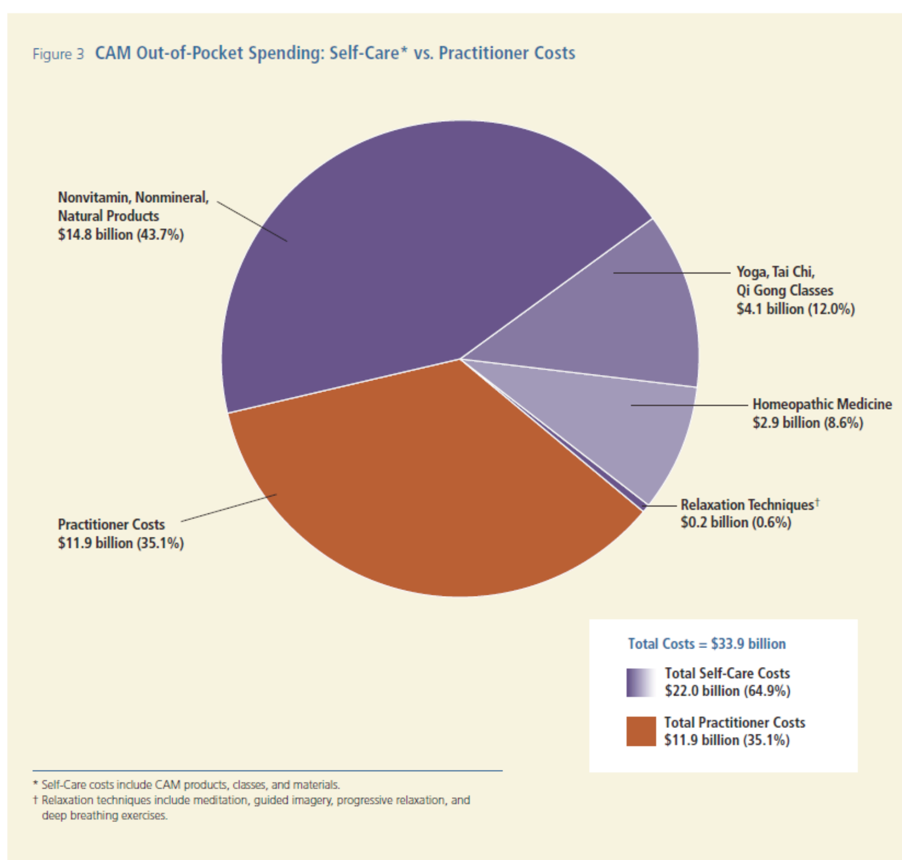
The majority of CAM services and products are paid for out of pocket, and figures estimating CAM costs are limited to this metric.[15,16,17] According to the 2007 NHIS, US adults spent $33.9 billion out of pocket on CAM in the previous year.[18] This amount was equivalent to 1.5% of total US health care expenditures and 11.2% of out-of-pocket expenditures in 2007.[19] Two-thirds ($22.0 billion) of CAM out-of-pocket spending was for self-care purchases of CAM products, classes, and materials; one third ($11.9 billion) was spent on practitioner visits (Fig. 1). For comparison, in 2007 the American public spent $47.6 billion out of pocket on pharmaceuticals and $49.6 billion out of pocket for conventional physician services.[20]

Insurance Coverage

Despite high demand and out-of-pocket spending, rates of insurance coverage for CAM remain low.[21,22,23] An increasing number of US insurers are offering partial coverage,[24,25,26] but CAM therapies are typically subject to stringent utilization limits and high cost-sharing levels.[27] Medicare coverage for practitioner-based CAM interventions is limited and varies according to the specific medical condition and treatment. For example, Medicare covers chiropractic services and biofeedback only for spinal subluxation and pathological muscle abnormalities, respectively.[28] Conversely, Medicare does not cover acupuncture for any therapeutic purpose. A complete, searchable listing of national coverage determinations for all medical services and products

(including CAM therapies) can be found online at the Medicare Coverage Database (www.cms.gov/mcd/overview.asp).

Figure 1



Statistics on CAM Costs. National Center for Complementary and Alternative Medicine. (Accessed August 5, 2010, at http://nccam.nih.gov/news/camstats/costs/.)

For both private and public insurers, the most common reasons for noncoverage of CAM therapies are a lack of evidence for clinical efficacy, minimal cost-effectiveness research, and the absence of practice standards.[29,30] Insurance coverage of a CAM therapy is independently associated with frequent use of a corresponding CAM provider.[31] Therefore, future increases in CAM insurance coverage could have a considerable impact on CAM provider utilization.

Providers

Although most CAM use takes the form of self-care (i.e., natural products, yoga, meditation),[32,33,34] practitioner visits still account for one-third of all CAM spending. In 2007, 38.1 million US adults made an estimated 354.2 million visits (1,592 visits per 1,000 adults) to CAM practitioners (compared to 902.0 million visits to physicians).[35,36] Chiropractic manipulation, massage, relaxation techniques, movement therapies, and acupuncture made up the large majority of these visits. Earlier surveys revealed that approximately 20% of CAM users account for more than 75% of visits made to CAM providers.[37]

Practitioner-based CAM therapies are available in a variety of settings. Most commonly, CAM providers offer care in standalone private practices. The main alternative to this setting is the integrative medicine (IM) clinic, which combines conventional medicine (often primary care) with CAM therapies for which there is some evidence of safety and effectiveness.[38] Both academic IM centers and private IM clinics are increasing in number in the US.[39] The former includes the 44 member institutions of the Consortium of Academic Health Centers for Integrative Medicine.[40]

Despite the prevalence of CAM use in conjunction with conventional medical care, survey data indicate that less than 40% of CAM therapies are discussed with medical doctors.[41,42] Given that most CAM is self-care, this infrequent communication suggests that a substantial portion of CAM is performed without input from physicians or CAM providers.

Government Regulation

Government regulation of CAM takes two broad forms: provider credentialing and dietary supplement monitoring. Credentialing is the process of assessing and validating health care practitioners' qualifications to provide patient care. This responsibility is shared by professional organizations and state governments. CAM professional organizations certify practitioners via education program accreditation and standardized examinations. State governments credential CAM providers via licensure, which grants the right to practice a legislatively designated range of services. In addition to specified training, examinations, and continuing education, professional organization certification is typically a prerequisite for licensure. Type of licensure, requirements, and scope of practice vary significantly according to state and type of CAM provider. For example, chiropractors are licensed in all 50 states, acupuncturists in 42 states, and naturopathic doctors in 15 states.[43,44]

Dietary supplements are regulated by the federal government through the US Food and Drug Administration (FDA).[45] The Dietary Supplement Health and Education Act (DSHEA) of 1994 defines a dietary supplement as "a product taken by mouth that contains a 'dietary ingredient' intended to supplement the diet" (i.e., vitamins, minerals, botanicals, amino acids).[46] Dietary supplements are treated as a category of foods, not drugs. FDA approval of safety and effectiveness is not required before marketing, but DSHEA places responsibility on manufacturers to ensure the safety of their supplements. Post-marketing FDA responsibilities include monitoring safety (i.e., adverse-event reporting) and product information (i.e., label claims, package inserts). The FDA must demonstrate that a dietary supplement is unsafe before it can take restrictive action. However, manufacturers must forward to the FDA any evidence of adverse effects. Certain information must appear on dietary supplement labels; a supplement cannot be labeled as a prevention, treatment, or cure for a specific disease or condition (in which case it would be considered a drug and subject to FDA approval). In addition to FDA regulation, the Federal Trade Commission monitors dietary supplement advertising.

The presence of CAM in the US affects all aspects of health care delivery. In 2005, the Institute of Medicine issued a report examining the major scientific, policy, and practice issues related to CAM.[47] The report provided a roadmap for the future of CAM, emphasizing systematic research, education expansion and standardization, and regulatory policy revisions. Importantly, it stressed the application of uniform rules for testing the effectiveness and safety of all therapies (both CAM and non-CAM).[48] The ultimate goal is to create a comprehensive, evidence-based health care system with an unbiased approach to diverse experiences of health and healing.

This vignette focuses on the case of Rob Packard, a postman with chronic, nonspecific low back pain. Rob is one of the 70% of individuals in Western industrialized countries who experiences back pain at some point in their lives.[49] In the United States, low back pain is the fifth most common reason for all physician visits.[50,51,52] Rob's treatment includes a variety of conventional and complementary medical services. His search for effective therapy eventually leads him to the Marino Center, an integrative medicine clinic in Cambridge, Massachusetts.

Part I: An Intractable Pain

Rob Packard is a 49-year-old postman who delivers mail in Cambridge, Massachusetts. Recently, Rob began to experience intermittent episodes of low back pain. Initially Rob worked through the discomfort, thinking that he had simply strained a muscle. However, the pain has persisted for several weeks. Rob decides to see his primary care physician, Dr. James Stone—a member of one of the major medical group practices in eastern Massachusetts.

At his initial visit, Rob describes his intermittent pain as a dull ache (5 out of 10) in the lumbosacral area. Prolonged standing, sitting, and carrying of his mail bag exacerbate the discomfort. Rob is concerned that the pain will continue to worsen and that he will no longer be able to work. Dr. Stone conducts a focused history and physical examination to assess possible causes of his low back pain. Rob has no significant risk factors, signs, or symptoms predictive of neoplasm, vertebral infection, vertebral compression fracture, or ankylosing spondylitis. The results of a neurologic examination—including a straight-leg-raise test and evaluation for pseudoclaudication—are normal, making lumbar disc herniation or spinal stenosis unlikely.[53]

Dr. Stone shares these findings with Rob and discusses the nature of his nonspecific low back pain, which cannot be reliably attributed to a specific disease or structural abnormality. This disorder accounts for 85% of low back pain cases,[54] and Dr. Stone informs Rob that 90% of individuals with acute low back pain improve substantially within six weeks.[55] For the time being, he instructs Rob to take acetaminophen daily, remain active, and apply a heat pad for short-term relief. He also provides Rob with a self-care educational handout for low back pain. At the end of the 15-minute visit, Dr. Stone arranges for a four-week follow-up appointment.

One month later, Rob reports persistent intermittent low back pain. Dr. Stone recommends a medication switch to ibuprofen in addition to physical therapy and continued self-care (active lifestyle, application of superficial heat). However, the pain continues, and at a third visit Dr. Stone prescribes the prescription-strength NSAID piroxicam (Feldene) and a proton pump inhibitor. As one who believes in the body's natural ability to heal, Rob hesitates to try yet another drug. He does so reluctantly, but after four weeks the pain does not subside, and despite taking a PPI, he develops mild gastritis. His physician now suggests that Rob go to a pain clinic to have steroid injections into his back. Rob senses that Dr. Stone is aggravated, and he feels that he has become a bother to him.

Rob is frustrated with his situation: chronic pain, increasing difficulty completing his mail route, brief meetings with his doctor, ineffective drugs, and time-consuming physical therapy. He does not like the idea of continuing to try new medications. Rob decides to check the Internet for information on chronic low back pain. On forums and popular medical websites, Rob sees mention of numerous nonpharmacologic treatments for low back pain, including spinal manipulation, yoga, acupuncture, and even herbal supplements. He also navigates to the National Center for Complementary and Alternative Medicine website, where he learns more about these particular interventions. He wonders if he might benefit from some of these therapies.

Discussion Questions

- What features of the health care system and of Rob's health problem led him to explore complementary treatment options?
- What issues related to CAM therapies and providers should Rob consider before trying a new intervention?

Part II: The Marino Center for Integrative Health

One morning, while in conversation with a resident on his mail route, Rob mentions his persistent low back pain, unsuccessful treatment courses, and interest in complementary therapies. The resident tells Rob about the Marino Center in Cambridge—an integrative medicine clinic where she receives primary care. She notes that the center offers traditional primary care as well as complementary and alternative medical services.

That evening, Rob browses the Marino Center website. He reads that it is a not-for-profit medical organization with a mission to "integrate scientifically and empirically demonstrated conventional and complementary healing traditions to improve health."[56] The center offers therapies such as acupuncture, chiropractic, massage, and holistic pain management. Rob is impressed by the emphasis placed on holistic evaluation, individual attention, personalized treatment, and patient participation. These components seemed to be lacking in his relationship with Dr. Stone. Rob finds on the website that the Marino Center accepts his insurance plan; the next morning he calls to set up an appointment.

Discussion Question

- What is an integrative medicine clinic? In what ways does the Marino Center differ from a conventional primary care clinic?

Part III: Changing Directions

Two weeks later, Rob arrives at the Marino Center for an office visit with Dr. Julia Walls, a primary care physician. Over the course of an hour, Dr. Walls and Rob review Rob's medical record and previous treatments for his chronic low back pain. Dr. Walls explains that all of his treatments were consistent with current clinical practice guidelines.[57,58] While most patients experience improvement with these therapies, some do not respond. Dr. Walls goes on to say that several evidence-based, nonpharmacologic options are recommended for such individuals, including acupuncture, massage therapy, chiropractic spinal manipulation, and yoga.[59,60,61] All of these therapies are offered onsite at the Marino Center.

Dr. Walls asks Rob for his thoughts on his low back pain, such as possible sources or causes and what he thinks might help. Based on his online reading and desire for a more "natural" solution, Rob feels that acupuncture might be appropriate for him. He asks Dr. Walls for more information. She begins by describing the traditional Chinese medicine concept of *qi*—the body's vital energy that flows along 12 primary and 8 secondary meridians. Internal disharmony is thought to cause blockage of *qi*, which manifests as tenderness on palpation. The insertion of fine, sterile, solid metallic acupuncture needles into the skin at specific points along the meridians is intended to restore the proper flow of *qi* and relieve pain.[62,63]

Dr. Walls then shares with Rob some of the clinical research on the effects of acupuncture. Two recent meta-analyses provide evidence that both real acupuncture and sham acupuncture (shallow insertion of needles at non-acupuncture points) reduce chronic low back pain.[64,65] Real acupuncture is not proven to be superior to sham acupuncture. Nonetheless, numerous clinical trials suggest that acupuncture (real or sham) is more effective than conventional care. Thus, it is recommended as possible treatment for individuals with chronic low back pain who do not respond to self-care.[66,67]

Rob finds that his insurance does not cover acupuncture treatments. Dr. Walls informs him that each session will cost $100, which Rob must pay out of pocket. Considering the failure of other treatment options, his need to regain efficiency at work, and the evidence provided by Dr. Walls, Rob requests acupuncture. Dr. Walls evaluates Rob for contraindications to acupuncture and informs him of rare yet possible adverse events. To rule out any undetected, severe structural abnormalities, she orders an MRI of the lumbar spine. She then recommends a course of 10 acupuncture treatments over eight weeks to be provided by the Marino Center licensed acupuncturist. In addition, she encourages him to stay active and to perform specific stretching and strengthening exercises that he has already learned through physical therapy.
His MRI shows moderate degenerative disk disease at the L4-L5 and L5-S1 levels but no evidence of central spinal stenosis or nerve-root impingement. A follow-up appointment is scheduled for six weeks later.

One week after his first visit, Rob comes to the Marino Center for his first acupuncture treatment. He finds it painless and relaxing. The acupuncturist provides highly individualized attention. She crafts a pattern of insertion sites specific to Rob's history and physical examination yet grounded in the common points for low back pain.[68] Following the first session, Rob notices a slight reduction in the severity of his pain. After 10 visits Rob reports 90% recovery, but he continues to have occasional relapses if he does not manage his stress level and continue to exercise.

Discussion Questions

- What factors do government programs and insurance companies consider when deciding whether to provide reimbursement for a particular medical service?
- What specific therapies can/should be offered in conventional and integrative medicine clinics? If there is no conclusive evidence for the effect of a particular therapy, can/should it still be offered? (In answering this question, consider the common practice of off-label drug use.)

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[1] Eisenberg DM, Kessler RC, Foster C, Norlock FE, Calkins DR, Delbanco TL. Unconventional medicine in the United States. Prevalence, costs, and patterns of use. N Engl J Med 1993;328:246-52.
[2] Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey. JAMA 1998;280:1569-75.
[3] Barnes PM, Powell-Griner E, McFann K, Nahin RL. Complementary and alternative medicine use among adults: United States, 2002. Adv Data 2004;343:1-19.
[4] Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States, 2007. Natl Health Stat Report 2008;12:1-23.
[5] Kessler RC, Davis RB, Foster DF, et al. Long-term trends in the use of complementary and alternative medical therapies in the United States. Ann Intern Med 2001;135:262-8.
[6] Eisenberg et al. Unconventional medicine.
[7] What is Complementary and Alternative Medicine? National Center for Complementary and Alternative Medicine, 2010. (Accessed August 5, 2010, at http://nccam.nih.gov/health/whatiscam/.)
[8] Chou R, Huffman LH, American Pain Society, American College of Physicians. Nonpharmacologic therapies for acute and chronic low back pain: a review of the evidence for an American Pain Society/American College of Physicians clinical practice guideline. Ann Intern Med 2007;147:492-504.
[9] Chou R, Qaseem A, Snow V, et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med 2007;147:478-91.
[10] Barnes et al. Complementary and alternative medicine use among adults and children.
[11] What is Complementary and Alternative Medicine?
[12] Institute of Medicine of the National Academies. Complementary and Alternative Medicine in the United States. Institute of Medicine of the National Academies Summary Report. Washington, DC: National Academies Press, 2005.
[13] Clinical Trials. National Center for Complementary and Alternative Medicine. (Accessed August 5, 2010, at http://nccam.nih.gov/research/clinicaltrials/.)
[14] Barnes et al. Complementary and alternative medicine use among adults and children.
[15] Eisenberg et al. Unconventional medicine.
[16] Eisenberg et al. Trends in alternative medicine use.
[17] Nahin RL, Barnes PM, Stussman BJ, Bloom B. Costs of complementary and alternative medicine (CAM) and frequency of visits to CAM practitioners: United States, 2007. Natl Health Stat Report 2009;18:1-14.
[18] Nahin et al.

[19] National Health Expenditure Projections 1960-2008. Center for Medicare & Medicaid Services, 2010. (Accessed August 5, 2010, at http://www.cms.gov/NationalHealthExpendData/02_NationalHealthAccountsHistorical.asp.)
[20] Ibid.
[21] Eisenberg et al. Unconventional medicine.
[22] Eisenberg et al. Trends in alternative medicine use.
[23] Tindle HA, Davis RB, Phillips RS, Eisenberg DM. Trends in use of complementary and alternative medicine by US adults: 1997-2002. Altern Ther Health Med 2005;11:42-9.
[24] Pelletier KR, Astin JA. Integration and reimbursement of complementary and alternative medicine by managed care and insurance providers: 2000 update and cohort analysis. Altern Ther Health Med 2002;8:38,9, 42, 44 passim.
[25] Hughes A, Penner M. Reimbursement for complimentary/alternative medicine by California HMOs. Manag Care Q 2001;9:1-4.
[26] Employer Health Benefits 2004 Annual Survey. Menlo Park, CA: Kaiser Family Foundation and Health Research and Educational Trust, 2004;103-109.
[27] Eisenberg et al. Trends in alternative medicine use.
[28] Medicare Coverage Database. Center for Medicare & Medicaid Services, 2010. (Accessed August 5, 2010, at http://www.cms.gov/mcd/overview.asp.)

[29] Pelletier.
[30] Medicare Coverage Database. Center for Medicare & Medicaid Services, 2010. (Accessed August 5, 2010, at http://www.cms.gov/mcd/overview.asp.)
[31] Wolsko PM, Eisenberg DM, Davis RB, Ettner SL, Phillips RS. Insurance coverage, medical conditions, and visits to alternative medicine providers: results of a national survey. Arch Intern Med 2002;162:281-7.
[32] Eisenberg et al. Trends in alternative medicine use.
[33] Nahin et al.
[34] Tindle et al.
[35] Nahin et al.
[36] National Health Expenditure Projections 1960-2008.
[37] Wolsko et al.
[38] What is Complementary and Alternative Medicine?
[39] Institute of Medicine of the National Academies.
[40] About Us. Consortium of Academic Health Centers for Integrative Medicine, 2009. (Accessed August 5, 2010, at http://www.ahc.umn.edu/cahcim/about/home.html.)
[41] Eisenberg et al. Unconventional medicine.
[42] Eisenberg et al. Trends in alternative medicine use.
[43] Eisenberg DM, Cohen MH, Hrbek A, Grayzel J, Van Rompay MI, Cooper RA. Credentialing complementary and alternative medical providers. Ann Intern Med 2002;137:965-73.
[44] Credentialing CAM Providers: Understanding CAM Education, Training, Regulation, and Licensing. National Center for Complementary and Alternative Medicine, 2010. (Accessed August 5, 2010, at http://nccam.nih.gov/health/decisions/credentialing.htm.)
[45] Dietary Supplements. U.S. Food and Drug Administration, 2009. (Accessed August 5, 2010, at http://www.fda.gov/Food/DietarySupplements/default.htm.)
[46] Dietary Supplement Health and Education Act of 1994. U.S. Food and Drug Administration, 1994. (Accessed August 5, 2010, at http://www.fda.gov/RegulatoryInformation/Legislation/FederalFoodDrugandCosmeticActFDCAct/SignificantAmendmentstotheFDCAct/ucm148003.htm.)
[47] Institute of Medicine of the National Academies.
[48] Eisenberg DM. The Institute of Medicine report on complementary and alternative medicine in the United States--personal reflections on its content and implications. Altern Ther Health Med 2005;11:10-5.
[49] Andersson GB. Epidemiological features of chronic low-back pain. Lancet 1999;354:581-5.

[50] Ibid.
[51] Hart LG, Deyo RA, Cherkin DC. Physician office visits for low back pain. Frequency, clinical evaluation, and treatment patterns from a U.S. national survey. Spine (Phila Pa 1976) 1995;20:11-9.
[52] Deyo RA, Mirza SK, Martin BI. Back pain prevalence and visit rates: estimates from U.S. national surveys, 2002. Spine (Phila Pa 1976) 2006;31:2724-7.
[53] Chou et al. Diagnosis and treatment of low back pain.
[54] van Tulder MW, Assendelft WJ, Koes BW, Bouter LM. Spinal radiographic findings and nonspecific low back pain. A systematic review of observational studies. Spine (Phila Pa 1976) 1997;22:427-34.
[55] Stanton TR, Henschke N, Maher CG, Refshauge KM, Latimer J, McAuley JH. After an episode of acute low back pain, recurrence is unpredictable and not as common as previously thought. Spine (Phila Pa 1976) 2008;33:2923-8.
[56] About the Marino Center. Marino Center for Integrative Health, 2008. (Accessed August 5, 2010, at http://www.marinocenter.org/the-marino-way.html.)
[57] Chou et al. Nonpharmacologic therapies for acute and chronic low back pain.
[58] Chou et al. Diagnosis and treatment of low back pain.
[59] Chou et al. Nonpharmacologic therapies for acute and chronic low back pain.
[60] Chou et al. Diagnosis and treatment of low back pain.
[61] Ammendolia C, Furlan AD, Imamura M, Irvin E, van Tulder M. Evidence-informed management of chronic low back pain with needle acupuncture. Spine J 2008;8:160-72.
[62] Berman BM, Langevin HH, Witt CM, Dubner R. Acupuncture for Chronic Low Back Pain. NEJM 2010;363:454-461.
[63] Acupuncture for Pain. National Center for Complementary and Alternative Medicine, 2010. (Accessed August 5, 2010, at http://nccam.nih.gov/health/acupuncture/acupuncture-for-pain.htm.)
[64] Yuan J, Purepong N, Kerr DP, Kovacs FM, Zanoli G. Effectiveness of acupuncture for low back pain. A systematic review. Spine 2008;33:E887-E900. Spine (Phila Pa 1976) 2009;34:752,3; author reply 753.
[65] Rubinstein SM, van Middelkoop M, Kuijpers T, et al. A systematic review on the effectiveness of complementary and alternative medicine for chronic non-specific low-back pain. Eur Spine J 2010;19:1213-28.
[66] Chou et al. Nonpharmacologic therapies for acute and chronic low back pain.
[67] Chou et al. Diagnosis and treatment of low back pain.
[68] Berman et al.