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Alternative Medicine Meets Science

There is no alternative medicine. There is only scientifically proven, evidence-based medicine supported by solid data or unproven medicine, for which scientific evidence is lacking. Whether a therapeutic practice is "Eastern" or "Western," is unconventional or mainstream, or involves mind-body techniques or molecular genetics is largely irrelevant except for historical purposes and cultural interest. We recognize that there are vastly different types of practitioners and proponents of the various forms of alternative medicine and conventional medicine, and that there are vast differences in the skills, capabilities, and beliefs of individuals within them and the nature of their actual practices. Moreover, the economic and political forces in these fields are large and increasingly complex and have the capability for being highly contentious. Nonetheless, as believers in science and evidence, we must focus on fundamental issues—namely, the patient, the target disease or condition, the proposed or practiced treatment, and the need for convincing data on safety and therapeutic efficacy.

Despite the increasing use of alternative medicine (also termed *complementary*, *integrative*, or *unconventional* medicine) in the United States and throughout the world, most alternative therapies have not been evaluated using rigorously conducted scientific tests of efficacy based on accepted rules of evidence. The lack of properly designed and conducted randomized controlled trials is a major deficiency. For some published studies, serious concerns have been raised regarding methodological quality. A National Institutes of Health expert panel concluded that current evidence is inadequate for development of practice guidelines for alternative therapies, largely because of lack of relevant outcomes data from high-quality clinical trials.[1] However, some advocates of alternative medicine argue that many alternative therapies cannot be subjected to the standard scientific method and thus, instead must rely on anecdotes, beliefs, theories, testimonials, and opinions to support effectiveness and justify continued use.

Regardless of the origin or type of therapy, the theoretical underpinnings of its mechanism of action, or the practitioner who delivers it, the critical questions are the same. What is the therapy? What is the disease or condition for which it is being used? What is its purported benefit to the patient? What are the risks? How much does it cost? And, perhaps most important, does it work? For virtually all medical therapies and interventions, whether conventional or alternative, determination of effectiveness and recommendations for clinical application should be based on the strength of the scientific evidence using explicit criteria for grading the quality of evidence[2,3] (Table) and ratings for technology assessment[4] (ie, "established," "promising," "investigational," "doubtful," or "unacceptable.")

While acknowledging that many therapies used in conventional medical practice also have not been as rigorously evaluated as they should be, we agree that most alternative medicine has not been scientifically tested.[5] However, for alternative medicine therapies that are used by millions of patients every day and that generate billions of dollars in health care expenditures each year, the lack of convincing and compelling evidence on efficacy, safety, and outcomes is unacceptable and deeply troubling. We believe that physicians should become more knowledgeable about alternative medicine and increase their understanding of the possible benefits and limitations of alternative therapies. By doing so, physicians will be able to serve as more useful sources of information for their patients and advise them appropriately. As with conventional therapies, advice should be based on data and scientific information rather than anecdotal information, misperceptions, or preconceived or unfounded notions about effectiveness or lack thereof.

This theme issue of *JAMA* and the annual coordinated theme issues of the 9 American Medical Association *Archives* Journals published this month on alternative medicine represent a planned, concerted effort by the editors of these scientific journals to address some of these issues by providing physicians and other health care professionals with clinically relevant, reliable, fresh scientific information on alternative therapies. In response to our call for papers on alternative medicine,[6] we received more than 200 manuscript submissions to *JAMA* and many more manuscripts were received by the *Archives* Journals. The result, after our usual rigorous review process, is publication of more than 80 articles and editorials on alternative medicine in our 10 scientific journals, including 18 randomized trials and systematic reviews, on more than 30 different topics, and from more than 16 different countries.

This issue of THE JOURNAL includes 6 randomized clinical trials that evaluate the use of 6 diverse alternative medicine therapies for treatment of common clinical conditions. The results are intriguing. Bove and Nilsson[7] report that chiropractic spinal manipulation is not effective for episodic tension headache. Cardini and Weixin[8] found that moxibustion (stimulation of an acupuncture point by heat generated from burning a specific herb) is helpful for correction of breech presentation in late pregnancy. Bensoussan and colleagues[9] document that a Chinese herbal medicine formulation improves symptoms of irritable bowel syndrome. Shlay and coinvestigators[10] demonstrate that acupuncture is no more effective than amitriptyline or placebo for relieving pain due to human immunodeficiency virus–related peripheral neuropathy. Heymsfield and coworkers[11] determined that *Garcinia cambogia*, a common component of commercial weight-loss products, lacks efficacy as an

Categories for Rating Quality of Scientific Evidence for Effectiveness of an Intervention*

Quality of Evidence	
I.	Evidence obtained from at least 1 properly randomized controlled trial
II-1.	Evidence obtained from well-designed controlled trials without randomization
II-2.	Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than 1 center or research group
II-3.	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.
III.	Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

*Information is from Lawrence et al.[2]

Dr Fontanarosa is Senior Editor, *JAMA*, and Dr Lundberg is Editor, *JAMA*.
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antiobesity agent. In a preliminary study, Garfinkel and coworkers[12] report that a yoga-based intervention appears to hold promise for relieving some symptoms of carpal tunnel syndrome. In addition, a systematic review by Wilt and colleagues[13] suggests that saw palmetto extracts improve urologic symptoms in patients with benign prostatic hyperplasia.

Perhaps just as important as the results of their studies, these investigators demonstrate that alternative medicine therapies and interventions can and should be evaluated using explicit, focused research questions[14] along with established and accepted rigorous research methods[15] (eg, appropriate controls, effective blinding procedures, adequate power, state-of-the-art techniques for systematic reviews); incorporating measurable, objectively assessed end points (eg, blinded assessment); and reporting meaningful patient-centered outcomes.

Two other studies in this issue provide additional new information on alternative medicine. In a replication of their previous nationally representative survey,[16] Eisenberg et al[17] report that the prevalence of use of at least 1 of 16 specific alternative therapies during the previous 12 months has increased significantly (from 33.8% in 1990 to 42.1% in 1997), that the estimated number of visits to alternative medicine practitioners increased dramatically (from 427 million in 1990 to 629 million in 1997), and that only 38.5% of those who used alternative therapies discussed them with their physician. Total out-of-pocket expenditures associated with use of alternative medicine in 1997 were estimated at $27 billion. In an analysis of data from malpractice insurers from 1990 through 1996, Studdert and colleagues[18] found that claims against chiropractors, massage therapists, and acupuncturists generally occurred less frequently and usually involved less severe injury than claims against medical doctors. The authors also summarize the legal issues and principles for physicians to consider when advising or contemplating referral of patients to alternative medicine practitioners.

Taken together, the articles published in this issue of THE JOURNAL and in the *Archives* Journals' theme issues on alternative medicine add a substantial amount of new information and scientific data on alternative therapies to the peer-reviewed mainstream medical literature. However, given the burgeoning use of alternative medicine therapies, the increasing numbers of patients who consult both medical doctors and alternative medicine practitioners, and the increasing number of insurance companies and managed care organizations offering programs and benefits for alternative medicine,[19] the need for additional, carefully conducted, high-quality research is essential.

Priority for research funding for alternative medicine should be given to investigations of relevant clinical problems for which well-designed studies have shown encouraging results for alternative therapies, especially for conditions that are common and those for which conventional medicine has not been effective. Attention should be given to evaluation of safety and efficacy, but also to examining the effectiveness of a treatment strategy, with consideration of community practice settings, patient expectations and compliance, and cost-effectiveness.[20] Collaborative research, especially among the federally funded centers for alternative medicine research in the US and with international alternative medicine research centers, may improve efficiency in answering important research questions. We encourage high-quality, rigorous research on alternative medicine and invite authors to submit their best papers for our objective evaluation and consideration for publication.

However, until solid evidence is available that demonstrates the safety, efficacy, and effectiveness of specific alternative medicine interventions, uncritical acceptance of untested and unproven alternative medicine therapies must stop. Alternative therapies that have been shown to be of no benefit (aside from possible placebo effect) or that cause harm should be abandoned immediately. Physicians, insurance plans, medical centers and hospitals, managed care organizations, and government policymakers should base decisions regarding incorporation of and payment for alternative medicine therapies on evidence-based research and objective cost-effectiveness analyses[19] rather than on consumer interest, market demand or competition, well-publicized anecdotal reports, or political pressures from well-organized and influential interest groups.

Ultimately, answering fundamental questions about efficacy, safety, appropriate clinical applications, and meaningful outcomes for all medical therapies, including those considered alternative medicine, requires critical and objective assessment using accepted principles of scientific investigation and rigorous standards for evaluation of scientific evidence. For patients, for physicians and other health care professionals, and for alternative medicine practitioners—indeed, for all who share the goal of improving the health of individuals and of the public—there can be no alternative.

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