

Consider the Alternatives: Perspectives on Complementary and Alternative Medicine

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On many issues, the American medical profession and the United States government do not see eye to eye. One subject that both have agreed to take seriously is the growing importance of alternative medicine in our culture.

Alternative medicine can be defined as a diverse group of healthcare systems, techniques, and products that are not currently part of conventional Western medicine as practiced by holders of medical degrees (M.D. or D.O.) and by their colleagues in the allied health professions. (Some physicians, particularly primary care physicians, have incorporated alternative methods such as acupuncture and hypnosis into their practices.) Recent surveys show that a large segment of the general public makes use of alternative medicine at least occasionally, and that a major slice of Americans' healthcare spending goes to alternative practitioners, including distributors of health foods and herbal medicines.

Although the benefits of many alternative therapies remain in doubt, their capacity to do harm is only too obvious. Practices such as herbal medicine and megavitamin therapy can interact adversely with more orthodox forms of treatment. Some herbal products and other unconventional modes of treatment (coffee enemas, acupuncture with unsterile needles) can be lethal. Any alternative therapy may be harmful if it prevents a patient from receiving appropriate diagnosis and treatment.

Some alternative practitioners are overtly hostile to scientific medicine, make a practice of condemning physicians and hospitals for incompetence and dishonesty, and try to dissuade their clients from consulting legitimate healthcare providers. Often they claim that there is a conspiracy among health professionals to suppress alternative methods of healing or disease prevention so as to stifle competition and to make sure the public stays sick enough to require their continuing services.

In 1992 Congress established the Office of Alternative Medicine (OAM) within the Office of the Director, National Institutes of Health (NIH), to promote the scientific evaluation of alternative therapies and support training in fields not typically included in the curriculum of mainstream medical education.

In 1998 OAM was renamed the National Center for Complementary and Alternative Medicine (NCCAM). Whereas alternative medicine refers to a method or practice that is used instead of more conventional measures, complementary medicine implies something that augments or enhances the effectiveness of standard therapy when used along with it. This somewhat artificial distinction was evidently contrived as a sop

to advocates of unconventional health practices who perceived *alternative* as a pejorative term. Apparently no one has thought of substituting a more appropriate word for *medicine* in these phrases, which by definition refer to theories and practices outside the field of modern scientific medicine.

Alternative medicine is also often referred to as *holistic medicine*. Such usage stretches the meaning of that term beyond its primary sense (discussed below). Yet another term often used is *integrative medicine*. This too can be ambiguous. (Both Greek *holos* and Latin *integer* mean 'whole' in the sense of 'sound, intact', but both can also imply breadth of vision or ecumenism.) For the sake of simplicity, I will use the abbreviation *CAM* throughout this article to refer to complementary and/or alternative medicine practices.

The most recent statistics available on the use of CAM in the U.S. were released in May 2004 by NCCAM and the National Center for Health Statistics, a branch of the Centers for Disease Control and Prevention. These data were derived from a survey completed during 2002 by more than 30,000 adults in this country. Of those questioned, 36% reported using some form of CAM during the preceding year. When megavitamin therapy and prayer offered specifically for health reasons are included in the definition of CAM, the number rises to 62%. In fact, prayer for health reasons was the most commonly used CAM therapy.

The economics of CAM in the U.S. involves some staggering numbers. The survey quoted above did not include questions about healthcare spending, but the report included figures from national surveys conducted in 1997. In that year, the public spent between \$36 billion and \$47 billion on CAM therapies. Of that amount, between \$12 billion and \$20 billion was paid out of pocket—that is, not by insurance, HMO, or governmental third parties—for the services of CAM practitioners. (Many insurance plans do provide coverage for certain alternative therapies, such as acupuncture, biofeedback, and massage therapy.) Most people who use CAM use it to treat themselves; only about 12% of the survey respondents sought care from CAM practitioners.

Most definitions of CAM are negative in form or intent: methods of treatment not taught in medical schools; systems of healing offered by unlicensed practitioners; health systems not in accord with Western scientific medicine; health care not covered by insurance; therapy unavailable in U.S. hospitals.

Currently CAM encompasses a motley assortment of hygienic, diagnostic, and therapeutic ideologies and methods with just one thing in common: they have thus far failed to gain acceptance as part of mainstream scientific medicine because they lack both a valid scientific basis and adequately documented evidence of clinical efficacy. (Scientific medicine employs many methods that theoretically ought to work but usually don't, and many others that work even though nobody knows why.)

Some forms of alternative medicine differ from traditional medicine only in preferring natural or hygienic methods to drug treatment and surgery, and many share a holistic view of human health, emphasizing integration of body, mind, and spirit. But many alternative health systems are based on false or inconsistent ideas about human anatomy, physiology, pathology, and pharmacology, or are rooted in ancient or modern philosophical or religious systems. Still others are simply criminal impostures designed to exploit unsophisticated healthcare consumers and those whose needs scientific medicine has failed to meet.

A classification used in the report of the 2004 survey breaks down CAM into five domains:

1. Biologically based practices use substances found in nature, such as herbs, vitamins in high dosage, and special diets.

2. Energy medicine is based on the belief that fields of energy surround and penetrate the human body.

3. Manipulative and body-based practices involve posture, touch, massage, and other manipulations of one or more parts of the body.

4. Mind-body medicine endeavors, by a variety of techniques, to enhance and fine-tune the resonance between the mind and bodily function and well-being.

5. Whole medical systems are built upon complete systems of theory and practice.

This is by no means a perfect taxonomy of CAM, in that some practices fit into more than one domain, while others don't seem to fit into any of them.

Who uses alternative medicine? According to the study conducted in 1997 and published in 1998, people who resort to alternative therapies tend to be in poorer general health than others and to suffer from certain chronic conditions, including anxiety, depression, headache, and backache. They also tend to be more highly educated, more sensitive to the role of mental and spiritual influences on health, and more likely to adopt unorthodox philosophical systems. Dissatisfaction with conventional medicine seems to play less of a role in their choice than a preference for a healing system that is congruent with their personal beliefs and values.

The 2004 survey found that CAM is used by more women than men and is more likely to be used by people who have been hospitalized in the past year and by former smokers, as compared with current smokers or those who have never smoked. According to the survey, CAM is most often used to treat or prevent chronic or recurring pain involving the back, neck, head, or joints. Other frequent indications are colds, anxiety or depression, gastrointestinal disorders, and sleep problems.

People who have no health insurance because they are unemployed, or because they can't afford it, also can't afford full-scale medical treatment when they need it. Alternative therapies typically cost less than standard ones.

The increasing availability of alternative therapies in the U.S., the appeal of alternative medicine to the general public, and the growing interest of government agencies and clinical researchers in exploring its possibilities can be traced to numerous factors. Here are some of the more cogent and obvious ones.

1. "A drowning man clutches at a straw." Our country is full of miserable, maladjusted people whom the legitimate medical establishment has failed utterly to help. In desperation even a skeptic will reach for an unconventional solution to a problem.

2. "There's a sucker born every minute." A large segment of the population is unequipped by nature, education, or experience to analyze critically the claims of health practitioners, including legitimate ones. Uneducated and unsophisticated persons are vulnerable to exploitation by con artists in every walk of life, including healthcare.

3. "*Omne ignotum pro magnifico.*" Anything surrounded by an air of mystery tends to be held in awe. Proponents of sham therapies exploit this fundamental human weakness by burying their senseless rituals in a cloud of pseudoscientific mumbo-jumbo.

4. "Buddy, can you spare a million?" The costs of traditional scientific medicine are skyrocketing. People who have no health insurance because they are unemployed, or because they can't afford it, also can't afford full-scale medical treatment when they need it. Alternative therapies typically cost less than standard ones.

5. "Hands on." Long before there was a medical profession, primitive human beings must have discovered that touch, massage, and TLC have a beneficial effect on the course and outcome of many illnesses and injuries. Touch and manipulation have been part of medical practice since its beginnings. Physicians' hands were once their most important diagnostic and therapeutic tools. Today many medical and health practitioners tend to retreat from physical contact with the patient, distanced by high-tech gadgetry, the involvement of technicians and subspecialists, legal and time constraints, and a disinclination to become personally involved. In contrast, expressions of personal warmth and care for the patient, and physical contact with the practitioner, are features of many alternative practices.

6. "Let's find what's wrong with you and fix it." Traditional medicine is disease-oriented. In contrast, many alternative health systems appeal to patients by being proactive, positive, constructive, energy-oriented: "Live life to the fullest." "Realize your potentials." "A sound mind in a sound body." "Get into harmony with nature."

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7. "The operation was a success but the patient died." Prescription medicines often cause severe side effects, and surgery may have an unsatisfactory or fatal outcome. In contrast, most alternative therapies are relatively innocuous, provided that they don't prevent the patient from receiving appropriate or standard therapy for serious illness.

8. "Certified quacks." Legislation imposing restrictions on fringe practitioners, establishing measures for their surveillance and control, and exacting licensure fees from them has often been perceived by the public as a stamp of legitimacy.

9. "If you can't beat them, join them." Many physicians and clinics have added alternative practices to their repertoire for the same reason that hamburger chains start selling fried chicken, and fried chicken chains start selling pizza: they can increase revenues and beat the competition by diversifying.

A crucial concept in 21st-century medical theory and practice is that of evidence-based medicine, which has been defined as the conscientious, explicit, and judicious use of the best available evidence in making decisions about the care of the individual patient. A major ingredient in such decision-making is the review of outcomes of clinical research as reported in the medical literature. Federally sponsored research on alternative therapies can be expected to supply a wealth of valuable documentation, positive or negative, and provide grounds for rational decisions by both sophisticated patients and conscientious physicians.

Here are capsule reviews of more than 20 types of alternative medicine, any one of which you may hear about in the next dictation you transcribe. Not all of the methods and systems described below have been taken seriously enough by NCCAM to become the subject of clinical trials. (One hopes that taxpayers' money is not being wasted on assessments of Christian Science and homeopathy, which are in effect denials of disease and treatment, respectively, or of nonsense like iridology and rolfing.)

acupuncture A family of therapeutic techniques involving manipulation of fine, solid, metallic needles inserted into specific points on the skin surface. In a broader sense, acupuncture includes application of heat, pressure, magnetism, electricity, or lasers at the same points. Acupuncture has been a component of Chinese traditional medicine for more than 2500 years. Its theoretical basis is that vital energy (called qi or chi) runs in fixed channels or meridians through the body and over its surface. These meridians are like rivers flowing through the body to irrigate and nourish the tissues. An obstruction in the movement of these energy rivers is like a dam that backs up the flow

in one part of the body and restricts it in others; such an obstruction can lead to disease. Acupuncture needles supposedly restore health by unblocking these obstructions and reestablishing the regular flow through the meridians. The Standard International Acupuncture Nomenclature proposed by the World Health Organization includes more than 400 acupuncture points and 20 meridians.

Despite the difficulty of conducting clinical trials in which control subjects receive only sham acupuncture, there is clear evidence that needle acupuncture effectively reduces adult postoperative and chemotherapy nausea and vomiting, dysmenorrhea, postoperative dental pain, and some other kinds of pain. Animal and human experimentation has shown that acupuncture elicits both local and systemic neural and hormonal responses. The analgesic effect of acupuncture may be due to the release of opioid peptides (endorphins); this analgesia can be blocked by administration of the opioid antagonist naloxone.

Neither the meridian system nor the concept of qi can be reconciled with our current knowledge of anatomy, physiology, and pathology. Moreover, practitioners of different systems of acupuncture disagree on the location and use of acupuncture points. Many of the therapeutic effects of acupuncture can be achieved by applying stimuli other than needle puncture; these include lasers, heat, and mechanical and electrical stimulation. Acupressure is a variant in which manual pressure is applied at acupuncture points instead of needles being inserted. The term capitalizes on the interest in and popularity of acupuncture but involves a contradiction, since Latin *acu* means 'with a needle'.

A majority of states provide licensure or registration for practitioners of acupuncture. It has been reported that more than 1 million Americans receive acupuncture treatments yearly. The U.S. Food and Drug Administration regulates the manufacture and use of acupuncture needles as it does other medical and surgical devices. Needles are used once and discarded.

aromatherapy The use of aromatic oils extracted from plants for therapeutic purposes. Essential oils are obtained from plant sources (flower, leaf, resin, bark, root, twig, seed, berry, rind, and rhizome) by steam distillation, infusion, or extraction with an inert or carrier oil such as grapeseed, jojoba, or sweet almond oil. They are used therapeutically in various ways: in cosmetics (facial, skin, body, and hair care products), in massage lotions, by direct inhalation, and by use of a diffuser or candle that disperses scents into the atmosphere.

The ancient Egyptians used aromatic plants in preparing massage oils, medicines, embalming preparations, skin care products, and perfumes. Plant aromatics were also used in India as part of the practice of ayurveda. Oils from chamomile, geranium, lavender, marigold, patchouli, peppermint, tea tree, rosemary, sage, sweet marjoram, and many other plants are in current favor. Aromatic essential oils can be purchased by mail order and from many health food outlets and pharmacies.

Aromatherapy is seen by most of its advocates as a complement to, not a replacement for, medical treatment. Pleasurable scents can unlock memories, trigger positive emotions, and relieve stress. Aromatherapy is a widely accepted and generally innocuous form of alternative medicine. A few oils

(lemon, bergamot, angelica) sensitize the skin to ultraviolet light and may induce dermatitis after sun exposure.

art therapy A form of psychotherapy that uses both psychological theory and the creative process to help clients overcome mental and emotional disorders. Art therapy works with the human ability to create images in the mind and to translate these images outward with the help of materials such as crayons, chalk, paint, modeling clay, and computers. Using art in therapy can both reconcile emotional conflicts and foster self-awareness and personal growth through the creative process. In addition to its use in treatment, art therapy is a means of assessment and evaluation of individuals, families, and groups.

Art therapy combines traditional verbal therapy with non-verbal communication through art work. It allows for the reflection of dream, fantasy, and memory images in visual form, helps clients identify and express negative feelings that are too difficult to talk about, and can increase self-esteem and confidence. The art work also offers a permanent visual record for the client and therapist. It remains constant through time and is not subject to the distortions of memory. It acts as a direct statement by the client, avoiding the filtering of information by others.

Art therapists provide individual, group, and family therapy. They work in a wide variety of settings, including hospitals, schools, social service agencies, shelters, prisons, substance abuse treatment centers, and psychiatric care facilities, as well as in private practice. A professional art therapist must have a master's degree in counseling, including specialized training in art therapy, and must serve a supervised clinical internship. To receive certification by the American Art Therapy Association (AATA), therapists must satisfy basic requirements and pass an examination.

ayurveda (Sanskrit *ayu* 'life' + *veda* 'knowledge') One of the oldest complete medical systems in the world, an intricate program of healing that originated in India thousands of years ago. Its aim is to maintain or restore health by enabling one to understand one's own constitution and modify one's diet and lifestyle accordingly. Ayurveda emphasizes the mind-body relationship, and also postulates the existence within nature and the human body of forces or types of energy called tridoshas.

The basic theory of ayurveda is similar to the humoral doctrines of Hippocrates and Galen, and just as simplistic, naïve, and irreconcilable with modern science. Each individual is viewed as a unique blend of five elements (earth, air, fire, water, and ether or empty space). Imbalances in the constitution caused by faulty diet, weather changes, lack of exercise, failure to live in harmony with nature, and other factors can induce illness.

Corrective action depends on the individual's constitution and hence varies from person to person. Practitioners of ayurveda generally recommend lifestyle changes, diet, nutritional supplements, massage, meditation, and other measures to treat illness.

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biofeedback A therapeutic technique in which signals from the subject's own body are used to improve health or enhance performance. The term was coined in the 1960s to denote procedures in which subjects learned to alter or control blood pressure, pulse rate, muscle tension, and other functions that can be monitored physically or electronically. Subjects can use hand-held devices that flash or beep when blood pressure or pulse rate exceeds a certain limit.

Biofeedback has produced modest improvement in certain conditions, particularly those involving the autonomic nervous system or having a strong psychosomatic component, such as migraine and tension headache, urge incontinence, premenstrual syndrome, attention-deficit disorder, and panic attacks. Claims that subjects can control mental function through electroencephalographic monitoring (EEG neurofeedback) have not been substantiated.

biofield therapy A therapeutic laying on of hands with roots in ancient Chinese medicine. The theoretical basis is that a field of physical energy or life force—the biofield—permeates and surrounds the body, and that the practitioner can direct, modify, or amplify this field by touch. The healing force is believed to come from a source other than the practitioner—God, the cosmos, or some other undefined supernatural entity.

During biofield treatment, the practitioner places hands directly on or near the patient's body to improve general health or treat a specific dysfunction. Treatment sessions may take from 20 minutes to an hour or more; a series of sessions is often needed to treat some disorders. About 50,000 practitioners provide 18 million sessions annually in the United States.

chelation therapy Intravenous administration of ethylenediamine tetraacetic acid (EDTA) for the prevention and treatment of atherosclerosis. This agent, which binds metals chemically and facilitates their renal excretion, has been used for decades in the treatment of lead and other heavy metal poisoning. Norman E. Clarke, Sr., who developed the technique in the 1950s, observed that some patients treated for lead poisoning also seemed to show improvement in cardiovascular health, and speculated that binding and removal of calcium from atherosclerotic plaques by EDTA was responsible for the improvement.

On his recommendation and those of others, chelation therapy has been used for many years by some physicians to treat coronary artery disease, intermittent claudication, and other

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clinical syndromes due to atherosclerosis. Many patients have opted for chelation therapy rather than undergo bypass surgery or angioplasty. Although a course of treatment may cost several thousand dollars (not covered by Medicare or most other insurance plans), it is much less expensive than surgery.

The American Heart Association, after reviewing the available literature on the use of chelation in treating arteriosclerotic heart disease, has concluded that there have been no adequately controlled scientific studies using currently approved methodology to support this therapy. The United States Food and Drug Administration (FDA), the National Institutes of Health (NIH), and the American College of Cardiology concur. A recent study of chelation therapy, using rigorous methodology, determined that EDTA chelation therapy was no more effective than placebo in intermittent claudication due to peripheral vascular disease of the lower extremity.

Cardiovascular disease authorities point out that calcium is just one component of an atherosclerotic plaque. Atherosclerosis is a complex process involving cholesterol and other lipids, fibrous tissue, and calcium. Removal of calcium alone probably cannot relieve vascular occlusion. Moreover, using this form of unproven treatment may deprive patients of the well-established benefits of other methods of treatment.

chiropractic A method of healing employing spinal manipulation and other mechanical techniques, and based on the notion that the principal cause of human disease is misalignment of vertebrae with compression of nerves. Chiropractic was founded in 1895 by Daniel D. Palmer, a grocer of Davenport, Iowa, after he allegedly cured a longstanding case of deafness by manipulating the patient's neck. (It is perhaps unnecessary to observe here that no part of the vestibulocochlear nerve lies outside the skull.)

Palmer probably borrowed his theories and practices wholesale from Andrew Taylor Still, who founded osteopathy around 1874. While osteopathy has now repudiated its nonscientific origins and undergone a gradual rapprochement with medicine, chiropractic still clings to its invalid theoretical basis. In the early decades of this century, state legislatures were persuaded to license chiropractors in order to maintain surveillance and control of their activities. But the result of licensure was to lend an air of legitimacy to a groundless and fraudulent system of healing.

In 1993 more than 45,000 licensed chiropractors were practicing in the United States. Chiropractic "physicians" use manipulation but not drug therapy or surgery. Manual healing methods are based on the notion, common to many forms of

quackery including iridology and reflexology, that dysfunction of one part of the body often affects secondarily the function of other discreet, not necessarily directly connected, body parts. Chiropractic "medicine" claims to restore and preserve health and correct dysfunctions by manipulating soft tissues or realigning body parts. The emphasis in diagnosis and treatment is on spinal misalignment allegedly causing disease and requiring adjustment. The diagnosis of spinal misalignment is often based on a trifling disparity of leg lengths or on narrowed intervertebral spaces supposedly visible on a single posteroanterior radiograph of the entire spine.

Chiropractic treatment that includes standard physical therapy modalities (heat, cold, massage, active and passive exercise, diathermy) can provide relief of some musculoskeletal pain problems. But in their aggressive marketing strategies, their adherence to the concept of spinal "adjustment," and their involvement in many other dubious forms of diagnosis and therapy, the majority of chiropractors remain outside the realm of legitimate, evidence-based healing. Chiropractors who cause the death of their patients are not sued for malpractice but tried for and convicted of manslaughter.

For decades, organized medicine endeavored to suppress chiropractic as a threat to the public welfare. Educational efforts were undertaken to awaken the public to the danger of using chiropractic manipulation for diabetes mellitus, cancer, and infectious diseases. Collaboration of physicians in the training and practice of chiropractors was pronounced unethical. But as a consequence of powerful lobbying by chiropractors for enhanced legal status and broadened scope of practice, and court actions against the medical profession for "restraint of trade," organized American medicine has given up the struggle.

Christian Science The Christian Science Church was founded in 1879 by Mary Baker Eddy as a sect of Christianity based on Mrs. Eddy's interpretation of the Bible. Adherents of this religion are taught that disease, as well as the pain and other symptoms it causes, is an illusion, and can be cured only through heartfelt, disciplined prayer. Christian Science rejects not only medical and surgical treatment but even home remedies such as ice packs and massage.

The course of training for a Christian Science practitioner lasts two weeks. Practitioners are not licensed in any state and need not meet any legal standards. They often render prayer treatment by telephone without even seeing their patients. However, not only do they bill their patients like physicians and other legitimate health practitioners, but the U.S. Internal Revenue Service allows such bills to be deducted as medical expenses on income tax returns, and Medicare, Medicaid, and private and governmental insurance programs pay for such services.

Despite the claims of Christian Scientists that persons diagnosed with cancer, diabetes mellitus, and numerous other life-threatening disorders have been healed by the type of prayer advocated by the church, no scientific evidence supports such healing powers. Adherents of Christian Science who have withheld necessary medical treatment from their children with seri-

ous or fatal consequences have on several occasions been convicted of criminal negligence.

hair analysis A diagnostic procedure based on quantitative analysis of the mineral content of a sample of hair, usually taken from the back of the subject's neck. Proponents of hair analysis claim that it is useful for evaluating the subject's general state of nutrition and health and in detecting predisposition to disease. They also claim that hair analysis can determine whether mineral deficiency, mineral imbalance, or heavy metal pollutants in the body may be the cause of symptoms. Laboratory reports typically contain lengthy computer-generated interpretations, often including diagnoses of several potentially serious diseases, and generally recommending supplements of vitamins, minerals, nonessential food substances, enzymes, and extracts of animal organs to correct deficiencies.

Although hair analysis has limited value as a screening device for chronic heavy metal exposure, the consensus of legitimate medical authorities is that it is of no use in evaluating nutritional status or general health. Being nonliving, hair is perhaps the least sensitive indicator in the body of current biochemical status and equilibrium. Normal ranges of mineral concentrations in hair have not been defined. For most elements, no correlation has been established between hair level and other known indicators of nutrition status. Commercial hair analysis laboratories are not subject to independent proficiency testing or supervision or to compliance with reference standards. Hair mineral content can be affected by exposure to various substances such as shampoos, bleaches, and hair dyes, and no available technique can distinguish between bodily and environmental sources of mineral content. The level of certain minerals can be affected by the color, diameter, and rate of growth of an individual's hair, the season of the year, the geographic location, and the age and gender of the individual.

During the 1980s, several hair analysis laboratories were shut down by legal authorities and their operators prosecuted for health fraud or practicing medicine without a license. Hair analysis is still being used by chiropractors, "nutritional consultants," physicians who perform chelation therapy, and other dubious practitioners, who claim that hair analyses can help them diagnose a wide variety of diseases and can be used as the basis for prescribing supplements.

herbal medicine Use of various parts of plants to treat symptoms and promote health. Drugs of vegetable origin have been used in medicine for thousands of years, but many herbs that have long been recognized as effective have now been replaced by safer and more predictable synthetic compounds. The continuing popularity of herbal remedies with unlicensed and irregular practitioners as well as with the self-medicating public arises in part from their anomalous legal status.

The Dietary Supplement Health and Education Act of 1994 (DSHEA) classified vitamins, minerals, amino acids, enzymes, botanicals (herbal medicines), and certain components or derivatives of animal foods (organ and glandular tissues) as dietary supplements. This federal law exempts these drug entities, often called nutraceuticals, from the safety and efficacy requirements

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and regulations that manufacturers and marketers of prescription and over-the-counter drugs must observe (e.g., preclinical animal studies, premarketing controlled clinical trials, postmarketing surveillance).

DSHEA allows product labeling to list nutritional benefits without preauthorization by FDA. A label can even make health claims ("may promote regularity," "helps maintain cardiovascular health") provided that it also bears a disclaimer stating that the product is not sold for the prevention, diagnosis, treatment, or cure of any disease. For many nutraceuticals, virtually no experimental data are available on efficacy, side effects, or drug interactions. Because an herbal remedy cannot be patented, a pharmaceutical manufacturer has little incentive to conduct research on its properties, beneficial or harmful.

Before the FDA can remove a nutraceutical from the market, it must show that the substance is unsafe. But because federal legislation has established no regular procedure for observing or reporting adverse events such as hypersensitivity, hepatic or renal toxicity, bone marrow suppression, fetal damage, or drug interactions, nutraceuticals are largely immune to federal ban.

No federal agency supervises or controls the potency or purity of herbal products. Random studies suggest that these products vary widely in potency (sometimes containing none at all of the labeled ingredient) and may often be adulterated with other agents or contaminated with pesticides. About one-third of the U.S. population uses herbal remedies at least occasionally, but more than 50% of these fail to disclose that fact during routine medical history-taking (e.g., before surgery). Among the more popular herbals are echinacea, ginseng, ginkgo, garlic, kava, St. John's wort, peppermint, valerian, and soy supplements.

holistic medicine A broad and imprecise term encompassing various theories and methods of healing that seek to integrate psychological, spiritual, and social elements of the causation, prevention, and treatment of disease with the more traditional and widely accepted biological elements of Western medicine. Systems and practitioners that identify themselves as holistic typically consider the "whole" patient and focus on prevention and wellness. Sometimes they seek to promote self-actualization, enlightenment, or attainment of a state of high-level healthiness in the manner of some Eastern religions.

But the term *holistic* (sometimes misspelled *wholistic*) medicine is often used synonymously with alternative or integrative medicine, particularly by physicians who have chosen to incor-

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porate alternative methods such as acupuncture and hypnosis into their practices.

homeopathy (Greek *homoios* ‘similar, like’ + *patheia* ‘disease, suffering’) A healing method invented by Samuel Hahnemann (1755-1843), a German physician who taught that *similia similibus curantur*—“likes are cured by likes.” The basis of his theory was the observation that drugs given in excessive dosage sometimes reproduce or aggravate the very symptoms that, when given in standard dosage, they suppress. From this Hahnemann inferred that medicinal agents administered in minute quantities could somehow trigger a healing response and counter the symptoms (nausea, tachycardia, diarrhea) that larger doses of the same agents induced. Moreover, he declared that the smaller the dose, the more effective the agent would be in stimulating the natural healing forces of the body. Standard homeopathic preparations contain plant, animal, or mineral substances in such infinitesimally small concentrations—sometimes in a dilution of 1:10²⁴—that they cannot be detected by chemical analysis.

Hahnemann also recommended exercise, a nourishing diet, and fresh air. In the early 19th century his doctrines, particularly his use of drugs with no side effects, appealed to many members of both the public and the medical profession, who were dissatisfied with the drastic and largely ineffectual methods of “scientific” medicine, which included bloodletting with lancet or leeches, blistering, and induction of violent vomiting and purging.

Schools of homeopathy survived into the 1920s, when reforms in medical education, and a widespread realization that the theoretical basis of homeopathic pharmacology is irrational, led to their collapse. Homeopathic remedies are still sold by mail-order houses and health food stores and are dispensed by some alternative practitioners.

hypnotherapy The use of hypnosis in various clinical applications, including pain control in minor surgery and dentistry, breaking unwanted habits (smoking, overeating), relief of psychiatric disorders (insomnia, anxiety, phobias), and symptomatic improvement in certain illnesses that are induced or aggravated by psychosomatic factors (asthma, migraine, sexual dysfunction).

Hypnosis is a natural trancelike state of altered consciousness, somewhat like daydreaming, that lies between sleeping and waking. Most of us fall into such a state at least occasionally. It is estimated that about 85% of the population can be deliberately placed in such a state by a professional hypnotist, and most people can be trained to induce the state in themselves. A person in a hypnotic trance displays alterations in perception, attention, and memory, and heightened responsiveness to suggestions and commands.

What we now call hypnosis has been offered as an explanation of many paranormal phenomena recorded in the Bible and secular history. It may be the basis of some forms of healing, including that practiced by the Asclepiads in the “sleep temples” of ancient Greece and some apparently miraculous cures associated with religious shrines or faith healers in modern times.

In the 18th century Franz Anton Mesmer discovered that he could induce a trancelike state in some persons, and concluded that he possessed a special power or gift, which he termed “animal magnetism.” Although he was a charlatan at heart and his theories were preposterous, Mesmer drew the attention of impartial scientific observers to the phenomenon renamed “hypnosis” in the 19th century by James Braid. The observations of Sigmund Freud on hypnosis in hysteria and other psychiatric disorders were of seminal importance in his development of psychoanalysis.

But for many decades hypnosis was the almost exclusive province of stage entertainers, who brought the technique into disrepute. Only during the latter half of the 20th century has hypnosis been seriously studied and introduced as an adjunct to scientific medicine. In hypnotherapy, the trance state can be used to induce physical relaxation and emotional tranquillity, distract the subject from unwanted perceptions (pain, anxiety), and reprogram harmful patterns of response or behavior. It has also been claimed to improve self-confidence, memory, concentration, and performance in work or sports.

In treating psychiatric problems, the hypnotherapist can help the client recall and reinterpret suppressed memories. However, hypnotherapy is just a part of such treatment, which also includes cognitive (insight-oriented) and behavioral techniques.

iridology A diagnostic method that claims to identify acute and chronic illness by studying the color, texture, and brightness of the iris, as set forth in detail by charts. This pseudoscience was founded during the latter part of the 19th century in Europe by Ignatz von Peczely, Emil Schlegel, Nils Liljequist, and others. Practitioners claim to believe that the iris reveals, through changes in pigment and structure, abnormal conditions throughout the body; that the anterior portion of the iris “reflexly” corresponds in its topography to the major tissue structures of the body, each organ, gland and tissue being represented in a specific location in the left or right iris, or both; that the iris undergoes specific changes corresponding to pathological alterations in specific organs and tissues in the body; and that inherent weaknesses and strengths and the degree of nervous system sensitivity are shown in the iris by the crypts and

separations in the trabeculae, by trabecular spacing, and by parallel, curved “cramp rings” concentric with the outer perimeter of the iris.

macrobiotics (Greek *makros* ‘long’ + *bios* ‘life’) A way of life emphasizing healthful diet and lifestyle, with avoidance of foods, beverages, clothing, body-care products, and practices that are viewed as toxic, out of harmony with nature or the environment, or otherwise objectionable. The macrobiotic way of life takes into account all aspects of human life and acknowledges the interrelation of body, mind, and spirit.

The macrobiotic diet emphasizes “organically” grown foods, whole grains, and tofu, and avoids meat and animal fat, eggs, poultry, dairy products, hot spices and condiments, refined sugars, refined and polished grains, chocolate, coffee, tea, carbonated beverages, canned, frozen, or irradiated foods, and those that have been artificially colored, preserved, sprayed, or chemically treated.

The macrobiotic lifestyle also includes exercise, spending time outdoors, eating and drinking only to satisfy hunger and thirst, getting adequate sleep, and avoiding long baths, toxic cleaning products, synthetic fabrics, scented cosmetics, metallic ornaments and accessories, electric or microwave ovens, aluminum or Teflon-coated pots, and prolonged exposure to the electromagnetic fields generated by television sets and computer monitors.

massage therapy Massage therapy, one of the oldest methods in healthcare practice, is the scientific manipulation of the soft body tissues to return those tissues to their normal state. Massage consists of a group of manual techniques that include applying fixed or movable pressure and holding and causing the body to move. The hands are principally used, but sometimes forearms, elbows, and feet are employed as well. These techniques can affect the musculoskeletal, circulatory, and nervous systems. Massage therapy embraces the concept of a healing power in nature, and seeks to help the body heal itself and achieve or enhance health and well-being.

Massage therapists are licensed by 25 states and the District of Columbia. Most states require 500 or more hours of education from a recognized school program and a licensing examination. Massage therapy techniques include Swedish massage, deep-tissue massage, sports massage, neuromuscular massage, and manual lymph drainage.

naturopathy A system of healthcare using education, counseling, naturopathic modalities (nonmanipulative bodywork and exercise), and natural substances and forces including foods, food extracts, vitamins, minerals, enzymes, digestive aids, botanicals, air, water, heat, cold, sound, and light.

Naturopathy began in Europe during the 19th century with the work of various nonphysicians who proposed regimens based on diet, exercise, air, water, and sunlight to maintain and restore health. Central to all naturopathy is belief in a healing force in nature (*vis medicatrix naturae*) that can be stimulated and directed by a proper choice of diet and lifestyle.

Currently CAM encompasses a motley assortment of hygienic, diagnostic, and therapeutic ideologies and methods with just one thing in common: they have thus far failed to gain acceptance as part of mainstream scientific medicine because they lack both a valid scientific basis and adequately documented evidence of clinical efficacy.

orthomolecular therapy (megavitamin therapy) Orthomolecular therapy is defined by its advocates as the treatment of disease by varying the concentrations of substances normally present in the human body. The underlying presumption is that many diseases are caused by molecular imbalances that are correctable by administration of the right nutrient molecules at the right time.

In the 1950s some psychiatrists experimented with massive doses of nicotinic acid and other nutrients in the treatment of severe mental problems. Initially termed “megavitamin therapy,” this mode of treatment was renamed “orthomolecular medicine” as the regimen was expanded to include other vitamins, minerals, hormones, and diet, as well as conventional drug therapy and electroshock. It is now used by a number of physicians for the treatment of both mental and physical illness, including particularly hyperactivity in children, mental retardation due to Down syndrome and other conditions, autism, schizophrenia, dementia, and cancer.

Dosages of vitamins and minerals administered in an orthomolecular regimen are typically 20 to 600 times the recommended daily allowances. All agents prescribed can be obtained without prescription. However, in the dosages administered, most of them can have toxic effects, particularly in children and during pregnancy.

A task force of the American Psychiatric Association that investigated the claims of psychiatrists espousing orthomolecular medicine noted that these practitioners used unconventional methods not only in treatment but also for diagnosis. Its conclusion was that the credibility of the megavitamin proponents was low, and that it was further diminished by their consistent refusal to perform controlled experiments and report results in a scientifically acceptable fashion.

osteopathy A system of therapy developed by Andrew Taylor Still (1828-1917), an American physician who believed that disease is caused by mechanical interference with nerve and blood supply and can be cured by manipulation of deranged or displaced bones, nerves, and muscles, particularly in the spine. In his autobiography, he claimed that he could “shake a child and stop scarlet fever, croup, diphtheria, and cure whooping cough in three days by a wring of its neck.”

Still was antagonistic toward contemporary medicine and particularly surgery. Rejected as a cultist by organized medicine, he founded the first osteopathic medical school in

Osteopathic medicine has gradually repudiated its cultist roots and incorporated the theories and practices of scientific medicine. Except for additional emphasis on musculoskeletal diagnosis and treatment, the scope of osteopathy is essentially that of medicine.

Kirksville, Missouri, in 1892. The basic principles of osteopathy are that the human body is an integrated organism in which no part functions independently; that abnormal structure or function in one part of the body exerts unfavorable influences on the other parts and, therefore, on the body as a whole; that through a complex system of internal checks and balances it tends to be self-regulating and self-healing in the face of stress and disease; and that adequate function of all body organs and systems depends on the integrating forces of the nervous and circulatory systems.

Today there are 19 accredited colleges of osteopathic medicine, granting the degree of Doctor of Osteopathy (D.O.), and about 40,000 osteopathic practitioners in the United States. The American Osteopathic Association (AOA) recognizes more than 60 specialties and subspecialties, but a majority of osteopaths enter family practice. Osteopathic physicians are licensed to practice in all states.

Osteopathic medicine has gradually repudiated its cultist roots and incorporated the theories and practices of scientific medicine. Except for additional emphasis on musculoskeletal diagnosis and treatment, the scope of osteopathy is essentially that of medicine. The percentage of practitioners who use osteopathic manipulative treatment (OMT), and the extent to which they use it, decline yearly. Since 1985, osteopathic physicians have been able to obtain residency training at medical hospitals, and the majority have done so. Since 1993, DOs who completed osteopathic residencies have also been eligible to join the American Academy of Family Practice, which had previously been restricted to MDs or DOs with training in accredited medical residencies.

Despite the close assimilation of osteopathy to medicine, osteopathic organizations prefer to retain a separate identity and continue to exaggerate the minor differences between the two fields. They also claim that osteopathy is the only branch of mainstream medicine that follows the Hippocratic approach, and cling to the doctrine that the musculoskeletal system is central to the human health and well-being.

An exception to the rapprochement of osteopathy and scientific medicine is cranial osteopathy, also called craniosacral therapy, founded in the 1930s and currently practiced by some osteopaths, massage therapists, chiropractors, dentists, and physical therapists.

Practitioners of this method claim that the skull bones can be manipulated to relieve headache, neck and back pain, TMJ dysfunction, chronic fatigue, disorders of motor coordination, ocular problems, clinical depression, hyperactivity, attention

deficit disorder, and many other conditions. They also claim that a rhythm exists in the flow of the fluid that surrounds the brain and spinal cord and that diseases can be diagnosed by detecting aberrations in this rhythm and corrected by manipulating the skull.

reflexology A method of therapeutic massage in which the practitioner applies pressure to the subject's feet with specific thumb, finger, and hand techniques. Reflexology is based on the theory that there are "reflex" points along ten longitudinal zones of the feet corresponding to other parts of the body, and the further premise that stimulation of these points can promote or restore health by balancing and normalizing the corresponding organ or structure. No official organization sets standards of training or professional practice or certifies practitioners.

rolfing A method of healing founded by Ida R. Rolf, an American biochemist, and based on the notion that the energy that radiates through the body produces injury and disease if the body is not aligned vertically with the pull of the earth's gravitational forces. Rolfers seek to remodel or realign the posture of sick persons toward the vertical ideal.

shiatsu (Japanese *shi* 'finger' + *atsu* 'pressure') A Japanese system of therapeutic massage based on traditional Chinese medicine, shiatsu is alleged to strengthen the immune system, mitigate pain, improve posture and breathing, and promote or restore health by correcting imbalances in the flow of energy and by enabling the subject to attain deeper self-awareness and inner harmony.

The subject lies fully clothed on a massage table, futon, or floor mat. The practitioner applies various forms of therapeutic touch (pressing, hooking, sweeping, shaking, rotating, grasping, vibrating, patting, plucking, lifting, pinching, rolling, brushing, and walking barefoot on the subject's back, legs, and feet) to some of the same points and energy channels, or meridians, used in acupuncture. The practitioner's fingers, hands, knees, or elbows may cover several of these points simultaneously. Advocates emphasize the importance of "touch communication" between practitioner and client. A session is sometimes referred to as a dance or duet performed by practitioner and client together.

tai chi (Mandarin *tai* 'highest' + *ji* 'reach') A Chinese system combining meditation and movement, designed to foster mental tranquillity and physical health and vitality. The movements of tai chi, many of which are derived from martial exercises, are supposed to favor the circulation and distribution of the life force, besides developing balance, coordination, and fine-scale motor control. Tai chi has historical connections with Taoism, a Chinese philosophical system founded by Lao Tsu in the 6th century B.C., which espouses a calm, reflective, and mystical view of the world steeped in the beauty and tranquillity of nature.

yoga (Sanskrit *yogah* 'union, joining') A Hindu discipline intended to train the subject to unite body, mind, and spirit in an attempt to enhance health and overall fitness and well-being. Yoga is thousands of years old and an essential part of the practice of ayurveda. It is not a religious system; spiritual reflection is encouraged but not required. Many ancient texts mention yoga, including the Rig-Veda (written approximately 2000 B.C.), the Upanishads (scriptures of ancient Hindu philosophy), and the Bhagavad Gita.

Yoga was introduced to the U.S. at the 1893 Chicago World's Fair. Of the many different forms of yoga, the one most commonly taught in this country, hatha yoga, uses postures, breathing exercises, and meditation. Postures (asanas) are designed to increase flexibility and to induce both physical and mental relaxation. Breathing exercises (pranayamas) emphasize deep, diaphragmatic breathing, which is seen as vital to the maintenance of health. Concentration on breathing is also central to meditation.

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Yoga is taught in individual or group classes. No national standard for teacher certification exists. Persons beginning yoga therapy are advised to avoid pushing themselves beyond the limits of comfort and to take into account age, physical condition, and the presence of disease or disability.

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Complementary and alternative medicines (CAMs) are treatments that fall outside of mainstream healthcare. A number of complementary and alternative treatments are typically used with the intention of treating or curing a health condition. Examples include: homeopathy, acupuncture, osteopathy, chiropractic, herbal medicines. Considering the alternatives. Physician Exec. Nov-Dec 1998;24(6):6-14. Therapies variously described as alternative, complementary, or unconventional because they lie outside the realm of scientific medicine practiced by graduates of orthodox U.S. medical schools are gaining mainstream respectability despite many questions about their efficacy and safety. Depending on definitions, surveys indicate that fewer than 10 percent to nearly 40 percent of Americans supplement or substitute for conventional health care with alternative systems of medical practice. Spending for complementary and alternative medicine (CAM) nationwide has been estimated at up to \$14 billion a year. Complementary and Alternative Medicine. What do scientists in Britain think about alternative therapies? Or La Kennedy reads a surprising survey? Is complementary medicine hocus-pocus or does it warrant large-scale scientific investigation? There is enough anecdotal evidence to suggest that at least some of the alternative therapies are effective for some people, suggesting this is an area ripe for research. When asked if complementary and alternative medicine should get more research funding, scientists believed the top three (acupuncture, chiropractic and osteopathy) should get money, as should herbalism. Alternative medicine is that one branch of medicine that majority of the people have second guesses about. While the pros and cons of alternative medicine are quite extensive, there could very well be a number of factors that could make people question the integrity of the impacts the same would have on the body. While the stress is often considered as a burden on the mental health, it has been found to have physical ramifications on the health as well. It is best suggested to ensure that you do opt for the same mainly because of the fact that it has been found to have better impacts on one's heart health and such as well.