

A SCIENTIFIC LOOK AT ALTERNATIVE MEDICINE

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Homeopathy, Naturopathy, and Other "Holistic" and "New Age" Approaches

HOMEOPATHY

Background

Invented by Samuel Hahnemann in late 1700's. A mild alternative to the harsh medical treatments of the time. Became prominent in mid- to late 1800's before declining (most American homeopathic colleges were closed following the 1910 Flexner Report). Now enjoying new popularity.

Has significant support in England, France, India, and some other countries. British royal family consults homeopaths.

Remedies in *Homeopathic Pharmacopeia* remain legal under 1938 Federal Food, Drug, and Cosmetic Act. (This was the result of political pressure by a powerful senator who was a homeopath.) They are presumed safe, since most contain no detectable active ingredients, but are not required to be shown effective. Included in Medicare Act (1965).

Homeopathy is not currently a licensed profession (except in CT, AZ, and NV, where it is available to MD's and DO's); rather, practitioners may be professionals in various areas ranging from MD's to physical therapists (must be licensed in certain professions to prescribe homeopathic remedies). There are about 2500 homeopathic physicians; perhaps thousands of other health professionals are homeopaths. Also over-the-counter and mail-order sales of remedies have increased (estimated \$200 million in 1995).

M.D.'s and O.D.'s may be board certified, with Primary Care Certificate in Homeotherapeutics and Diplomate in Homeopathy (DHT) available.

Insurance coverage: some plans cover homeopathic physician services but not prescriptions. "Managed care networks and HMOs have generally not included homeopaths on their rosters as specialists. Whereas physicians in HMOs routinely refer patients to homeopaths, the HMO rarely reimburses patients for those services." (E.H. Chapman, "Homeopathy," in Jonas and Levin (eds) *Essentials of Complementary and Alternative Medicine*)

Principles

Diseases are disturbances in the body's ability to heal itself.

"Like cures like." Substances that produce symptoms characteristic of the disease are used, in small quantities, to stimulate the body to heal itself. These are not the actual causative agents, but rather agents that produce similar symptoms, or *similia*, in healthy individuals. Detecting such effects is referred to as "proving" the remedy.

"Law of infinitesimals": The smaller the dose, the more powerful. Vigorous shaking (*succussion* or *dynamization*) used at each dilution step to generate "memory" or "essence" of the molecules. Insoluble molecules are crushed and diluted with lactose (*trituration*). Number of dilutions indicated by "X" (10-fold) or "C" (100-fold). Thus, 6X = 10^6 dilution; 2C = $100^2 = 10^4$ dilution. Typical remedies are 6X to 30X; "high potencies" may range from 200C to 100,000C.

Hering's Law: healing progresses from internal organs outward; from the upper to the lower part of the body; and in reverse order of the original onset of symptoms.

"Hahnemann believed that homeopathic remedies must be appropriately prescribed for individual body types and personalities, based on the ancient humoral theories of Galen. According to these theories, there were four body types and personalities, based on which body 'humor' predominated [blood, black bile, yellow bile, phlegm]...he also suggested that there are a corresponding few primary causes of acute and chronic illnesses, which he called 'miasms.' The first miasm, known as 'psora' (itch) refers to a general susceptibility to disease and may be considered the source of all chronic diseases. The other two miasms in homeopathic theory are the venereal diseases syphilis and sycosis (gonorrhea). Together, these three conditions were considered to be the cause of at least 80 per cent of all chronic diseases." (Ramey et al., "Homeopathy and Science: A Closer Look")

Practice and scope

Highly individualized treatment - looks for unusual symptoms in the design of treatment for a particular patient. The homeopath will then compare the spectrum of symptoms to the symptoms related to various remedies, and try to pick the most appropriate match. A development that came much later than Hahnemann is the prescribing of a *constitutional remedy*. Here, in taking a history the homeopath will ask about emotions, food preferences, and other traits, and the remedy is based largely on these rather than on the symptoms of the disease. Note that the emphasis is on subjective feelings of patients, in contrast to objective findings (e.g., lab tests) in scientific medicine.

Final preparation may be in alcohol-water mixture, or added to sucrose-lactose pellets. Also are creams for topical use.

"...Homeopathic medicines are classically given in single doses at intervals ranging from minutes to months." (Chapman)

Over 2000 remedies, 200-300 of which are used most commonly. Certain remedies known as "polychrests" match so many symptoms that one of them is likely to end up as the prescribed remedy.

Tissue salts are low-potency preparations from inorganic compounds. They were developed by Schussler, who felt that diseases were due to disturbances in cellular salt concentration.

The "modern" (but not the "classical") homeopath may combine multiple remedies in a treatment (sometimes called *complex homeopathy*).

In *isopathy*, extremely dilute doses of the causative agent, e.g., pollen for hayfever, are employed. Such remedies are sometimes called *nosodes*. Examples of sources include pus, cancerous tissue, bacteria in sputum, or stool cultures. This approach was condemned by Hahnemann.

"The top 10 diagnoses treated by homeopaths surveyed were asthma, depression, otitis media, allergic rhinitis, headache, psychological complaints, allergy, dermatitis, arthritis, and high blood pressure." (Chapman)

Over-the-counter sales for heart disease, kidney disease, cancer, multiple sclerosis, as well as many minor

diseases and conditions. However, according to FDA regulations, nonprescription homeopathic remedies are to be sold only for self-limiting conditions.

Homeopaths may be trained at naturopathic schools in the U.S., or in homeopathic colleges abroad. Training can also be obtained in various short courses and seminar programs. Correspondence courses are also available.

Arguments in support:

Anecdotal evidence - many satisfied patients

Some individual research studies with positive findings (1995-present only):

- Taylor et al. (2000) *BMJ* 321, 471-476: respiratory allergies (however, used isopathy)
- Jacobs et al (2000) *J. Alt. Complement. Med.* 6, 131-139: diarrhea in children. Combined results and meta-analysis of three trials were also reported (Jacobs et al. (2003) *Pediatr. Infect. Dis. J.* 22, 229-234)
- Weiser et al. (1998) *Arch. Otolaryngol. Head Neck Surg.* 124, 879-885: vertigo (see critique below)
- Chapman et al. (1999) *J. Head Trauma Rehabil.* 14, 521-542: brain injury
- van Haselen and Fisher (2000) *Rheumatology* 39, 714: homeopathy was as effective as a NSAID gel for osteoarthritis (but PDR does not indicate any topical utilization of this drug!).
- Overbaum et al. (2001) *Cancer* 92, 684-690: chemotherapy-induced stomatitis
- Jacobs et al. (2001) *Pediatr. Infect. Dis. J.* 20, 177-183: otitis media
- Weatherley-Jones et al. (2004) *J. Psychosom. Res.* 56, 189-197: chronic fatigue syndrome (but noted evidence was "weak but equivocal").
- Bell et al. (2004) *Rheumatology* 43, 577-572: fibromyalgia

Reviews and meta-analyses supporting effectiveness:

- Linde et al. (1997) *Lancet* 350, 834-843: concluded that results "are not compatible with the hypothesis that the clinical effects of homoeopathy are completely due to placebo" (but see also below).
- Barnes et al. (1997) *J. Clin. Gastroenterol.* 25, 628-633, post-operative ileus: results favored homeopathy compared to placebo, though no particular remedy could be identified as effective.
- Cucherat et al. (2000) *Eur. J. Clin. Pharmacol.* 56, 27-33: "There is some evidence that homeopathic treatments are more effective than placebo; however, the strength of this evidence is low because of the low methodological quality of the trials. Studies of high methodological quality were more likely to be negative than the lower quality studies."
- Jonas et al. (2000) *Rheum. Dis. Clin. N.A.* 26, 117-123: rheumatic disease
- Jonas et al. (2003) *Ann. Intern. Med.* 138, 393-399: "may be effective for the treatment of influenza, allergies, postoperative ileus, and childhood diarrhea." (see below for negative conclusions)

Are other laboratory and animal studies considered to be supportive of homeopathy.

Alleged to work on unconscious people, infants, animals, and even plants, ruling out placebo effects.

Arguments against:

Some homeopathic remedies are so dilute that they cannot contain any of the original molecules. Homeopathic explanations for this in terms of dynamizing the solution (causing the solution to retain its electromagnetic pattern, etc.) are *inconsistent with knowledge of chemistry and physics*. Not clear how such a "memory" would be retained when the agent enters the body (e.g., in crossing epithelial cell membranes). Also, in many cases the remedy is transferred from an alcohol solution to a lactose pill, a dramatically different physical structure which somehow retains the "memory." Why should water retain a "memory" of the

homeopathic ingredient and not of the many other substances with which it had contact?

More powerful effects at low doses contradicts well-established principles of pharmacology. No rationale for why a putative "memory effect" should *increase* with dilution.

Basic theory does not make sense. If the body already has symptoms, and these do not provoke the proper healing response, why should adding a tiny dose of something producing similar symptoms do so?

Placebo effects and observer bias may explain many anecdotal reports of success. The presence of a comforting person might even account for effects in infants and animals.

Some individual studies showing lack of effectiveness:

- Lökken et al. (1995) *BMJ* 310, 1439-1442: pain and other events after oral surgery
- Hart et al. (1997) *J. R. Soc. Med.* 90, 73-78: postoperative recovery in hysterectomy
- de Lange de Klerk et al. (1997) *BMJ* 309, 1329-1332: children with respiratory infections
- Walach et al. (1997) *Cephalalgia* 17, 119-126: chronic headaches
- Whitmarsh et al. (1997) *Cephalalgia* 17, 600-604: migraine.
- Smolle et al. (1998) *Arch. Dermatol.* 134, 1368-1370: warts
- Fisher and Scott (2001) *Rheumatology* 40, 1052-1055: rheumatoid arthritis
- Lewith et al. (2002) *BMJ* 324, 520-523: asthma (as with the comparable studies of Reilly and coworkers, this employed isopathy)
- White et al. (2003) *Thorax* 58, 317-321: asthma
- Stevinson et al. (2003) *J. Roy. Soc. Med.* 96, 60-65: pain and bruising in hand surgery

Reviews and meta-analyses with negative conclusions (homeopathy ineffective, or insufficient evidence to conclude that it is effective):

- The Homoeopathic Medicine Research Group, a European expert panel: general review
- Cochrane Reviews: asthma (2004); Oscillococinum for prevention and treatment of influenza (2004) (but said some data "promising").
- Ernst (1998) *Arch. Surg.* 333, 1187-1190: meta-analysis of studies of arnica, the most frequently used homeopathic remedy
- Ernst (*J. Pain Symptom Manage.* 18, 353-357 (1999)): headaches and migraine
- *Prescrire Int.* 10, 24 (2001)): prevention and treatment of influenza
- Jonas et al. (2003) *Ann. Intern. Med.* 138, 393-399: "Evidence suggests that homeopathy is ineffective for migraine, delayed-onset muscle soreness, and influenza prevention. There is a lack of conclusive evidence on the effectiveness of homeopathy for most conditions." (see above for positive conclusions)
- Almeida (2003) *Rev. Hosp. Clín. Fac. Med. S. Paulo* 58, 324-331: "The present review could not identify any homeopathic clinical trial that was positively replicated by an independent group."
- Shang et al. (*Lancet* 366, 726-732 (2005)) analyzed 110 trials of homeopathy for various conditions. The authors concluded that "when analyses were restricted to large trials of higher quality there was no convincing evidence that homoeopathy was superior to placebo..." and "This finding is compatible with the notion that the clinical effects of homoeopathy are placebo effects." An accompanying editorial stated that "Doctors need to be bold and honest with their patients about homeopathy's lack of benefit..."

Critiques and further comments on studies and reviews considered to be positive (see above):

- Meta-analysis by Linde et al. - despite concluding that overall the results were not explainable by placebo, they "found insufficient evidence...that homoeopathy is clearly efficacious for any single clinical condition." Moreover, methodological problems might explain the results even if placebo doesn't. The same authors later reevaluated and updated their analysis, concluding that they likely had "overestimated the effects of homeopathic treatments" (Linde et al. (1999) *J. Clin. Epidemiol.* 52, 631-636). Ernst (*Perfusion* 11, 291-292 (1998)) re-analyzed the same data set but used more rigorous

standards for inclusion; he concluded that there was no evidence of effectiveness beyond placebo.

- In the vertigo study of Weiser et al., homeopathy was found to be as effective as betahistine. However, Sampson (*Arch. Otolaryngol. Head Neck Surg.* 129, 497 (2003)) noted that betahistine had long ago been found to be ineffective. Thus, the study showed that homeopathy was no better than placebo. Other flaws were reported by Sampson in *Scientific Rev. Alternative Med.* 2(2), 38-40.

Linde and Melchart (*J. Altern. Complement. Med.* 4, 371-388 (1998)) noted that "If the claims of classic homeopaths - that striking responses to homeopathic treatment occur quite frequently, that overall homeopathy is a clearly effective therapy, and that the remedy is the main cause of induced changes - are correct, it should be much easier to obtain more convincing and consistent results, even under the problematic conditions of double-blind placebo-controlled clinical trials."

In "A Systematic Review of Systematic Review of Homeopathy," Ernst (*Br. J. Clin. Pharmacol.* 54, 577-582 (2002)) concluded that there is "no condition which responds convincingly better to homeopathic treatment" than to controls; that there was no homeopathic remedy convincingly demonstrated to yield results different from placebo; and that the evidence to date "does not warrant positive recommendations for its use in clinical practice."

Vickers (*Forsch. Komplementärmed.* 6, 311-320 (1999)), review of *pre-clinical* research in homeopathy: "There is a lack of independent replication of any pre-clinical research in homeopathy. In the few instances where a research team has set out to replicate the work of another, either the results were negative or the methodology was questionable."

Most published studies are in homeopathic journals rather than in regular medical or scientific journals.

Possibility that in some clinical studies the homeopathic remedies have been adulterated to contain pharmacologically active substances. Need for independent analysis (most recent studies include such analysis).

Interprets all symptoms as results of body's attempts to heal itself, which is inconsistent with medical knowledge.

In the original compilations of "provings," "the common accidents of sensations, the little bodily inconveniences to which all of us are subject, are seriously and systematically ascribed to whatever medicine may have been exhibited, even in the minute doses I have mentioned, whole days or weeks previously" (Oliver Wendell Holmes). Presumably the subject would be eating and drinking many other things, and be subject to many environmental conditions, during this period. Also, the subjects knew what they were taking, which could have influenced the reported symptoms. Extensive lists of symptoms were even reported in response to inert substances like salt and charcoal. Many of the provings apparently were done in violation of Hahnemann's own principles, using symptoms of ill patients and also in response to highly dilute remedies. Some remedies were not established by provings, but simply by their apparent success in treatment.

In his article "Homeopathy's 'Law of Similars,'" Stephen Barrett noted the following:

"A Dictionary of Practical Materia Medica," a widely used 3-volume set authored by John Henry Clarke, M.D., illustrates the foolishness involved in provings. The book contains about 2,500 pages that describe the symptoms that supposedly were reported following administration of about 1200 substances. Most descriptive pages contain more than 100 claims, which means that total number of symptoms exceeds 200,000. The book does not indicate when or how the original "provings" were done or who reported most of the specific findings. Thus it would be impossible to examine whether the studies were properly done, who did them, and whether the findings were accurately reported.

Many of the listed symptoms are odd. *Lac felinum* includes "Cannot bear the smell of clams, of which she is naturally fond." *Lacrodectus mactans* includes "Screams fearfully, exclaiming that she would lose her breath and die." *Magnesia sulphurica* includes "stupidity." *Oleum animale* includes "Singing, tinkling, and buzzing in ears." *Natrum*

carbonicum includes "hurries out of bed in the morning." Some listings include symptoms that occur predominantly on one side of the body, such as "sickening sensation in left testicle." All are supposedly useful in determining whether the patient might "fit" a particular remedy.

Says treatments may make symptoms worse before they get better, increasing the chance that the natural course of disease may be interpreted as a positive result (and allowing negative results in clinical trials to be rationalized). (Another rationalization: remedies in the wrong potency can give adverse rather than favorable responses.)

Characteristics of pseudoscience

Reliance on anecdotal evidence rather than controlled clinical studies (although some such studies are now appearing).

Violation of well-established principles of chemistry.

Basic theory and methodology unchanged in more than 200 years. Essentially a dogma established by a founding charismatic leader. (However, several auxiliary ideas, some of them contradictory, were added by various schools over the years.)

Claim to be able to cure a wide range of diseases and emotional conditions with a single curative principle.

False claim that the field of immunology supports the principles of homeopathy. Resemblance is only superficial:

- While small quantities of antigens do stimulate the immune system, these are discrete molecules, and are not more potent at greater dilution.
- Antigens used in vaccines are related to the actual causative agents of diseases they prevent, unlike classical homeopathic remedies.
- Vaccines prevent diseases, rather than curing them or relieving the symptoms.

Invokes a vague, undefined vital force in allowing healing; cannot identify any particular part of the body which is affected.

Hahnemann "claimed that chronic diseases were manifestations of a suppressed itch (*psora*), a kind of miasma or evil spirit" (S. Barrett, "Homeopathy: The Ultimate Fake").

Elements of primitive *sympathetic magic*, involving superficial similarities (e.g., a delicate flower for treating a delicate woman)

Other points

French scientist Jacques Benveniste (died 2004) received much publicity for his studies allegedly showing *in vitro* effects of extremely high dilutions (Davenas et al. (1988) *Nature* 333, 816-8). However, serious flaws were found in this research (Maddox et al. (1988) *Nature* 334, 287-290). More recently, Benveniste claimed that homeopathic "memory" consists of electromagnetic waves, which can be recorded on a computer and transmitted electronically. An effort to reproduce his effects of digital signals found no evidence in support (Jonas et al. (2006) *FASEB J.* 20, 23-28).

NATUROPATHY

Healing with "natural" means such as diet and lifestyle. May include vitamins, herbs, exercise, massage, etc. May oppose use of drugs. May incorporate alternative approaches such as iridology, acupuncture, hair analysis, and homeopathy. Advocates natural childbirth outside of hospital. "Naturopathy did not spring from a unified doctrine and lacks coherence in both theory and practice. It is characterized by a miscellany of vitalistic approaches..." (Raso, *Alternative Healthcare: A Comprehensive Guide*, p. 101).

Vitalism is "a doctrine that the functions of a living organism are due to a vital principle distinct from physicochemical forces" [Webster's New Collegiate Dictionary] which denotes a paranormal "Life Force." Vitalists are generally not only nonscientific, but *antiscientific* because they abhor the reductionism (v. holism), materialism (v. etherealism) and mechanistic (v. mystical) causal processes of science. Its belief in Vitalism (*Vis Medicatrix Naturae*) can be seen in its over-riding tendency to overstate the body's self-healing power, and the beneficence of "natural" remedies (eg, whole herbs alleged to be superior to drugs extracted from them). (NCAHF, "Naturopathy")

Based on idea that diseases are caused by toxins that can be eliminated by natural methods (compare metabolic therapy for cancer treatment). "Most naturopaths believe that virtually all diseases are within their scope of practice." (Raso, p. 102) Roots in the 19th century *hydropathy* (water-cure) movement, as well as in *Naturopathologie*, a romantic movement.

"Naturopathy is *eclectic* (practitioners select whatever he/she personally likes from a cacophony of philosophically-based procedures), and *empirical* (practiced by subjective clinical experiences)." (NCAHF)

Atwood ("Naturopathy: Minority Report to the Massachusetts Legislature") wrote:

If there is a modus operandi that seems to characterize the field of naturopathy, it is the ease with which it embraces virtually any unlikely pseudoscientific health claim, no matter how preposterous, while denigrating scientific medicine.

Are four U.S. and two Canadian colleges of "naturopathic medicine" offering 4-year programs; the most prominent is Bastyr University in Seattle. N.D. degree.

A review of the curricula of accredited naturopathic schools shows that their courses of study include a mixture of *medical discards* (eg, colonics, water therapies, herbalism), *pseudosciences* (eg, acutherapy, homeopathy, gravity guidance, hair analysis for nutritional assessment, cleansing - at least one college offers preceptorships at Mexico border clinics which traffic in cancer quackery), and *modalities expropriated from biomedicine* (eg, nutritional counseling, hypnosis, natural childbirth, psychological counseling). An important difference is that at medical schools these topics are likely taught by more a [sic] qualified faculty, and applied with greater restraint by better trained and more rational practitioners. Much financial support for naturopathic education comes from the health foods industry, herbal trade associations, homeopathic suppliers, and other's [sic] who disdain consumer protection law and science. (NCAHF)

Licensed in 15 states (including California as of 2005) plus District of Columbia. Illegal in SC and TN. Estimated to be about 10,000 naturopaths (total probably includes other health professionals who use some naturopathic approaches); 4000-5000 graduates of the five schools noted above; 1300 licensed practitioners in U.S. as of 2000. Professional associations: American Association of Naturopathic Physicians; American Naturopathic Medical Association; and American Naturopathic Association. The AANP appears to be aligned with the major schools, and is pushing for licensing of naturopaths. On the other hand, another group, the Coalition for Natural Health, opposes such legislation, preferring to retain the traditional status of "true naturopaths."

Boon et al. (*BMC Complement. Alt. Med.* 4:14 (2004)) surveyed practice patterns in Washington and Connecticut. "Almost 75% of all naturopathic visits were for chronic complaints, most frequently fatigue, headache, and back symptoms...The most commonly prescribed naturopathic therapeutics were: botanical medicines (51% of visits in Connecticut, 43% in Washington), vitamins (41% and 43%), minerals (35% and 39%), homeopathy (29% and 19%) and allergy treatments (11% and 13%)." 75% of visits were by women.

Not covered by Medicare or most insurance plans. Four states require insurance to cover.

Beyerstein and Downey (2000), in Sampson and Vaughn, eds, *Science Meets Alternative Medicine*, noted that their "bibliographic searches failed to discover any properly controlled clinical trials that supported claims of the profession, except in a few limited areas where naturopaths' advice concurs with that of orthodox medical science. Where naturopathy and biomedicine disagree, the evidence is uniformly to the detriment of the former."

"Natural Hygiene, a Spartan form of naturopathy, is a comprehensive philosophy of health and 'natural living' whose ideal diet consists exclusively of vegetables, fruits, nuts, and seeds - all uncooked and minimally processed." (Raso, p. 109). Popularized by Harvey and Marilyn Diamond (*Fit for Life* and *Living Health*) and American Natural Hygiene Society. Rejects medications, blood transfusion, radiation, dietary supplements.

A danger in naturopathic practice relates to the "belief in the so-called *healing crisis* which holds that adverse reactions associated with their practices (herbal remedies, fasting, colonics, etc.) are due to 'toxins' being expelled; and, that the worse are these adverse symptoms the worse would have been the future diseases being prevented. This false belief allows a naturopath to assert that the patient is 'getting better' if they feel good, bad, or indifferent." (NCAHF) Thus, potentially dangerous conditions may remain untreated by effective medical procedures.

HOMEOPATHY AND NATUROPATHY

Lee et al. (*Arch. Pediatr. Adolesc. Med.* 154, 75-80 (2000)) surveyed homeopaths and naturopaths in Massachusetts. "Nearly all reported treating children, but fewer than half of the practitioners reported any formal pediatric training. Initial patient visits typically lasted more than 1 hour and cost \$140 to \$150...Most practitioners reported that they did not actively recommend immunizations and fewer than half of the nonphysician practitioners reported that they would refer a 2-week-old neonate with a fever to a medical doctor or emergency medical facility."

"HOLISTIC" MEDICINE

Holistic medicine, defined as an approach that considers the whole person (including psychological and emotional needs, the family situation, diet, exercise, lifestyle, etc.), is properly part of modern scientific medicine. However, in practice, the term "holistic" is used by many alternative practitioners to include unconventional methods of diagnosis and treatment.

Robert Imrie, DVM, has pointed out that many so-called "holistic" modalities do *not* consider the whole patient, because they ignore modern knowledge in anatomy and physiology (e.g., nervous system, endocrine system), as well as knowledge of the causes of diseases (e.g., microbes). Instead, they rely on outdated and incomplete views of the workings of the human body.

There is an American Holistic Medical Association and an American Holistic Nurses Association. Most "holistic" physicians are family practitioners. The American Board of Holistic Medicine gave its first certification exam in 2000.

IRIDOLOGY

Background and general description

Developed by Ignatz von Peczely in Hungary c. 1866. Promoted in U.S. by Bernard Jensen.

Theory: "Via the direct neural connection of the surface layers of the iris with the cervical ganglion of the sympathetic nervous system, impressions from all over the body are conveyed to the iris" (Wolf (1979) *Applied Iridology*, as quoted by Worrall (1983) *Skept. Inq.* 7(3), 23-35). This provides a means to monitor conditions throughout the body by examination of the iris.

Iridologists consult detailed eye charts (possibly using a computer) with maps of correspondences of parts of body with parts of retina in making diagnoses. May also make recommendations for treatment, e.g., with diet, exercise, herbs.

Arguments in favor:

Anecdotal support. May have high level of patient satisfaction.

May recommend programs that include exercise and good diet, thus benefitting patients.

Arguments against:

Inconsistent with known anatomy of nervous system. Problem of left-right crossover.

Many of the various charts being used are inconsistent in their details.

Controlled clinical studies, using iris photos, show iridologists unable to detect disease:

- Simon, Worthen, Mitas (1979) - controls and kidney disease patients
- Cockburn (1981) - before/after photos of subjects with acute disease.
- Knipschild (1988) - gallbladder disease patients
- Worrall et al. (2002) - orthopedic trauma

Most diseases diagnosed are vaguely defined, such that spontaneous improvement or psychological aspects could be involved in reported successes.

Successful diagnoses could involve "cold reading," such as employed by fortune-tellers, in which a combination of educated guesses and feedback from patient are used to give the impression that the reader has access to hidden information.

Characteristics of pseudoscience

Claims to make subclinical evaluations (conditions which do not yet have symptoms; therefore success can be claimed if advice is followed and the condition does not develop)

Rejection of test conditions after unfavorable clinical test performed

Side effects

Delay in treatment when harmful condition not diagnosed

Mental distress of false diagnosis

Expense of worthless diagnosis and further unneeded tests or treatments

REFLEXOLOGY

"Ancient variant of acupuncture. Reflexology is purportedly useful in assessing and improving the function of specific body parts. Proponents hold that all bodily organs have corresponding external 'reflex points' - on the scalp, ears, face, nose, tongue, neck, back, arms, wrists, hands, abdomen, legs, and feet - and that manipulation of these points can enhance the flow of 'energy.' Reflexology allegedly can relieve asthma, constipation, migraines, sinus congestion, and diseases of the kidney, liver, and pancreas." (Raso, *"Alternative Healthcare": A Comprehensive Guide*) Other explanations include increased flow of blood (with nutrients), or enhanced nerve conduction, to the corresponding areas.

The body is sometimes pictured as being divided into ten longitudinal zones.

Reflexology using the foot is the most common. Auriculotherapy (see below) is a type of reflexology focused on the ear.

In general, these approaches are inconsistent with scientific knowledge of anatomy and physiology. For example, foot reflexologists assign a key regulatory role over numerous body functions to the foot.

Possibly some benefits could arise if massage relieves stress related to problems elsewhere.

Positive study:

- Oleson and Flacco (*Obstet. Gynecol.* 82, 906-911 (1993)): PMS symptoms

Negative studies:

- White et al. (*Complementary Ther. Med.* 8, 166-172 (2000)): reflexologists unable to diagnose conditions of patients
- Brygge et al. (*Respir. Med.* 95, 173-179 (2001)): asthma
- Tovey (*Br. J. Gen. Pract.* 52, 19-23 (2002)): irritable bowel syndrome

AURICULOTHERAPY

(based in part on G.L. Lapeer (1986) "Auriculotherapy in Dentistry," *Cranio* 4, 266-275)

Background

Based on folk remedy; developed in modern form by Paul Nogier in France in 1950's. Mapping of parts of the body to external ear - "Nogier's homunculus."

Practice and scope

Points on the ear (auricular points) are stimulated by various means to treat illness. Pathological auricular points located by measuring electrical resistance of skin

"When there is a pain problem involving a given area of the body, the corresponding auricular point is said to be 'reactive,' manifesting greatly increased tenderness and electrical conductivity as compared to the surrounding areas of the ear. It is also purported that in some cases, there are also morphological changes or discolorations at these auricular loci." (Oleson et al. (1980) *Pain* 8, 217-229)

Needle inserted and left in for 6 to 10 minutes, possibly rotated. Removed and replaced with semipermanent steel needle, with which the patient can administer self-treatment by turning a magnet.

Primary function is treatment of pain ("joint pain, neuralgia, migraine and other forms of headache and spinal column such as sciatica"). Also used for allergies, colds, sinusitis, "gastrointestinal or urinary tract problems, cardiac insufficiency, liver and gall bladder problems, endocrine dysfunction and conditions such as addiction, insomnia, anxiety, stuttering and depression which have a psychological component."

Critique

Auricular points vary in their location, susceptibility to detection, response to stimuli.

Dubious neurological relationships in the theory

Different neurological circuits said to be activated by clockwise or counterclockwise rotation of needles, which is inconsistent with how nerves work

As with hypnosis, distraction and relaxation can be useful in dealing with pain. Can these explain the apparent success of this technique? The patient focuses attention on the auricular needles rather than on the pain; in addition, the expectation that the treatment will bring relief may aid in relaxation.

Study of chronic pain (Melzack & Katz (1984) *JAMA* 251, 1041-1043) - no effect.

Characteristics of pseudoscience

Vague, unscientific terminology. Auricular points said to have high or low "energy levels." For these, use of silver or gold needles, respectively, are recommended because gold has a more positive oxidation-reduction potential.

BODYWORK

"An umbrella term for many treatments that involve touching, manipulating, and/or exercise of the body and, in most cases, supposed alignment of the body's 'energy field' or removal of blockages to the flow of 'energy.' Bodywork encompasses massage therapy, body-centered psychotherapy, and touch therapy. 'Touch therapy' and 'touch healing' are generic terms for the laying on of hands and its variants, including OMEGA, reiki, and therapeutic touch...Unlike scientific physical therapists, proponents recommend bodywork for many health problems beyond pain, physical dysfunction, and physical injury. Not all forms of bodywork are supernatural, but most are unscientific." (Raso, p. 117)

Rolfing - "...named after the originator, Ida Rolf, also known as structural integration. A form of massage claimed to lengthen, straighten, and balance the body in relation to the pull of gravity. Therapeutic effects and health benefits are supposed to result from bringing the head, shoulders, thorax, and legs into vertical alignment." (Stalker and Glymour, eds., *Examining Holistic Medicine*, p. 387) Some practitioners attempt to balance the body's "energy."

Polarity Therapy - "encompasses counseling, craniosacral balancing...'energetic nutrition,' guided imagery, polarity yoga (polarity exercise), and reflexology...Polarity theory holds that the top and right side of the body have a positive charge, and that the feet and the left side of the body have a negative charge. Thus, practitioners place their right hand (+) on 'negatively charged' parts of the client's body, and their left hand (-) on 'positively charged' parts." (Raso, p. 120)

Therapeutic Touch - see below.

Craniosacral Therapy - based on an alleged rhythmic movement of the brain and cerebrospinal fluid.

Principles (from Barrett (Quackwatch article)):

- Small cranial pulsations can be felt with the fingertips.
- Restriction of movement of the cranial sutures...interfere with the normal flow of cerebrospinal fluid...and cause disease.
- Diseases can be diagnosed by detecting aberrations in this rhythm.
- Pain (especially of the jaw joint) and many other ailments can be remedied by pressing on the skull bones.

However, the skull bones are fused so unlikely any effect could be produced. Practitioners may also press on the neck and sacrum. A review by the British Columbia Office of Health Technology Assessment (1999) concluded that there was doubt concerning "the existence of the underlying phenomenon being measured" and on "practitioner's ability to measure it." There was a lack of "valid scientific evidence that craniosacral therapy provides a benefit to patients." Controlled trials have shown that craniosacral therapy lacks *interexaminer reliability* (different practitioners determine different rhythms on the same patient).

Alexander Technique - "...a murky 'body/mind' method focusing on posture improvement. Proponents claim that maintaining alignment of the head, neck, and back lead to optimum overall physical fitness. They further claim that it is useful in the treatment of a variety of diseases, including asthma, hypertension, peptic ulcer disease, and ulcerative colitis." (Raso, p. 126)

General critique: most of these techniques involve concepts of "energy" that are inconsistent with scientific knowledge.

THERAPEUTIC TOUCH

Created by Dolores Krieger, RN, PhD, and Dora Kunz, a psychic "sensitive." Roots in the religious philosophy of *Theosophy*, which has some Hindu elements. Later Krieger shifted her justification for therapeutic touch to Martha Rogers' "Science of Unitary Human Beings," a pseudoscientific philosophy rooted in paranormal concepts.

Are tens of thousands of practitioners. Promoted widely among nurses. Estimated that it is used in 80 North American hospitals and taught in more than 100 colleges and universities.

Despite the name, usually does not involve actual touching of the patient.

Stages consist of:

- centering (practitioner enters meditative state)
- assessment of imbalances in patient's energy fields
- "unruffling," in which sweeping hand motions are used to smooth out the energy field, clearing out "blockages" and "congestion."
- treatment, in which energy is transmitted to correct imbalances

"There is currently a lack of consensus on the scientific mechanism to explain these therapies, but most therapists who provide TT or HT [healing touch] believe the mechanism for clinical effects involves a subtle energy, vibration field, non-linear electromagnetic energy, or spirit or vital force." (Kemper and Kelly (2004) *Pediatric Annals* 33, 248-252)

Said to be supported by some studies involving humans, animals, and plants. However, according to Clark and Clark in *Examining Holistic Medicine* (p. 294), "the current research base supporting continued nursing practice of therapeutic touch is, at best, weak. Well-designed, double-blind studies have thus far shown transient results, no significant results, or are in need of independent replication." More recent literature

reviews by skeptical groups in 1993 and 1997 confirmed this assessment.

Popularity may involve a desire to restore the traditional bedside nursing role in an increasingly technology-oriented medical enterprise, as well as empowerment of nurses vs. doctors by giving the former a unique role.

Magician James Randi issued a \$700,000 challenge (now increased to \$1.1 million) to anyone who can demonstrate the ability to detect "energy fields."

Experiments by 11-year-old Emily Rosa achieved wide publicity (Rosa et al. (1998) *JAMA* 279, 1005-1010). Therapeutic touch practitioners were unable to detect energy fields. While there were some flaws in this study, it makes the important point that proponents of TT have never scientifically demonstrated that they can even detect a human energy field, to say nothing of being able to assess its quality, manipulate it, and achieve healing.

AROMATHERAPY

Background

Used in many ancient Asian cultures

Recognized in France as a medical specialty

Employs *essential oils*, which are distilled from flowers, bark, roots, or other plant material

Recommended by some doctors, as well as chiropractors, massage therapists, psychotherapists, cosmeticians

Essential oils marketed by cosmetics companies. Aromatherapy sales estimated at \$100 to \$300 million per year.

Principles

"The sense of smell directly accesses the limbic system, where all the emotions lie...It directly accesses the hypothalamus, which is the main switchboard of the body, controlling the neurochemical and hormonal regulation of the body. It directly accesses the frontal lobes, which control memory and attention, and the sense of smell accesses the reticular system, which basically integrates mind and body." (J. Douillard, as quoted by B.A. Krier, *Los Angeles Times*, "Aromatherapy: Making Scents of Health")

"The oils are alleged to contain hormones, vitamins, antibiotics, and antiseptics and to represent the 'life force,' 'spirit,' or 'soul' of the plant" (Barrett (1994) *Skeptical Briefs* 4(1), 7, 16).

Burns et al. (see below): "Essential oils contain many terpenes, which are rapidly absorbed through the lungs and cross the blood-brain barrier. In addition, may possess cholinergic activity or act on γ aminobutyric acid receptors."

Practice and scope

Inhale scents, or massage oils into skin, to treat medical problems. May be massaged at a location (e.g., in the spine) allegedly corresponding to the problem. Aromatherapy candles popular.

Said to be especially effective for psychosomatic or stress-related disorders, to facilitate relaxation, etc.

Eucalyptus inhaled to open sinuses

Other claimed benefits: fighting of infection; healing wounds; elimination of toxins; body toning; mind sharpening, improved memory; opening of lungs; promotion of circulation

Practitioners can be "certified" or "accredited" based on correspondence courses, weekend seminars, etc. Thousands have completed such programs.

"Aromatherapists almost always use essential oils as an adjunct to more traditional types of therapy such as massage or acupuncture. It's almost impossible to find someone who treats exclusively by olfaction, which makes it difficult to assess aromatherapy's true benefits." (N. Handel (2003) *Los Angeles Times*, June 15)

"Raindrop Therapy" - essential oils are dripped on the back and massaged into the skin. Allegedly corrects curvature of the spine.

Critique

Relatively little published research in medical journals. A meta-analysis (Cooke & Ernst (2000) *Br. J. Gen. Pract.* 50, 493-496) concluded that "aromatherapy massage has a mild, transient anxiolytic effect...the effects of aromatherapy are probably not strong enough for it to be considered for the treatment of anxiety. The hypothesis that it is effective for any other indication is not supported by the findings of rigorous clinical trials."

Burns et al. (*BMJ* 325, 1312-1313 (2002)) reviewed three trials from 2001-2 and concluded that aromatherapy may be effective in managing behavioral problems in dementia. (The studies used lemon balm and lavender oil.)

While link of sense of smell to emotions and memories is recognized, relationship of this to healing is unclear.

Attributes to a particular oil the benefits that might come simply from its method of administration (e.g., massage or warm bath)

Benefits described in vague and pseudoscientific terminology (e.g., "restoring harmony and balance," "driving out evil spirits")

Some oils applied directly to skin can cause irritation.

BACH FLOWER REMEDIES

Invented by Edward Bach (1880-1936) in England. Set of 38 highly-diluted plant preparations. Sun-warmed dew allegedly absorbs healing energy of plant. Used for psychological conditions. Based in part on *doctrine of signatures* (see handout on herbs). Scientifically unsupported. A trial of the "Five Flower Remedy" or "Rescue Remedy" for anxiety in students found no benefit (Armstrong & Ernst (2001) *Complement. Ther. Nurs. Midwifery* 7, 215-221).

SOME OTHER “HOLISTIC” APPROACHES

Amma Therapy - “an extremely specialized form of Massage Therapy that combines traditional Oriental Medical principles for assessing imbalances in the energy system with a Western approach to organ dysfunction.” (web site)

Anthroposophical Medicine - based on the spiritual/philosophical teachings of Rudolf Steiner (1861-1925), who split from Theosophy in 1912, and whose ideas are continued through the Waldorf schools. “Anthroposophically-extended therapeutics include herbs, minerals, and animal extracts either in tincture or in homeopathic dilution’s [sic]. Furthermore art (painting, modeling, movement, instruments) and color therapy, nutrition, meditation, baths, massage, external applications, and counseling are used” (letter from Physicians’ Association for Anthroposophical Medicine). Practitioners are MDs and ODs, and also use conventional methods. Generally opposed to immunization.

Naprapathy - blend of chiropractic and naturopathy. Licensed in Illinois.

“NEW AGE” HEALING AND “ENERGY MEDICINE”

Background

Definition of "New Age": "New age-ers seek to remake the world and lead it into a millennial 'holistic era' characterized by inner peace, wellness, unity, self-actualization, and the attainment of higher consciousness - in short, by fashioning a 'new planetary culture'." "Mankind, the planet Earth, our solar system, or perhaps even the entire Universe has somehow found itself in a special place in time; at the cutting edge of our movement into a new age" (J.S. Levin and J. Coreil (1986) *Soc. Sci. Med.* 23, 889-97).

Some aspects of "New Age" culture: channeling, environmental awareness (extended to regarding Earth as a living organism), alternative music and art, Eastern religions and practices (especially meditation), alien beings, crystal power, astrology, healing lifestyles, out of body journeys.

Teachings said to be based on ancient wisdom, either in traditional form or readapted for modern times

Proponents of “**energy medicine**” and “*subtle energy*” claim to deal with forms of life energy not recognized by science.

Practice and scope

Extremely heterogeneous in healing methods. Includes healing through mental and spiritual means (meditation, visualization, “distant healing”); laying on of hands to transmit “life force” or “energy” (e.g., Therapeutic Touch); and other techniques (aromatherapy, crystal healing, color healing (see below), acupuncture, acupressure, reflexology, iridology, applied kinesiology).

“...often the silliest beliefs are marketed in the language of junk science. The New Age is replete with talk of vibrational energies and such things as quantum synchronicities. The New Age has a love/hate relationship with science, abhorring its tradition of critical thinking, skepticism and doubt...but appreciating its power to rationalize apparently mysterious phenomena.” (W. Kaminer (2005) *Free Inquiry* 25(2), 26-30)

“*Medical intuitives*” use alleged psychic powers to make diagnoses.

Association for Research and Enlightenment and other followers of *Edgar Cayce* (died 1925) promote remedies based on his health-related psychic “readings.”

Characteristics of pseudoscience

Use of undefined "energy," "life force," etc.

Only anecdotal evidence for many of its claims

Inclusion of nonscientific (religious and philosophical) concepts

Other points

Duerden (*Complement. Ther. Nurs. Midwifery* 10, 22-29 (2004)) has described how phenomena associated with the visual system can be misinterpreted as perception of an aura.

CRYSTAL HEALING

Background and theory

A "New Age" technique employing crystals (usually quartz). Magical properties of crystals recognized in folklore and legends from ancient civilizations.

Crystals alleged to have special powers because of their perfect structure; able to "resonate," transfer "energy," etc. to interact with toxins causing disease and to remove them; or to correct energy imbalances; or to focus and amplify thoughts.

Powers are claimed to involve piezoelectric properties of crystals (ability to produce electric current when stressed)

Practice and scope

In addition to influencing mental states, emotions, etc., crystals are said to be able to promote healing of a wide variety of diseases, including cancer and AIDS.

Ceremonies are performed in which crystals are placed on, or passed over, afflicted parts of the body, or on special points similar to acupuncture points.

"Before the power of a crystal can be unleashed by a 'healer,' it must be energized, cleaned, and grounded. To charge up a crystal, some authors recommend a wide variety of methods: placing it in the sunlight or moonlight, burying it in sand, putting it under running water or under a waterfall, or in ocean waves or rushing wind. Simply anything that makes you energetic will make your crystal energetic." (Okulewicz, *Skeptical Inquirer* 13, 417-421 (1989)). The crystal may be "programmed" by implanting a positive thought or wish (e.g., for healing).

Critique

Fantastic claims unsupported by scientific evidence.

Claims made on behalf of crystals are often vague and sometimes contradictory

No known "energy" or force which crystals can transmit to the body. While piezoelectric effects are proposed,

the relatively impure natural crystals will not generate any piezoelectric current under conditions used in crystal healing.

Crystals do not generate energy on their own.

No known mechanism by which such interactions could effect health.

Characteristics of pseudoscience

Nonscientific applications of scientific terminology - energy, vibrations, harmonics, electromagnetic fields, bonding, resonance. Crystals said to project "energy fields," but no indication of what type of energy or how it can be detected.

Proponents show ignorance of basic principles of geology and mineralogy.

Associated with other metaphysical and pseudoscientific concepts and practices (e.g., astrology, psychic phenomena, applied kinesiology).

REIKI

A "New Age" technique with Oriental roots. "System founded in late nineteenth-century Japan by Mikao Usui (1802-1883), a Christian minister and Zen Buddhist monk...The term 'reiki' refers both to 'spirit energy' and to a method that is largely a variant of aura balancing and the laying on of hands. In *The Reiki Touch: A Reiki Handbook* (1990), 'reiki master' Judy-Carol Stuart describes the 'energy' as 'pure God-force' that 'flows from the universe into the crown chakra, the throat chakra, and the heart chakra, then out the arms and hands.' This 'love healing force,' she continues, 'has divine intelligence and will seek its own path in discovering and fulfilling the body's requirement.'...The method involves touching parts of the body and 'brushing' its alleged 'aura' with the hands. The apparent aim is to transfer 'universal life force energy' and thus effect healing and harmony." (Raso, *"Alternative Healthcare": A Comprehensive Guide*)

From P. Miles and G. True (*Altern. Ther.* 9(2), 62-72 (2003)):

It should be noted that the vibration accessed in Reiki arises from non-dual primordial chi, or Tao, as distinguished from the bioenergetic level of chi stimulated by therapeutic acupuncture.

Hands-on Reiki treatment is offered through light touch on a fully clothed recipient seated in a chair or reclining on a treatment table...A full treatment typically involves placing hands on 12 positions on the head, and on the front and back of the torso. Hands can be placed directly on the site of injury or pain if desired, but the treatment is neither symptom nor pathology specific. When even light touch is contraindicated, as in the presence of lesions, the hands can hover inches off the body. A session can be as short or as long as needed, with full treatments typically lasting 45 to 75 minutes

Reiki is believed to rebalance the biofield, thus strengthening the body's ability to heal and increasing systemic resistance to stress. It appears to reduce stress and stimulate self-healing by relaxation and perhaps by resetting the resting tone of the autonomic nervous system. Proponents of Reiki believe this might lead to enhancement of immune system function and increased endorphin production.

One Reiki book includes instructions for treating various diseases, such as brain damage, cancer, and diabetes.

Allegedly can be performed at a distance ("absent healing").

COLOR HEALING

"Treatment involving light, food, clothing, and environment, based on the belief that colors have wide-ranging curative effects. 'Color therapists' claim that cures result from correction of 'color imbalances.' Many hold that the seven colors of the spectrum correspond to the seven major chakras ('energy centers' of the body)." (Raso, p. 179) One mode is to treat the body with appropriately colored light to alter its "aura" or "vibrations." Others involve visualization of appropriate colors interacting with body or being breathed in.

Critique

No evidence for such an "aura," or that it can be altered by light; for chakras; for relationships of colors to physiology or healing

Light will not penetrate far below the skin, and thus could produce only localized effects.

KIRLIAN PHOTOGRAPHY

High-voltage electric fields can generate images of objects on photographic paper, surrounded by interesting halos or "auras." Sometimes performed on fingers or hands to diagnose diseases or deficiency states. However, the patterns depend on factors such as pressure and humidity, and can be produced using inanimate objects; they have nothing to do with biological "energies."

RADIONICS

"Use of instruments or inanimate objects to detect, magnify, store, or control alleged psychic and healing energies" (Butler, *A Consumer's Guide to "Alternative Medicine*, p. 205). May use a specimen, such as a lock of hair or blood sample, for analysis. Scientifically invalid.