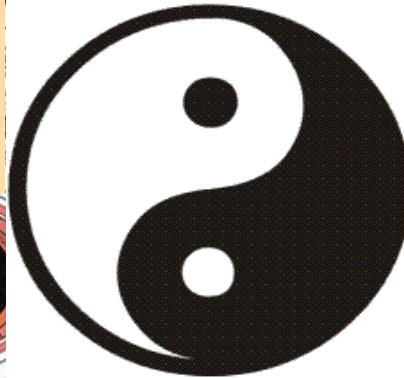
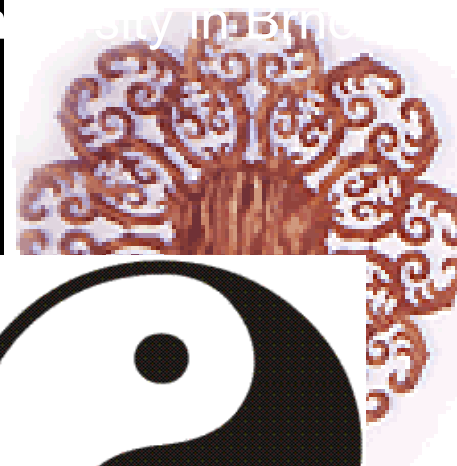


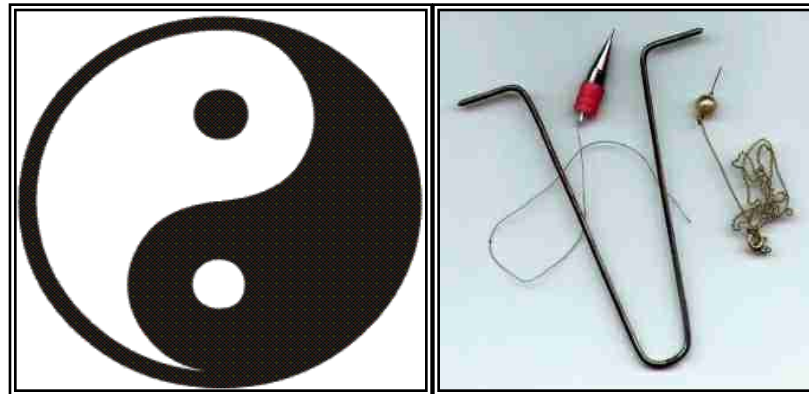
Lectures on Medical Biophysics

Dept. Biophysics, Medical Faculty,
Masaryk University in Brno



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Alternative (complementary) medicine

(as seen from point of view of doctors and natural scientists)

Definition

- Term „alternative medicine“ (AM) has a contradictory character – according to some doctors AM is not medicine at all, according to others it is not alternative but a regular part of medicine itself.
- From a practical point of view AM is mostly healing and diagnosing using methods which conflict with those used in medical science. AM even does not frequently consider its results, rejects or misinterprets them.
- AM is often called additional, non-orthodox, natural, non-conventional, non-western, non-scientific or not verified, sometimes, medicine of mind and body or even new medicine. But none of these names is accurate because most of them were invented according to emotional, cultural or ethnic circumstances.
- Sometimes we can distinguish between alternative medicine and complementary medicine. In both cases the same methods may be used, but in the former these methods are supposed to substitute evidence based medicine (EBM), whilst in the case of the latter, the methods are considered to be in addition (complementary) to EBM.

Inhomogeneity of AM

AM is based on different ideas or systems of beliefs which are incompatible with each other. For example, homeopathy and ayurvedic medicine are in disagreement, as also are homeopathy and the so called allopathic (EBM today) medicine.

Nonscientific character of AM

Example: unclear definition of “energy”

- In the context of AM we have to mention word “energy”. In many cases we cannot say if the proponents of AM are using this word figuratively (energy is equal to “vitality”) or if they are trying to invent some sort of measurable quantity. In AM, energy is not usually defined. According to AM, energy means a lot of things, from good mood to something radiant. But energy is not radiant fluid, which can be transferred from one human to another.
- In AM we can usually encounter the term *negative energy*, which is supposed to be the cause of disease. From physical point of view, energy is not positive or negative in relation to humans. The same kind of energy may be positive as well as negative according to its amount. Even special “natural” and “cosmic” energies do not exist as well as energies specific for biological systems. In AM is often said that such a specific vital form of energy exists - *od, orgon, Mesmer magnetism, prana, chi* etc.

Effectiveness of AM methods

- AM methods “work” someway.
- They act as placebo and in some cases even through material agents (osteopathy, chiropractic, massage, some herbs and others)
- Some AM methods can have non-specific adjuvant effects, others psychological, or act as placebo.
- Scientific literature is very poor on quality scientific articles which would try to prove specific effectiveness of AM in diseases (which are not merely psychosomatic).

Patient's motivation

(in incurable diseases at the moment, or in general):

- Dissatisfaction with „inhuman“ medicine (the patient is e.g. appendicitis case)
- Doctor does not have enough time to hear patient out
- Relative cheapness of some AM methods
- In other case demonstration of high income, „flaunting“
- Religious or philosophy of life reasons
- Bad experience with some doctors
- Recommendation by acquaintances
- Specifically in Czech Republic „effect of banned fruit“
- In the case of terminal diseases one tends to attempt any method which provides hope for survival.

Doctor's motivation

- Next to the economical reasons doctor may be also motivated by effort to help the patient maximally.
- Unfortunately, there are many doctors which consider AM methods to be the best, these often do not accept any rational arguments against AM methods considering them to be invectives of „academic“ medicine.
- We cannot rule out that some doctors use AM for their own comfort.

Economical view

- Money return in AM in US reaches several tenths of billions of dollars per year. This number also includes selling of different herbs and food supplements. More than half of patients are using these services. The number of appointments at AM facilities is bigger than the number of appointments at doctors applying EBM.
- AM yields a significant profit also to pharmacists and producers of preparations, devices and tools.
- Patients (consumers) of AM are exposed to gigantic 'advertisement pressure' which can, in case of food supplements, claim almost anything. They have so vast a list of 'indications' that they seem to become panacea – a cure for all.

Ethical view

AM involves a major ethical problem, due to several reasons:

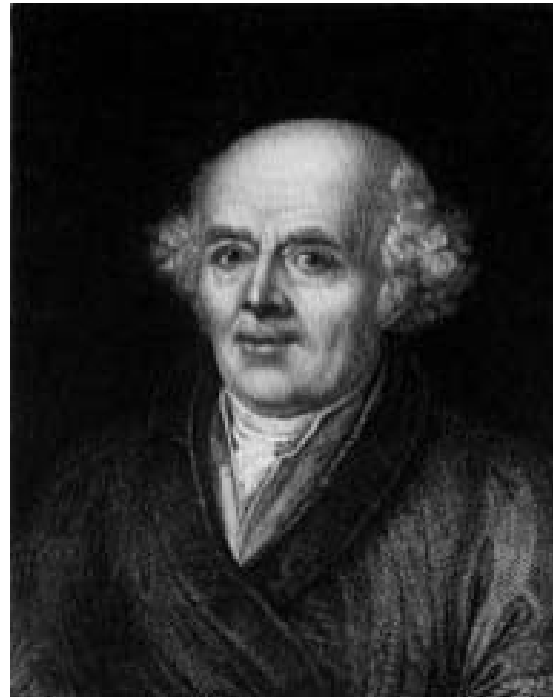
- Doctor is bound by Hippocratic oath to provide help to patient, as effectively as possible and to avoid methods which effectiveness is questionable or zero.
- Nevertheless the doctor is required to decide whether to recommend AM to patient or not, if questioned. In the case of dangerous methods his attitude may be negative but in a case of harmless methods it can be positive.
- Doctor's positive attitude, however, may lead to loss of trust in case of patients who consider AM methods as charlatan or are refusing them. At the same time it can be seen as support for healers providing AM.
- If the doctor will inform the patient about the principles of some AM methods, then he will probably eliminate their placebo effect. If he/she informs about this method incompletely or falsely, his/her good reputation is at risk as the patient will seek complete information somewhere else.

A rational way out is consistently refusing or reserved attitude of the doctor to AM, accompanied by effort to maximally amplify the placebo effect of EBM.

Selected AM methods

We can omit methods which, as a rule, do not have the goal to heal causally severe diseases: Silva's method, holotropic breathing, vitamin therapy, enzymotherapy, manipulation methods like chiropractic, osteopathy, so-called kinesiology, so-called reflexology, even though they have non-scientific basis.

Homoeopathy



Samuel Hahnemann (1755 -1843)



Homoeopathy

Alternative medicine



➤ Hahnemann's medicine system was introduced at the beginning of 19th century.



➤ Principles: "similar healed by similar" and "infinitesimal dilution"



➤ A substance producing the same symptoms as a disease is used in high dilutions to cure this disease. Gradual dilution is accompanied by shaking (agitation, „dynamization“) and denoted as potentiation.



➤ Therapeutic efficiency of high dilutions (e.g. 1 : 10³⁰) is very questionable as there is probably no molecule of effective substance in the remedy (it can be e.g, graphite, lime of burnt shells, siliceous sand or any herb extract).



➤ Some homoeopaths try to explain the therapeutic efficiency of absent substance. Hence they speak about „information tracks“ which proliferate during dynamization of the homoeopathic remedy. Is it possible that they are left in the water structure? Are they stable in time? Is it possible to remove the molecule of diluted substance from water and preserve the „information tracks“ at the same time? Cavitation (formation of oscillating bubbles accompanying turbulent streaming of water) is only mechanism which can cause some chemical changes in agitated water.



Cluster medicine (Cellhelp)

- An organic substance taken from patient's body (excrement, pus etc.) is burnt to ashes. Diagnosis is determined from crystals formed in the ash solution viewed through a microscope – different diseases should be related to different types of crystals or crystalline textures. No evidence = pure clairvoyance.
- The remedy is called dot – it is water distilled from ash solution.
- The therapy is harmless but the diagnosis is absurd. The whole procedure is very expensive – about 1000 € or more.

Iris diagnostics

Alternative medicine



<http://www.volny.cz/m.gil/>

as seen from point of view of doctors and natural scientists

Acupuncture

Acupuncture invokes thousands years old Chinese tradition and its relative efficiency in some painful complaints and psychosomatic problems. Several conflicting acupuncture systems exist (classical Chinese, Korean, simplified Chinese, Western).



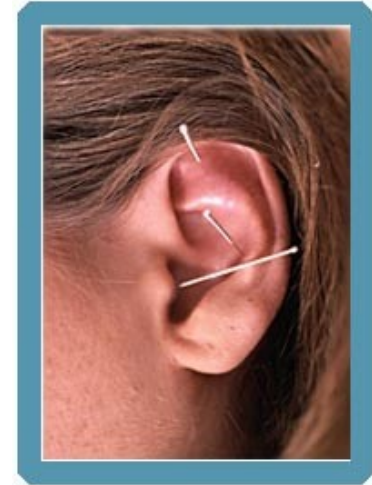
It is not possible to argue scientifically against classical acupuncture which is substantiated on the basis of competing principles yin and yang.

A rather different situation arises when the acupuncturists start to look for a way how to join the acupuncture and modern evidence based medicine.



Acupuncture

- In the epidermis and subcutis, there are many receptors and nerve fibres which can be stimulated and in this way influence some physiological functions (viz segmental body arrangement, viscerocutaneous and cutaneovisceral reflexes). The existence of so called trigger points in muscles on which it is possible to reduce pain by needle puncture, has been proven. Acupuncture based on this knowledge has some rational roots, however, it is necessary to verify them.
- No specific morphology has been discovered, which could be attributed to hundreds of would-be existing acupuncture points, or to the so called meridians (arrays of acu-points). Even the measurement of lowered electrical impedance in some spots on the skin, is no evidence for the acu-points.
- The so called auricular acupuncture and some other „microsystem“ acu-punctures should be refused as fully non-scientific.



Acupuncture

- The acupuncture has placebo effect as well as non-specific effect (attention-distracting, reflex or endorphin) in some painful complaints, even though little significant in comparison with “sham” acupuncture in double-blind randomized studies. It can be accepted as an adjuvant method in treatment of pain and nausea. It has no value for causal therapy. In principle, the same we can say about related acupressure and electroacupuncture.

Electroacupuncture after dr. Voll

On the basis of questionably measured impedance characteristics of the „acupuncture point“, an electric impulse is formed, which should have specific therapeutic effect. The respective devices are denoted by abbreviation EAV, or called segmentographs. This method is used also for suitability testing of homoeopathic remedies or the so-called "nosodes" (it is homoeopathic remedy prepared from pus, pathogens necrotised tissue etc.). The examined person holds in his/her hand, for example, a glass tube with a homoeopathic remedy or nosode. The electric response in an acu-point is evaluated and suitability of the remedy tested in this way. This remedy can be even simulated by electric impulses generated by a PC!

Electroacupuncture after dr. Voll

Device for EAV - MERITEST® 707B



Acupressure

- The treatment consists of the application of pressure on certain body points for pain relief and strengthening the immune system. According to the proponents, this procedure „releases energy accumulated and blocked in certain places in the human body. The use of deep fine-pressure of fingers or acupressure device (image) on the specific points can release energy blocks in the body and energy can flow and allow the body and the mind to relax“.



Psychic healing

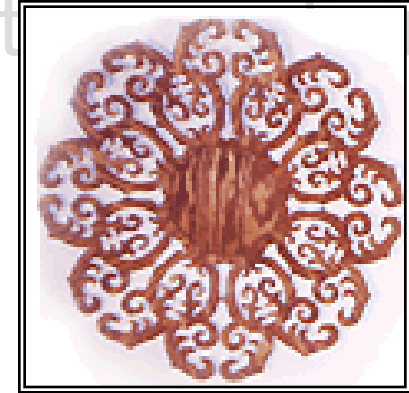
- Healing procedures operating factitious energies, often denoted as magnetism or biomagnetism, in which an emitter-receiver is the healer. Psychic joined with healing in connection with, for example, „measurement“ and „shielding“ of the so-called pathogenic Earth's zones, the existence of which, however, was never proven. Nevertheless, many devices are produced and sold for this purpose.
- Some psychic healers shake down “harmful energy” from the fingers, remove it by candle flame or wash it off after the healing procedure. They often use a small pendulum which they ask for right diagnosis. The patient can be examined also by “automatic drawing“, so-called Kirlian photography and/or by different clairvoyant or even astrologic methods. To concentrate the healing “energy”, talismans in the form of the Cheops pyramid, or Celtic, Egyptian and Christian symbols are sometimes used.

Psychic healing



Methods based on the allegedly healing force of gems, noble metals and propolis (used as part of a talisman) appear in psychic healing. It encompasses also so-called distant healing (by prayer, e.g., individually or in mass media). A Czech company, for example, owns emitters of healing bioenergy, which can act at a distance but only on persons equipped by a well paid receiver (it looks like a credit card). Such a therapy is often called “bioresonance therapy”.

Psychic healing



- Biogenerator of Dagmar Poláková is carved wood and acts against Earth's pathogenic zones.
- Successful action of psychic healers can be explained by suggestion. The main problem is definitely absence of energy, which would positively affect the patients or put the pendulums in motion without being measurable by means of any physical, chemical or biological method.
- Among the psychic healers we can encounter some very irresponsible ones, which do not hesitate to make a profit from recommendations like to stop radiotherapy or chemotherapy of cancer, even though it may lead to the death of the patient. The transient feeling of wellness, which can appear after discontinuation of anticancer therapy, is passed off by such healers as a result of their therapy. Prices paid for these „diagnoses“, „advices“ (often in form of expensive booklets) and herb teas can reach thousands of €.

Trance psychosurgery



In the last decade of the 20th century, the mass media enthusiastically informed us about the so-called Philippine or Brazilian trance psychosurgeons. They either by hand or by some workshop tools allegedly removed some pathological tissues from patients' bodies, including tumours, without leaving behind themselves any wounds or scars. Despite the well known fact that the human hand cannot pass through any tissue without damaging it, huge number of people believed it and made a journey to Philippines or Brazil. The "removed" tissues were several times taken away from the healers and revealed to be tissues of animal origin.

as seen from point of view of

Extreme nutrition systems

Extreme diets consumed to improve health, or to lose weight, in most cases ignore real biological needs of the human organism. Fictitious ideas are put into peoples' heads, which are based on naïve or religious beliefs, ignorance or bad understanding of biology. Besides **macrobiotics** (raw as well as cooked vegetable food, cereals, pulses (legumes), nuts, no meat as a rule – philosophical fundament is the yin-yang equilibrium principle), which can induce lack of vitamins or proteins, these diets are namely:

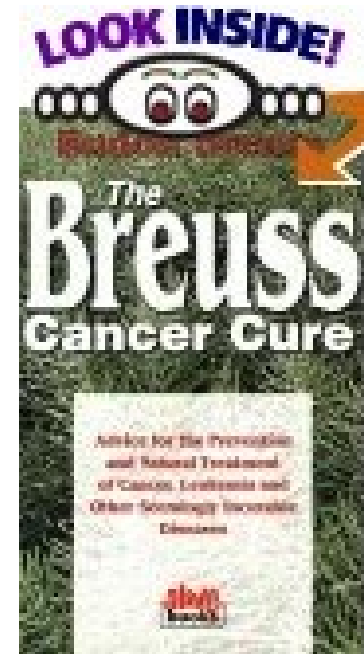
Diets with the would-be **living enzymes**.

Vegan (vegetarianism with exclusion of any animal proteins) and **fruitarian diets** (fruits are the main food) – cause lack of some amino acids, vitamins (B 12), or iron, respectively, if they are not consumed in special food supplements.

Consumption of urine – **urine therapy**. The nitrogen waste products present in urine should replace the nitrogen of proteins. The proponents of urine therapy compare it to homoeopathic remedies, because it contains traces of substances arising in various diseases.

Extreme nutrition systems

- **Cleansing diets** – in combination with enemas. All diseases of our body are explained on the basis of accumulation, fermentation and decaying of waste products present in body. Special attention is paid to the cleansing of the large intestine (*colonics*). For example, the bacteria merely live in accumulated waste, and actually do not harm the body.
- In cancer patients, the so called **Breuss cancer cure** (diet) became very popular – it is healing by hunger and vegetable juices. The **Gerson vegetarian juice diet** is very similar – only caffeine enemas and consumption of raw calf liver were added. Calf liver was replaced by beet juice recently.



Alternative medicine and oncology

Many remedies with would-be anticancer effect are offered to people suffering from cancer. We mention only the most important of them:

Iscador – produced from mistletoe. This remedy was, in principle, adopted from the R. Steiner's so-called anthroposophic medicine, inspired by the mystic idea of mistletoe as an „animal-plant“. Some immunomodulation properties of lectins present in mistletoe were described recently but no anticancer effect of lectins has been proven yet.

Laetril - Amygdalin, glycoside obtained from bitter almonds. No healing effect was proven after extensive testing. Nevertheless, there is still demand for this remedy.

Ovosan - Phospholipids from chicken embryos or eggs, and sunflower oil in gelatine capsules. The phospholipids have been tested in clinical studies, but their anticancer effect has not been positively proven yet.

Alternative medicine and oncology

Chelating therapy – A mixture of a synthetic amino acid EDTA and heparin, lidocaine, minerals and big doses of vitamins. The chelating therapists also prescribe orally administered pancreatic enzymes, extracts of thyroid glands, estrogens, iodine and fibre. These substances may be advantageous to patients, but it has not been proven yet that this therapy is effective in atherosclerosis or peripheral vascular diseases or even for life prolongation. Moreover, it has no effect against free radicals formed inside the body; on the other hand, it can increase their amount!

Ukrain – Remedy produced from greater celandine (*Chelidonium majus*) modified alkaloids. It should cause apoptosis of tumour cells without serious side effects on normal cells. It should also slow down tumour angiogenesis.

Alternative medicine and oncology

Cessiac, Yuccalive – These remedies should be administered simultaneously. They were taken from folk medicine of North American Indians. Yuccalive contains extract from *Yucca Schidigera*.

Shark cartilage – It should be anticancer drug reducing formation of blood vessel in tumours (angiogenesis) – it is reasoned by the fact that the cartilage is nourished without blood and lymphatic supply. The fibrous protein contained in the cartilage is considered valuable. Is it resistant to gastric juices and able to pass through the intestinal mucosa? However, the lack of effectiveness of shark cartilage does not mean that the anti-angiogenic drugs have no future in oncology. Thalidomide is one of these pharmaceuticals.

Other remedies recommended as anticancer drugs: ***mumio*** – a mineralised substance of organic origin, found in the mountains of Middle Asia, ***kombucha*** – a drink containing products of bacterial lactic and acetic fermentation, **hydrazine sulphate**, therapy by **living cells** (known from 30' of 20th century) etc.

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