

“Complementary and Alternative” Medicine – A Measure of Crisis in Academic Medicine

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Academic medicine integrates three of the most honorable human activities: treating the ill, teaching, and research. The quality that all three share is persistent quest for truth. However, there is reluctance of academic medicine today to openly defend scientific truth by challenging the arguments and the very existence of “complementary and alternative medicine” (CAM). There is no sound proof of CAM effectiveness, no hypotheses on the mechanisms of their action, nor scientific reports testing them. The fact that patients are charged for these “healing” activities makes CAM a plain fraud. With these facts in mind, the name “complementary and alternative medicine” is undeserved and misleading. CAM advocates maintain that CAM should be recognized precisely because it is widely practiced and very promising, that it has a special holistic/human approach, and works at least as a placebo in situations where medicine can do nothing more. As it seems that the public interest in paramedicine will only grow stronger before it grows weaker, scientists must raise their voice and question the truthfulness of CAM more openly. N of 1 randomized controlled trials (RCTs) should be used to test effectiveness of CAM, just as they are used to test any other treatment. Irrespectively of the noble principles of human rights and political correctness, academic medicine must discuss paramedicine equally openly and on the basis of the same criteria as it discusses its own activities, results, and plans.

Key words: *acupuncture; complementary and alternative medicine; human rights; political correctness; randomized controlled trials*

Whoever having undertaken to speak or write on Medicine, have first laid down for themselves some hypothesis to their argument, such as hot, or cold, or moist, or dry, or whatever else they choose (thus reducing their subject within a narrow compass, and supposing only one or two original causes of diseases or of death among mankind), are all clearly mistaken in much that they say; and this is the more reprehensible as relating to an art which all men avail themselves of on the most important occasions, and the good operators and practitioners in which they hold in especial honor. For there are practitioners, some bad and some far otherwise, which, if there had been no such thing as Medicine, and if nothing had been investigated or found out in it, would not have been the case, but all would have been equally unskilled and ignorant of it, and everything concerning the sick would have been directed by chance.

On Ancient Medicine
 By Hippocrates,
 Written 400 BCE
 Translated by Francis Adams (1)

Contemporary academic medicine may have its problems (2), or may even be in a crisis (3), but we must always keep in mind that it is one of the greatest

human achievements. It integrates three honorable human activities: treatment of the ill, systematic teaching, and rational research (4). Regardless of a burden it may present to a physician (4) and even contribute to the crisis of the profession (3,5), academic medicine requires special sort of people who can respond to extraordinary high demands. The qualities a person needs to face these demands are many, from diligence, devotion, and humanism to intelligence, endurance, and above all – morale, in the broadest sense of the word. Morale is indispensable in treating patients, teaching students, and doing research.

Academic Medicine and Truth

In all three activities of academic medicine, the required morale primarily implies the devotion to truth, which also includes openness and sincerity. We search for truth in diagnosing a disease and treating patients, in knowledge and attitudes we transfer to students, and in research data acquisition, analysis, and interpretation.

Scientists are aware that scientific truth is imperfect – it is human (6). But they continue to reveal it, through great efforts and many obstacles and mistakes, aware that the truth is never final. That is why scientific conclusions are only tentative. That is why they always must be testable. A common denomina-

tor to all scientific conclusions is the statistically calculated probability that the observed (difference) could have been a product of chance. Scientific truth is reached by the consensus of competent experts (7).

Two facts stand firmly in face of all imperfections of scientific work. The first one is that science has profoundly changed our everyday life, from food production to extension of human life. The second one is that at any given moment scientists know the difference between right and wrong, between what can and what cannot be done. Evidence-based medicine concept (8) is the consequence of this medical certainty and a product of permanent advancement of medicine according to the rules of science.

Academic Medicine and Politics

Rightfully and decisively, scientists keep politics and religion out of their world, as politics often overrides or misuses scientific proof, and religion neglects it. However, new social concepts enter the arena of human life every day and science, either unprepared or afraid, seems to be reluctant to face them. Political correctness and human rights concepts, for example, have affected modern medicine (9) without its adequate response (10). The fact that scientific truth is changeable and reached through argument leading to a consensus gives room for suspicion. Some people question specific scientific paradigms as well as very foundations of science, either by maintaining that "science itself is insecure" or by insisting that their "vote" be considered in consensus building (11). A person to whom we do not dare to deny expertise may thus, on the basis of the consensus principle, endlessly thwart the birth of a new paradigm, or undermine the existing one.

The concepts of political correctness and human rights have become so sacred that they inhibit academic medicine to speak openly about and confront alternative and complementary medicine (CAM). Otherwise, what is it that prevents us from saying openly that some centuries-long traditional medicine of a great culture is clearly outdated, futile, and even damaging? Is it possible that only a few dare to tell eager students of medicine that they should stop dwelling over acupuncture (12,13) and instead deepen their understanding of membrane potentials? Is it possible that only few have courage or honesty enough to say openly that 99% of healthy diets are just vanity of the rich (14)? These facts are known to every learned medical worker, but it seems that discussing the relationship of human rights and political correctness with science has become as unpleasant as discussing the relation of science and religion in Middle Ages.

"Complementary and Alternative Medicine"

The activities called "complementary and alternative medicine" (CAM) are culturally shaped (15) and thus very heterogeneous (16,17), which makes them difficult to address as a single issue. Although most of them are not accepted as official medical treatments (18), they are widely practiced and accepted (19) among both the patients and the doctors (20). CAM is surprisingly widespread and still prolifer-

ating (21) despite the lack of any sound proof of its effectiveness (22). Furthermore, there are no hypotheses on the mechanisms of action of CAM, nor the proposed mechanisms can be scientifically tested (23-25).

Unproved but practiced, unintelligent but aggressive, useless but charged, CAM is waiting for academic medicine to confront it. The due encounter should deal with the following problems concerning the CAM.

Problem 1: Evidence

There is practically no scientific evidence for the effectiveness of CAM (11,15,17,20,22,26,27). Given the rising faith in it and its use (19,21), there should be some evidence in favor of CAM. The absence of evidence is surprising because its documentation would significantly contribute to the professional success of CAM practitioners.

Problem 2: Name

The name "Complementary and Alternative Medicine" (21) suggests that the practice of CAM can be complementary or an alternative to scientific medicine. However, it is, at best, misleading. Until the effectiveness of CAM is proven, these attributes are undeserved.

Also, the word "conventional", often used as a name for scientific medicine, is not appropriate. There is only one medicine, and thus there is no need to call it conventional. After all, in this context, the term "conventional" carries a slightly derogative connotation.

We should call "medicine" all substances and procedures which experts recommend for treating diseases, based on the scientific evidence reported and published in peer-reviewed medical journals. Everything else belongs to and should be called "paramedicine" (28). Practitioners of the so-called "Complementary and Alternative Medicine" ought to document the effects of their treatments and publish their results before they can claim to practice medicine.

Problem 3: Fraud

Although there are no proofs of CAM's therapeutic effects, patients who seek and receive CAM treatment are charged for the service. Such a transaction is a sort of fraud, and should not be overseen either by the science or by the law. If CAM practitioners cannot provide proof of the effectiveness of their service, they basically cheat patients out of their money. Moreover, they are depriving them of faith in the best medical treatment they could have – however unsatisfactory that treatment may be (20).

Problem 4: Blurring the Picture

There are at least four arguments that advocates of paramedicine (CAM) use to discredit application of scientific way of thinking to CAM.

1. *Attraction vs rejection.* The proponents of paramedicine often complain, explicitly or implicitly, that medicine is prejudiced to CAM (29). However, the very essence of medicine is to be open for new treatments: to improve human health by finding new treatments is what has shaped medicine from its be-

ginnings. Medicine is in favor of CAM treatments just as much as it is in favor of any new, yet undiscovered pharmacological, surgical, biotechnological, or any other treatment. It would be a great achievement to use, for example, acupuncture as a means for alleviating chronic pain, as an anesthetic tool for surgery, or as an aid in quitting smoking (11). It is not true that medicine rejects new or old treatments out of hand, regardless of how peculiar or intellectually awkward they may seem. What medicine requires is the proof of their effectiveness (27). The strict ways of proving have been well known for centuries and are followed by thousands of scientists every day.

2. *Physician vs patient.* Patients have the right to choose any kind of treatment they want. However, the mere attraction of patients to paramedicine is neither a proof of its effectiveness, nor the reason for its application. Physicians are in a different position: they are required to administer only the therapies that have been proven effective. Expertise in effective treatment is, after all, the most important measure of physician's competence. In the times of evidence-based medicine (8), not a single physician, let alone lay person, should treat any patient without consulting sources that offer respective evidence and evidence-based advice. Moreover, if the evidence gathered and integrated at the global level show that some treatment has no effect, who should dare to apply it? (And charge for it?)

3. *Potential vs real effectiveness.* Somebody's belief that a paramedical treatment may potentially be effective does warrant research into that treatment (11), but does not warrant its application and certainly not charging patients for the service.

4. *Holistic/human approach vs charging.* Paramedicine often emphasizes its "holistic" or "human" approach in the treatment of patients (25,29). Although it is a seemingly reasonable approach, without proof of its effectiveness, it is nothing but naïve. After all, charging patients for treatment that has no proven effectiveness cannot be called – human.

Besides, it is unclear in which aspect(s) CAM is more holistic than medicine, and what the term "holistic" actually means in medical sense (29).

Problem 5: Where Are the Hypotheses?

Paramedical treatments are mostly supported by irrational hypotheses on the causal mechanisms behind their alleged effects or do not use hypothesis at all (30). For example, the "meridians" proposed within the framework of acupuncture practice (11) are absent from anatomy and physiology textbooks. Why? Is it discrimination by the science, or lack of respective proofs? Research cannot be done without hypothesis (1), and hypothesis should be founded on the existing knowledge (6,7).

There is some basic research into the causal mechanisms behind CAM treatments, but they are far behind the CAM's clinical application. Also, this research is mostly inadequate and poorly performed (29), probably because well-trained investigators are hesitant to do research without rational hypotheses. The concept of a meridian would, for example, allow

for experiments on animals that could bring out the causal efficacy of acupuncture (11). Still, such experiments are neither performed nor cited (11).

Problem 6: Placebo Effect as Excuse

It is often claimed that CAM can be used as a placebo, especially when "conventional" medicine cannot do much anymore (28). However, is it so? Firstly, it is questionable at which moment medicine really gives up. This should not be mistaken (as is often done) for inevitability of disease, disability, and death. Secondly, using CAM always deters patients to some extent from medical treatments, especially when they are unpleasant. Thirdly, although some advocate it strongly (30), placebo cannot be used as a mode of treatment (27). It has variable effects, if any, and affects patients' subjective symptoms, not the pathophysiology of disease. Fourthly, placebo use always implies lying to the patients. Although a form of a lie that the patients may not recognize was seriously considered by Brown (31), lying is not acceptable in medicine. One reason is that lying would be technically impossible, especially in the era of evidence-based medicine, where patients can find relevant information on the Internet as easily as physicians. The other reason is Hypocratic morale (Besides, if, by some chance, placebo proved effective and entered the realm of accepted methods would the lie become a routine medical method?). The third reason is informed consent, the patient's right to know what therapeutic possibilities are available. Finally, the use of placebo, which may be effective in a (relatively small) proportion of patients with a given disease, would require that all "treated" patients be left without the real treatment, ie, receive only placebo. To use Brown's example (31), if placebo was effective in 30% of patients with moderate hypertension, then all patients (100%) would be deprived of effective drug therapy. Thus, to let the 30% react to placebo, we would still have 70% of patients intentionally left without treatment. Not only that it would be unacceptable, but who would dare to charge patients for placebo treatment?

Problem 7: There is More from Where It Comes From

Paramedicine goes far beyond chiropractic, acupuncture, and holistic approaches to cancer treatment by macrobiotic diets (15-17). Cases that are not only contrary, but insulting, to common sense are numerous: TV shows in which "experts" treat cancer by waving their hands around a patient, the explanation being that energy ("bioenergy") emanates from the "experts" fingers, enters the patient's body, and allegedly cures the cancer! Or live TV shows where a healer in the studio uses a little pendulum to diagnose the problem for the person on the telephone line on the basis of chain movements.

Promotion of paramedicine is not only unwise, unlearned, and unscientific, but it is deeply anti-scientific and anti-intellectual, which means detrimental for culture and health care. The Di Bella scandal in Italy (32), when an arbitrary cancer therapy was proposed, and, under the public pressure accepted by

the government (and proved futile), illustrates how devastating the association of public pressure and anti-scientific behavior can be for the culture.

Academic Medicine and Paramedicine

If the crisis of academic medicine exists (2,3), it is not caused, enhanced, or precipitated by the proliferation of paramedicine. However, the tolerance that academic medicine shows towards paramedicine (12,13,19) may indicate its weakness, or crisis. Our reluctance to speak openly against the activities that endanger our patients and arrogantly insult our beliefs, including the very basic principles of our work, indicates our insecurity, carelessness, or – defeat.

When it comes to the question of scientific truth, democracy must yield to data and political correctness to honesty; need for pluralism should not blur the conclusions. If we believe in medicine, laws of science, and the value, honesty, and nobility of the world in which we work and which gives us the right to cut open patients' bellies, give them cytostatics, and drill into their skulls on everyday basis, we are obligated to tell the truth – there is no complementary and alternative medicine.

I believe that, in a symbolical way, the relationship of academic medicine to paramedicine will mark the depth of crisis in academic medicine – either because we do not believe in our knowledge, or we have forgotten it.

Telling the Truth

Women and men of contemporary Western civilization find it difficult to accept aging, disability, and death. With religion, which has lost most of its influence, and science, which demands more that the most conservative religion, paramedicine is the resort for all those who cannot face religious or scientific messages and demands. Paramedicine will continue to proliferate. This will automatically increase its pressure upon science to incorporate it or accept it within the world of rational thought (12,13,19). It will occur under the cover of tolerance, multiculturalism, human and patient rights, and respect for public opinion (19,21). Here, the scientists should defend their painfully built world of objectivity and honesty. In science, things are counted, measured, and weighted; statistical analysis protects reasoning from gross mistakes; and openness is the main tool for work. In other words, unless ready to accept scientific rules, paramedicine should not even be given a grace of dialogue. With respect to paramedicine, scientists must assume firm attitude and become more open, clear, and honest in their relation to the public (33).

Any paramedical activity advocated without the support of all available scientific reasoning and methods should be considered damaging and dangerous. Any paramedical practice charged to the patients should be considered fraud and grant adequate legal action.

Possible Compromise

A possible way to compromise I find in the recent type of clinical study design – the N of 1 randomized controlled trial (RCT). N of 1 study is performed

on a single patient with his or her informed consent, with treatments applied randomly, and in a double-blind manner (34-36). The sum of the results of all applications of a treatment is compared with the other, and conclusion on the effectiveness of the treatment – for the given patient – is drawn. This approach is not only suitable for the analysis of the effectiveness of paramedicine treatments, but could also be an acceptable form of therapeutic application of paramedical treatments. First, the patient self-empowerment would, rightfully, be both respected and put in function (19,21). At the same time, other patients, physicians, and even paramedicine practitioners would be protected by the very patients' right to choose the therapy regardless of the scientific facts, advice or advertisement, and – at one's own risk and expense. Second, the patient would have a direct and clear-cut insight into the effectiveness of both paramedical and medical treatments. This would bring about the desired triad (21) of *pluralism* (mutual respect for contrasting systems), *harmonization* (CAM and conventional medicine working together with no predetermined outcomes or biases), and *integration* (selective incorporation of elements of CAM and conventional medicine). Placebo effect of paramedicine (CAM), existent or not, testable or not, would be applied, sparing patients from missing to use (conventional) therapy, and sparing physicians (CAM therapists) from lying to patients.

Instead of a Conclusion

With great conviction, I predict that N of 1 RCTs, if ever performed, would reveal the ineffectiveness of CAM. Unfortunately, CAM practitioners will continue to refuse any kind of rational approach to their practice. In turn, we, academic medicine workers, should find strength to speak up for our patients, students, and beliefs.

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