Medical romanticism and the sources of medical practice

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Daniel Moerman is an anthropologist who has spent a career thinking about medicine and healing. He has written extensively on the placebo effect, and on the medicinal plant use of the Indian peoples of North America. He notes that most of the examples and cases in the current essay are derived from medicine in the USA, and that details may vary elsewhere.

Complementary Therapies in Medicine takes the view that systematic research is not the only way to deepen our understanding of health care. As such, we positively encourage the submission of papers that aim to express personal opinions or which describe personal experiences.

In November, 1997, I participated in an interesting exercise as a member of the US National Institutes of Health Consensus Development Panel on acupuncture. Our task was to attempt to reach a consensus on a series of questions regarding the efficacy of this oriental medical technique.

Through long deliberations, there was one refrain which came up again and again: several panelists regularly asked if there was clear and convincing evidence from well controlled randomized clinical trials (RCTs) of the efficacy of acupuncture. If there was not, they asserted, then we could not recommend acupuncture. Their argument was clear and convincing.

However, several other panelists, myself included, demurred. We thought RCTs to be an unrealistic standard against which to measure this medical treatment. Were that to be your standard, we attempted to argue, you would have to eliminate a substantial portion of contemporary medicine. Our argument, I thought, was fitful and incomplete, not well developed at all. In this essay, I want to develop that argument, and to consider the role of science, and scientific proof, in clinical medicine. My argument will be that while a scientific approach characterizes a good deal of medical research, a large portion, a preponderance, of medical practice is not scientific in origin and has no significant scientific basis or justification, or, even if it does have such a justification, that is not why it is done. Moreover, I will argue that in a number of cases, treatments with scientific justification are ignored in favor of less effective treatments. I do not conclude from this that these practices are inappropriate, ineffective, wrong, or dangerous, only that they aren't 'scientific.' And I will conclude, as I did at the acupuncture conference, that much valuable conventional medical practice can exist outside of a scientific framework. The argument may have application for complementary therapies, too.

The look and feel of medicine

Medicine looks like science. Doctors, even psychiatrists, often dress as if they are about to splash around in chemicals likely to eat holes in their shirts. I once observed a very distinguished senior professor of medicine enter the lecture hall 10 minutes late. He made 300 students wait another several minutes while he changed from his tweed jacket to his lab coat before beginning his lecture. The most toxic substance in reach was chalk, but he looked like a scientist.
Medical education is filled with science. In the USA, all students must score highly on the 'Medical College Admission Test' in order to be admitted to medical school. Students are allowed a total of 345 minutes to complete the exam. Eighty-five minutes are devoted to 'verbal reasoning,' and 60 minutes to a 'writing sample.' The remaining 200 minutes (58%) are split evenly between 'physical sciences' and 'biological sciences.' Apparently it is important that physicians understand levers, inclined planes, the acceleration of falling bodies, the life cycle of insects, and the process of photosynthesis.

A recent publication of the University of Michigan Alumni Association has a long article on recent events at the medical school, and featured a photograph of the dean helping a first year medical student 'into a white coat during ceremonies for students beginning their first year.' Note that the ceremonies did not include, say, a gift of books, the singing of hymns by a choir, or a visit to a hospice, but now the young woman looks like a scientist. Physicists and physicians often go by the same title: 'Dr Einstein,' and 'Dr Kildare.' The latter often seem more attached to these titles than the former.

There seems to me no more reason apriori that medicine should have the look and feel of science than should, say, engineering, architecture, agriculture, or the military. All of them draw on scientific principles on a daily basis. But only one dresses up like scientists.

'Only 20% … 'No, 83%'

What proportion of medical procedures have actually been subjected to scientific verification? Recently, people have rephrased this question, and have asked 'which portion of medicine is “evidence based”?' For many years, the standard citation has been to one or another of two reports on the value and importance of clinical trials published by the US Office of Technology Assessment, one in 1978, and one in 1983, where it was said that only 10–20% of current medical procedures had been subject to controlled study. That estimate had been derived from the work of epidemiologist Kerr White who got it from a study by Forsyth in 1963.

More recently, frustrated with the 'accusation' that only 10–20% of treatments were evidence based, David Sackett and colleagues attempted to show that this was not the case. Conceding that some medical procedures may not have substantial scientific justification, they essentially argued that the denominator should be changed, and that practices actually utilized in a general hospital were, indeed, evidence based; that is, their value had been established in at least one RCT, or there was other convincing evidence of effectiveness (note that this was the approach of Forsyth, too, who was not measuring all medical procedures, but common ones in daily practice). They concluded that 82% of their practices were scientifically sound, and the remainder were not bad, either. White's comment on this, that 20% may be a bit low, and 83% is probably too high, seems plausible to me, although given that this study was done at Oxford, one might well suggest that it is not representative of 'medicine.'

How much science is there in medicine?

I will not guess at a percentage, but will consider a few areas. It is a commonplace in the USA that a tremendous proportion of medical costs is expended during the last week or so of patients' lives. The wife of a friend recently died about 36 hours after sustaining a massive heart attack. The medical and hospital bills came to roughly $40,000. Yet there seem to be very few RCTs which address the sorts of treatments given to such older patients. This is probably true in part since it is hard to imagine how one might gain genuine informed consent from someone in the condition of my friend's wife. On what do physicians base their judgments, then, in cases like this? Most likely, they base it on their education, their experience, and the actions of their colleagues, that is, what we call 'clinical experience.'

There are other groups where similar situations occur. Infants, fetuses, and, generally, children are all regularly and widely treated by physicians. It is at least occasionally the case that drugs act differently in children than in adults (c. f., methylphenidate). It is as difficult to get informed consent from children as from the terminally ill elderly; it is impossible to get it from fetuses and babies. In the USA, regulations of the Food and Drug Administration are such that three-quarters of approved prescription drugs are explicitly labeled to state that they have not been tested in, and are not approved for, pediatric use. Many of these drugs are prescribed for children anyway; such so-called 'off label use' is quite legal, and probably often appropriate. It is not scientific, and such treatment cannot, in the strict sense of the term, be 'evidence-based.'

There are many other cases of off-label drug use, that is, where drugs are prescribed for patients on whom they have not been tested. A particularly challenging case is that of the 'mentally impaired.' The US National Bioethics Advisory Committee is currently studying the dilemma of this substantial group of people with significant medical needs from whom it is practically impossible to get informed consent, hence exceedingly difficult to study medication in a scientific fashion. But the lack of scientific study surely does not mean that these people are not being treated. Similarly, a recent American political debate has revolved around the charge that women have been routinely excluded from controlled trials. Insofar as this is true, and insofar as the physiology of women may differ from that of men, one may conclude that the use of drugs in women is unscientific. Again, it may not be wrong,
dangerous, inappropriate, or ineffective. It just is often not based on clear scientific evidence.

Other aspects of off-label drug use are also worth considering. Often, drugs approved for condition X are deemed subsequently to be effective for condition Y. Sometimes, the manufacturer will go to the trouble and expense to arrange for new labeling by the FDA (minoxidil, originally approved as an anti-hypertensive was relabeled for alopecia). But usually they do not (amitriptyline, approved as an antidepressant, is widely used as an analgesic). Such use is perfectly legal; the only restrictions are on the manufacturers which cannot actively market their products for these off-label uses. A more notorious instance, showing some of the dangers, is the case of phen-fen, the combination of dexfenfluramine and fenfluramine; widely prescribed for obesity, this off-label drug is now the subject of massive lawsuits after it was found to cause heart-valve problems in up to 30% of the patients taking it. It is very hard to know what portion of current USA drug prescribing is off label, but some suggest it may be as much as half, or more.

Perhaps the clearest case of non-scientific medicine comes from the world of surgery. It is, of course, hard to perform placebo surgery. There are, nonetheless, cases of placebo-controlled RCTs of surgical procedures. Not surprisingly, they occasionally indicate that placebo surgery is quite effective.9 Regardless, the reason that we do surgical procedures is because they 'make sense,' not because they can be scientifically shown to be effective compared to some sort of control. Even when surgical procedures are compared against one another (bypass vs. angioplasty, for example), the issues usually seem to revolve more around cost than around effectiveness. The several massive trials of the 1970s comparing bypass with medical care for angina seem only to have entrenched positions in what appeared to an outsider to have been a more turf battle than a scientific exercise in seeking the truth. I repeat, the fact that surgery (or any other branch of medicine, conventional or complementary) is not particularly scientific does not mean that it is bad or ineffective.

The famous American physician Karl Menninger was a strong believer in the value of 'horticultural therapy' for psychiatric patients; such therapy has been used at one time or another in a variety of inpatient facilities since the 1950s.10 How might one demonstrate scientifically that such practice was effective? One team actually tried this, but gave up as they were unable to design a control.10 What, one wonders, would 'placebo gardening' look like? Menninger said '(Gardening) takes the blinders off of patients and gives them a wider horizon'.30

There is no plausible way (or need) to test such a notion scientifically. It is a good idea, as might be 'fly fishing therapy,' or 'song therapy.' Much of medicine is like horticulture therapy. It is a reasonable and plausible way to attempt to help sick and disoriented people. But it is not necessarily scientific.

Finally, it has been estimated that in 40%–60% of patient visits to general practitioners there are symptoms but no abnormal physical signs,12 hence there is no diagnosis. A reassuring short conversation is often all that is needed in such a case; science is probably unnecessary.

All science is not good science

Even when medicine is scientific, the science is often bad. Anyone who has ever read any systematic reviews by members of the Cochrane Collaboration is aware of this. One recent review of antibiotics for a sore throat is typical.13 The authors examined all published studies they could find of sore throat treatment from 1946 to 1997. Of those, 29 were controlled trials of some sort; 11 of those were excluded for a variety of reasons. 'Many of the (remaining 17) studies were of poor quality. Only 11 studies were double-blinded.' In most of the 17, randomization was poor, or there were other serious design flaws. As is often the case, it seems as if the better the study's design, the smaller was the effect it showed.

In this case, meta-analysis showed that 'Antibiotics shorten the duration of symptoms ... by about 8 hours overall.' Given the side-effects, and population effects, of antibiotics, it is hard to imagine that a rational scientist would elect to treat sore throats with antibiotics except in most unusual and special cases. But of course it is done all the time.

Even good science can be confusing, even to experts

A recent study did a 'cumulative meta-analysis' of trials of treatments for myocardial infarction and compared the results with contemporaneous published treatment recommendations by clinical experts. Reviews often missed important findings, delayed reporting advances, and continued to recommend procedures shown to be ineffective or even harmful. The authors concluded that even the most sophisticated practitioners had a difficult time mastering the scientific literature in a timely fashion.14 Even if there is good science to be had, it is often hard to understand, and difficult to implement.

When science is ignored

While there are many such cases, where treatments are utilized without much scientific evidence, or good evidence is misunderstood, there are also interesting cases of clear scientific evidence being ignored, and of highly effective treatments being neglected. Perhaps the best recent case is antibiotic therapy for ulcers. The superiority of this treatment has been clear since the early 1990s; an NIH Consensus Conference gave the approach a ringing endorsement early in 1994,15 as have similar conferences in a half dozen other nations. Yet, in the USA
in 1995, only 5% of ulcer patients were being treated with antibiotics while 75% were being treated with antisecretory medications. In 1997, the Centers for Disease Control and Prevention and the National Institutes of Health launched a national campaign to educate patients and physicians about treating ulcers. For whatever reason, good science was being ignored. There are several reasons why antibiotic treatment may be ignored. First, the treatment is rather complicated; it is often called ‘triple therapy’ to indicate that there are three parts, usually two antibiotics combined with bismuth. Different experts recommend different combinations, and, to date, there are no handy combination drugs available on the market. At the same time, the antisecretory drugs are simple and quite effective, at least for a while; most patients don’t relapse for a year or so, and many don’t relapse at all. For whatever reason, many physicians are not following widely understood scientific principles in the treatment of ulcers. By contrast, note that the CDC did not have to launch a campaign to educate physicians or patients about Viagra.

There are other circumstances where the results of scientific investigations are inconvenient or embarrassing. Several cases come to mind: a recent study in Wales, which showed that men who had more orgasms lived longer than others, occasioned significant hilarity and a good deal of scorn from various medical authorities as reported in the press. The New York Times reported that two ‘scientists’ from London criticized the study saying ‘it would not take many cases of undetected heart disease’ to vitiate the findings; that is, if the scientific study had come out differently, it would have had a different result. This recalls the hand-wringing, Criqui and Ringel’s recent article in The Lancet is a classic case, which always occurs when another study comes along showing the health benefits of alcohol. For example, ‘Risk [of major coronary event] is lowest among men who report one to four drinks daily on 5 or 6 days a week and among women who report one or two drinks daily on 5 or 6 days a week.’ In another variations, this benefit is known as the ‘French paradox.’ Why it should be a paradox to a physician that a drug might enhance well-being is a paradox to me, Paradox or not, this is evidence of the nonscientific nature of much of medicine. Have you been advised by your physician to exercise? to lose weight? to eat less fat and more vegetables? to lower your cholesterol? to lower your blood pressure? to consume one or two alcoholic beverages a day? There is at least as much good scientific evidence to suggest the last as the former; but you are unlikely to hear it from your primary care physician.

**When medicine is not scientific, what is it?**

Medicine is often scientific, or at least is based on solid scientific principles: the case of polio vaccine, the first really big and important controlled trial, is an excellent example. Polio, a terrible scourge a generation ago (it killed my mother when I was a small boy), has been very nearly eliminated from the planet as the result of good science, good medicine, and good public health action.

But, I have argued, medicine often is not very scientific. What is it then? Is it in this context useful to think again about surgery. A surgeon may look like a scientist, and even talk like one. But the origins of surgery in the barber shop (which still displays the blood red towel in the barber pole) is, to me, more comforting. I know a lot of scientists. I am a scientist. Other things equal, I would rather have my boil lanced by a barber than by a cosmologist or biochemist; at least I can anticipate that he will be comfortable with a pair of scissors in his hand. Surgery is in many ways much more like hairdressing, or cooking, or sculpture than it is like science. It is a craft; it engages great dexterity and skill, and a subtle ability to visualize the unseen. Surgeons are renowned as men (term used advisedly) of action, not of words. Without offense, it does not require great insight or imagination to think that one might set a broken arm or remove a decayed or broken tooth. Indeed, there is evidence of chimpanzees removing the loose teeth of others using small sticks. This is not, as they say, rocket science. And without offense to other primates, I will have my teeth removed by a competent oral surgeon, someone with lots of experience. I could care less about his theories. There is good evidence that the mortality rate for open heart surgery is lowest in hospitals which do it most often, places like the Cleveland Clinic or the Mayo Clinic; the more they do, the better the outcome regardless of the fact that they probably also have the sickest patients. Practice makes perfect; that is not science.

Some months ago, I went to see my internist because I had been experiencing some uncomfortable arrhythmia. After I described my symptoms, he listened to my heart and lungs, took my blood pressure several times (it was a bit high) and gave me an electrocardiogram which appeared normal. He explained the beta adrenergic nervous system to me (‘It’s the part that gets you going when you’re being chased by a lion,’ he said) and that beta blockers slowed down that system. ‘We don’t know why the beta adrenergic system gets over stimulated. Medicine isn’t a science, really. But we have a lot of experience with this.’ He took some blood, prescribed a course of beta blockers, and told me to come back in a month. (Arrhythmia is much better, thank you.)

‘We have a lot of experience with this.’ Doctors and their healing predecessors, herbalists, shamans, midwives, bonesetters, diviners, etc. have been accumulating experience with human sickness and healing since at least the Middle Stone Age; a 60,000 year old Neanderthal burial at Shanidar contained pollen from a half dozen medicinal plants.
It is unclear that this record is a continuous one; the Flexner report, the 1910 report by Abraham Flexner which led to a major change in the organization of American medical education, making it much more science-based, like the contemporary German system, clearly disrupted a good deal of historical continuity. But, in the ensuring century, physicians working with their colleagues and patients have re-accumulated a store of knowledge by hook and by crook, by analogy and by experience, with which they attempt to ease sickness and pain. To suggest that this complex practice is all the result of ‘scientific evidence’ is clearly nonsensical.

The romance of scientific medicine

If so little of medicine is scientific, why is it that doctors insist so urgently that it is? Healers from the earliest days have acted to enhance their power. It is absolutely clear, dare I say scientifically proven, that the enthusiasm and conviction of physicians is a powerful element in the healing process (note that this is probably less central in engineering or architecture). ‘Science’ is a compelling source of power. In western culture since the early 19th century, the notion that the scientist has been on the boundaries of power has been a compelling one. ‘Mad scientist’ is, in some senses, redundant. All scientists have a bit of Mrs Shelley’s Dr Frankenstein in them. Power works. Science is powerful. If I look like a scientist, I will be powerful too. And the power affects patients, and can affect them for the better.

The medical romance with science may also help us understand why so many conventional physicians are so negative towards complementary therapies which generally do not have the same romance. Acupuncture is probably no more or less ‘scientific’ than surgery. But surgeons look like scientists while acupuncture charts look like antiques. At the same time, something like a ‘lancet,’ meaning a small lance – the name coming from the Middle English out of Old French – is pretty ancient itself. The OED’s first unambiguous citation is from 1474: ‘He dyed his vysage to be cutte wyth a knyf and lancetis endlong and overthwart.’ That this icon serves to name the leading medical journal of the world can not be for nothing.

Romanticism was a powerful 18th and 19th century movement against rationalism which admired nature, the primitive and the exotic. Great portions of medicine are not rational; they are romantic. The irony is that the romance is not with nature, or the exotic, but with the language and images of science. Medicine, occasionally scientific, is, as often, a scientific simulacrum. From those two entwined skeins comes much of the power of its fabric.

REFERENCES