



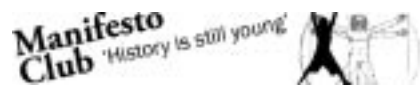
The Philosophical Surgeon **In Defence of Scientific Medicine**

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A Manifesto Club Thinkpiece

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About the Author

Michael Baum was educated at Birmingham University medical school where he graduated in 1960. He became a fellow of the Royal College of Surgeons in 1965, Master of surgery in 1972 and was awarded the gold medal of the International College of Surgeons in 1994. He has an honorary doctorate in medicine from the University of Gothenburg and is an honorary fellow of the Royal College of Radiologists. His lifetime interests have been in the diagnosis and management of breast cancer and evidence based medicine. These two interests were served when he established the first clinical trials centre in the UK at Kings College Hospital in 1980. He has served as professor of surgery at Kings College London, the Royal Marsden Hospital and the Institute of Cancer Research and finally at University College London.

Amongst his hobbies are baiting the proponents of screening and alternative medicine. He claims to be even-handed in his scepticism. He will be awarded the Galen Medal for Therapeutics at the Society of Apothecaries in 2008.



In short...

Good medical practice is founded on scientific evidence - particularly that yielded through the randomised controlled trial.

Scientific medicine is under threat. First, from the return of anecdote and intuition – for example, with alternative medicine treatments for breast cancer.

Medicine is also threatened by government intervention, which encourages medical practices introduced for spurious political reasons.

Patients have suffered from both of these developments. We need to revalue evidence-based medicine, and to call for politicians to keep out of medical decision-making.

The philosophical surgeon

There is an old joke doing the rounds of the cocktail-party circuit which runs as follows: A hostess introduces two strangers to each other, one a doctor and the other a lawyer. The lawyer goes on to say 'Oh so you're a doctor. I must tell you this screamingly funny story about a surgeon'. To which the doctor replies 'I think before you go any further, I ought to warn you that I am a surgeon'. Quick as a flash the lawyer responds: 'In which case I will tell it very slowly!' Once again the stereotype of the surgeon is reinforced as an unthinking technician, so that the very title 'philosophical surgeon' might be read as an oxymoron.

In defence of the thinking surgeon, it is the purpose of this Thinkpiece to emphasise that a modern surgeon practising evidence-based, humane and ethical medicine must have a sound grounding in some of the fundamental principles of philosophy. I shall illustrate these principles, drawing on 40 years experience as a surgeon within the National Health Service (NHS) and in particular my specialist practice in the diagnosis and management of breast cancer. I will then attempt to explain how government interventions imposed on our practice often have the opposite outcomes to those intended.

The epistemology of medicine

Epistemology is a bit of a mouthful that simply means the study or the theory of the growth of knowledge - or putting it another way, how is

it that we know certain facts to be true? At the most simple level our observations can be misleading, and so-called 'common sense' is no substitute for a systematic approach to the acquisition of knowledge. Primitive man 'knew' that the Earth was flat and that the Earth was the centre of the universe. For all intents and purposes it made little difference to the way of life in primitive communities, but these firmly held beliefs were false. The recognition that the world was round and that the universe was heliocentric rather than geocentric were scientific observations of seismic importance in the history of mankind.

All undergraduates should understand this period of history where the theories of Copernicus and the observations of Galileo changed man's status in the universe, and opened minds to a systematic pursuit of knowledge from the age of Enlightenment to the present day. The playwright Bertolt Brecht put the following words into the mouth of Galileo: 'It is not the purpose of our science to open the gates to infinite wisdom but merely to set the limits to the extent of our ignorance.' If that is indeed the case for the study of cosmology, which has little impact on the day-to-day life of even the most sophisticated communities, how much more so does it apply to our lives when facing their premature end under the threat of cancer or cardiovascular disease.

Inductive logic versus deductive logic

It was Aristotle and other great names of the golden age of Pericles in the ancient city of Athens who were the first to apply a systematic approach to the pursuit of knowledge. They recognised that our conceptual model of the world around us was a figment of our imagination, and it was therefore necessary systematically to collect observations to challenge this view. These observations were built up into a conceptual model (hypothesis), and later observations were selected to corroborate this model.

The process of collecting observations in defence of a hypothesis is known as inductivism. Inductive logic was considered 'science' up until

the eighteenth century, when the Scottish philosopher David Hume finally illustrated the poverty of the process. Perhaps the best way of illustrating the poverty of inductivism as it relates to our lives as medical practitioners is to consider the subject of *alternative medicine*.

When doctors attack alternative medicine or appear sceptical to its much-trumpeted claims, we are often accused of being bigots with closed minds, protecting a closed shop. Nothing could be further from the truth, but it has taken a layman, the late great John Diamond, to find the words to set the record straight. For that reason I would like to quote from his posthumously published book *Snake Oil and other Preoccupations* [1].

Diamond wrote: 'I am not an academic and this is not an academic book, even though the facts I list in it have a perfectly good scientific basis to them but when it comes to human motivation I am working blind. I can only guess why most people seem to prefer the unproven to the proven, the anecdotal to the rigorously demonstrated, and the so-called natural to the scientific.' There is much within that passage, on the nature of proof, the nature of the scientific method, and the use and abuse of anecdotal evidence.

The alternative practitioner can trace his roots back to Galen in the second century, and a metaphysical belief system based on the balance of *natural humours*. For example, Galen believed that breast cancer was due to an excess of *black bile* (melancholia). Inductive support for this belief came from the observation that breast cancer was more common in post-menopausal women than pre-menopausal women, and this was thought to be because the menstrual flux in pre-menopausal women got rid of the putative excess of black bile. The therapeutic consequences of this belief therefore were purgation and venesection (bloodletting). The inductive 'proof' that this approach worked were the anecdotes about women with breast cancer who were treated by purgation and venesection, and who lived for several years after diagnosis. Those who died were the victims of the blood-letting who didn't have the courage of his convictions, or the patient herself who lacked the constitutional vigour to sustain prolonged bloodletting.

There is a neo-Galenic doctrine, based on the view that breast cancer is indeed due to an imbalance of nature, only substituting *energy fields* for the natural humours. According to this view, to restore perfect health you have to restore the balance of these metaphysical *energy fields*. This might be achieved by acupuncture balancing out the Yin and the yang, homeopathy (*simularis simulabum curantur*), or strange balancing diets. The Gerson diet in particular is very fashionable.

In fact, one of my patients, seeking to improve my education, gave me a book describing this approach [2]. The first half of the book formulates the hypothesis why this strange diet should improve the balance of the immune system, and the second half of the book consisted of 50 anecdotes of patients with cancer, who were only given six months to live by the medical profession, and who took to the diet and lived for a long time.

The trouble with that kind of evidence is that although we know the numerator (50) we don't know the denominator - for example, 50 out of 1,000 cases treated by neglect could indeed live for many years while the indolent disease progresses on the chest wall. Furthermore, from the evidence available in the book some of the diagnoses were a little bit shaky and the author neglects to mention whether or not these patients receive conventional treatment at the same time as the magic diet. Finally, I know of no oncologist who gives a patient six months to live. We may say that the median survival for a group with advanced cancer is six months, but among this group certain individuals may lie at extremes of survival. These individuals are the substance of the anecdote.

Perhaps I should leave the last word on this subject to Robert Parks, author of the wonderful book *Voodoo Science*. Parks wrote: '*Alternative* seems to define a culture rather than a field of medicine – a culture that is not scientifically demanding. It is a culture in which ancient accretions are given more weight than biological science and anecdotes are preferred over clinical trials. Alternative therapies steadfastly resist change often for centuries or even millennia, unaffected by scientific advances in the

understanding of physiology or disease.' [3] If that is the case, then who are the bigots and the ones with the closed minds?

Deductive logic and the randomised controlled trial

The alternative to alternative medicine should be scientific medicine, not 'orthodoxy'. By science, I mean the application of deductive logic. The deductive approach starts with the formulation of the hypothesis, but for a start the hypothesis must be rational in its explanation of the disease process or therapeutic intervention. By 'rational' I mean built upon the growth of knowledge of human biology and physiology from the past 100 years or so, without invoking magic or metaphysical principles.

Even so, the new hypothesis is still perceived as a fictional account of reality and subjected to rigorous test by the design of experiments challenging the new theory with the 'hazard of refutation'. These experiments in medical or surgical therapeutics must have control groups treated by observation, placebo or 'best available therapy'. Without the control group we merely have a series of anecdotal reports. What I have just described is in fact a randomised controlled trial.

Breast cancer and the randomised controlled trial

As I have mentioned, up until the eighteenth century, if breast cancer was treated at all it was treated according to the principles of Galen. It wasn't until the mid-nineteenth century that it became widely accepted that cancer was a disease of cellular pathology originating within the breast and spreading centrifugally along the lymphatic system. The therapeutic consequence of this belief led surgeons to embark on radical surgery that involved removing the breast and all the regional lymphatics. It was left to William Halsted in the 1890s to refine the operation into the classic radical mastectomy, with the intention of ridding the body of the primary cancer and its lymph node secondaries. Sadly, the only support for this radical treatment was anecdotal. If the patient survived it was due to

the success of the surgeon. If the patient died it was either because the patient came too late or the surgeon lacked the courage of his convictions to complete a truly radical operation.

It was only when Dr Bernard Fisher in the 1960s challenged the conceptual model of the disease that progress started to be made. In other words an antithesis was constructed to challenge the prevailing dogma. Fisher taught that contrary to popular belief, breast cancer cells spread throughout the body through the venous drainage of the breast, and at the time of clinical presentation of the disease, the majority of breast cancers were in fact systemic disorders. If that was indeed the case then there are two therapeutic consequences. Firstly, that radical surgery is shutting the stable door after the horse has bolted. Therefore the role of local therapy is local control, which would equally well be achieved by breast-conserving techniques such as lumpectomy and radiotherapy. The second therapeutic corollary is that if indeed the disease is systemic at the time of diagnosis, then the only way to improve cure rates is through chemotherapy or hormone therapy.

However, the greatness of Dr Fisher, ably supported by surgical acolytes all around the world, was not simply to accept a new set of beliefs in place of an old set of beliefs, but to challenge the new paradigm using deductive logic: in other words, through randomised controlled trials. One of the great success stories of modern medicine has been the painstaking series of randomised controlled trials in the management of early breast cancer over the past 30 years. We now know with extreme confidence that breast conservation is a safe alternative to radical mastectomy, although not in itself improving cure rates, greatly enhancing the patient's quality of life. We also know with extreme confidence that treatment using either endocrine or cytotoxic regimens will improve survival. The final demonstration of that truth has been the dramatic fall in breast cancer mortality in the UK and North America since 1985, following the first publication of the world overview of trials [4].

Using breast cancer as an example, we can demonstrate that the philosophy of science that underpins the randomised controlled trials

has led to the dramatic improvement in length of life and quality of life for women inflicted with this dread disease. However, this isn't the end of the story, as new biological hypotheses are being generated with new therapeutic consequences, all of which will be tested in the randomised controlled trial, which is now accepted as the most scientific and ethical way of conducting medicine in times of uncertainty.

The impact of government interference

For both political and humane reasons, governments of all persuasions like to meddle in this process and add guidelines, targets and unwelcome advice on top of our carefully collected evidence. Two good examples from the recent past illustrate the dangerous law of unintended consequences when well-meaning meddling is appliquéd on top of clinical science. These are: first, teaching the practice of breast self-examination (BSE); and second, applying the two-week target for the urgent diagnosis of cases suspected of having breast cancer.

BSE is superficially attractive in making it the responsibility of women themselves to 'catch their breast cancers early' and thus reduce breast cancer mortality. It's a good theory and was introduced as policy in many countries, and also provides an excuse for the women's magazines to publish photographs of beautiful young women fondling their own breasts (which in itself gives out the wrong message that breast cancer is a disease of young women). However, the important point to note is that the advice is based on an assumption not on evidence. Over the past 10 years, three large randomised controlled trials have compared the outcomes of women who have been intensively trained in BSE with a matched population of women left to their own devices. The outcomes of all three studies were counterintuitive. There was no difference in breast cancer mortality, but those women practising BSE were twice as likely to experience false alarms and unnecessary surgery. This prompted the Canadian Medical Association to issue a warning against the practice! [5]

A more recent example was the two-week rule. Primary care doctors

in the NHS were advised to prioritise women with breast symptoms as urgent or not urgent. Those in the former group had to be seen within two weeks and the rest could take their turn. Note the two false assumptions in these guidelines: a) breast cancer is an emergency and even a few weeks can affect outcome; and b) women with breast symptoms atypical of breast cancer can happily wait for up to 12 weeks. Pretty much as predicted, the law of unintended consequences kicked in. So many worried-well pushy middle-class women were seen as emergencies, and so many cancers appeared in the non-urgent group, that the net result was a greater delay in cancers being diagnosed than before [6].

Finally, I wish to illustrate the extreme folly of the two-week target for seeing patients suspected of cancer, with an anecdote about a patient I saw recently. The patient who attended my NHS clinic was a charming and sensible woman in her early 50s, with a family history of breast cancer. Three weeks before she had seen her GP complaining of passing bright red blood at stool. He referred her urgently under the two-week 'target' rule to the colo-rectal clinic. The referral was flagged up by some clerical officer in the audit department and the clock started its countdown. Since the colo-rectal clinics are overwhelmed with patients with lower bowel symptoms, nurse-led clinics were set up to take the pressure off the specialist surgeons. The nurse ticked the boxes and the patient was referred for colonoscopy. This examination showed haemorrhoids (piles), the commonest cause of bleeding at stool, and no signs of cancer. Her next appointment followed soon afterwards and she had a CT scan of her abdomen and chest. This was reported as showing a secondary cancer in her right lung. She was then referred for positron emitting tomography, which suggested that she might have cancer in her right breast not her right lung. Note that at no time had anyone actually examined her.

By the time she came to see me she was a confused nervous wreck. After taking a careful history I asked her to disrobe and sit up on the couch. One glance was enough to confirm the breast cancer from the dimple in the lower outer quadrant on the right side. Palpation and biopsy confirmed the diagnosis. After counselling at length she was booked for

the next vacant slot on the operating list, which was just over two weeks off. She went off satisfied, but the audit office was not. Apparently we were in breach of the two-week target for cancer.

So in the end, all these delays and unnecessary investigations wasted about £3,000, and caused substantial anxiety for the patient – and yet they passed the two-week target rule. At the point when the patient is diagnosed and treatment ordered, the computer finds that targets have not been met. This upside-down logic shows the unintended consequences of ill-considered and non-evidence-based political interference.

Conclusion

I hope those examples illustrate the dangers of government intervention in the practice of evidence-based medicine. This is what I choose to describe as ignorance-based interference (IBI). Other examples of IBI include so-called 'patient's choice', censoring the right of the National Institute for Clinical Excellence (NICE) to evaluate alternative medicine, and the constant 're-disorganisation' of the NHS [7].

My call to the government is this: provide us with the tools to practice evidence-based medicine and then *please* leave us alone.

Endnotes

[1] Snake Oil and other Preoccupations, John Diamond, Vintage Random House UK, 2001

[2] A Cancer Therapy: results of fifty cases and the cure of advanced cancer by diet therapy, Max Gerson, Gerson Institute Bonita, California, 1986

[3] Voodoo Science, Robert Park, Oxford University Press, Oxford, 2000

[4] 'Sudden fall in breast cancer death rates in England & Wales', Beral V, Hermon C, Reeves G, Peto R., Lancet 1995; 345:1642-3

[5] 'Is it time to stop teaching Breast Self Examination?', Nekhlyudov L and Fletcher SW, Can Med Ass. J 2001;164: 1851-1852

[6] 'Referral patterns, cancer diagnoses, and waiting times after introduction of two week wait rule for breast cancer: prospective cohort study', Potter S, Govidarajulu S, Shere M et al., BMJ 2007; 335: 288-90

[7] Hippocratic Oaths: Medicine and its discontents, Raymond Tallis, Atlantic Books, London 2004