

Is medicine a process of scientific rigour?

Medicine is an ancient art. This may sound incorrect. We all know that medicine is a science. But it very easily is not. There is far more alchemy and guesswork in the practice of medicine than there may appear to be to an outsider. It is far less limited by a scientific framework and rather guided by supposition and loose illogical thought than perhaps it should be, and hence – an art.

This is not how many doctors would see medicine. What is it that protects medicine from the judgements, whims and preferences of the artist – the writer or painter – who is entitled to put down on paper or canvas whatever they like? The answer is very simple – empirical thought. What is that? It is the basing of what happens next on what is understood purely by the analysis of observation. And in the case of medicine, and many other sciences, it is the observation of the individual and the recorded observations of many – which is research.

So, medicine is not an art. It is the rigorous application of detection and analysis and the comparison of those observations with previously established norms discovered by pure analytical thought to produce diagnosis and intervention.

But this seemingly scientific process moves towards art and away from the idealised rigours of science when the very basics of medicine fail.

What are the basics? We've already established that – observation. What does that mean in practical terms? At its simplest and most important, taking a history from a patient and examining the patient. These skills are fading. The simple skill of asking a patient how much vaginal bleeding there is and asking when the bleeding occurs and when it started may distinguish the small-volume bleeding of an ectopic pregnancy from a complete miscarriage, or an endometrial cancer from the small-volume bleeding of atrophy.

In the era of sophisticated tests, surely these tests replace the crude processes of history and examination – transvaginal ultrasound and endometrial sampling, in the examples above?

But tests can be wrong. Surely COVID has highlighted this for all who believe that tests are gold standards!

Ectopics and complete miscarriages may mimic each other in all tests except the history of the volume of bleeding. And genital tract atrophy may produce an 'inadequate for histological assessment' endometrial sample that correctly describes the presence of only blood and mucus without tissue, *provided that* the blood loss is minimal.

False positives and overdiagnosis are just as important. D-dimers are normally raised in pregnancy; a rapid plasma reagin test (RPR)

is frequently false positive for syphilis and can be cross-checked with other tests; free fluid in the abdomen postoperatively does not always indicate blood loss or infection, both of which are excluded by physical examination of the patient; and, yes, other tests *may* help if not misinterpreted.

In an era in which tests are replacing empirical assessment, medicine is not only losing its way but becoming unnecessarily expensive. And in research, the so-called rigours of scientific investigation may appear later to have been misguided research motivated by gain.

Enthusiasts are often supported in academic collaboration in their career-maintaining research by the very manufacturers whose results show small gains (at considerable cost) that achieve statistical significance, with the true balance of cost/benefit and quality of life achieved, or even evidence of real efficacy, emerging much later when actual experience questions so-called improved outcomes. This is not scientific rigour.

In an era of reckless expenditure, medical personnel sometimes seem blind to the risks of bankruptcy.

Science requires comparable reproducible outcomes. This may fail when statistics are massaged. It may also fail when the training in medical treatments is downplayed by those whose expertise is won at a cost in complications that rapidly appear among the patients of those less well trained – total laparoscopic hysterectomy may be an example. Lack of complete honesty on the part of those who have achieved expertise produces carelessness in those who follow. This is not scientific rigour.

Medicine is therefore dangerously prone to alchemy – the combination of inappropriate elements to produce gold. This 'art', alchemy, was a bizarre attempt to create something of great worth from the wrong constituents, and in retrospect is quite clearly a process utterly lacking in scientific rigour. We are better at judging this historically than in the present, better at judging others than ourselves. But it was ever thus.

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