

Demands and Challenges of Modern Medicine[†]

Pin Lim,¹*MD (Camb), FRCP (Lond)*

Abstract

Modern medicine, characterised by the enormous impact of rapid advances in science and technology, has vastly enhanced the doctor's professional capabilities and has made the practice of medicine more intellectually challenging as well as professionally satisfying. It has also made medicine more complex and demanding. In addition to having to keep pace with rapid medical advances, the doctor has to deal with 1) the issue of sorting the wheat from the chaff out of the deluge of new drugs and equipment presented to him, 2) the issue of rationing and determining priorities within the limits of finite resources, 3) the issue of appropriate response to new ethical challenges presented by the application of new technologies and 4) the issue of maintaining the human face of medicine in the context of growing presence and impact of technology. As doctors, we have the responsibility to ensure that through steadfast commitment to professionalism, through wisdom and insight we can harvest and maximise the vast potential of technology in caring for our patients. This is a challenge we must accept in the cause of our patients' welfare, the paramount concern of our professional creed.

Ann Acad Med Singapore 2007;36:698-701

Key words: Opportunities, Professional response, Technology

I am deeply honoured by the invitation to deliver the 16th Tun Dr Ismail Oration and I wish to thank the Master and Council of the Academy of Medicine of Malaysia for this rare privilege of addressing a distinguished gathering such as this, as previous illustrious orators had done since 1974.

The late Tun Dr Ismail, a fellow physician and an Honorary Member of the Academy of Medicine of Malaysia was a highly esteemed and respected leading political figure of his time, having left his mark on society in areas ranging from commerce and industry to internal security and home affairs, and culminating in being Deputy Prime Minister of Malaysia.

I believe his training and experience as a physician must have helped to equip him for his critical role in shaping the development of Malaysia, right from the beginning of its nationhood in the 1950s. Given his intimate understanding of medicine alongside his deep and passionate commitment to broad societal issues, a professional perspective of the interplay between medicine and society would have been close to his heart.

Modern medicine is characterised by unprecedented advances in medical knowledge, fuelled by the explosive growth in medical science and technology in the last few decades. The complete sequencing of the human genome,

with its far-reaching implications for medicine, unquestionably the most prominent of all landmark achievements in medical science, is a case in point. Its vast potential for prevention, diagnosis and treatment of all manner of medical conditions other than those due to trauma, if fully realised, adds immeasurably to what doctors can do for their patients. Such a prospect enhances the intellectual challenge and professional satisfaction of doctors and providers of healthcare.

Actually, growth in medical knowledge involves more than just science and technology. It clearly includes the slower and less dramatic, but no less important, accumulation and documentation of clinical experiences and wisdom by doctors themselves, who also play the key role in translating new scientific knowledge into clinical benefits in patient care.

One important consequence of this enormous influx of medical science and knowledge is the obligation for doctors to keep up with changes that come at an increasingly rapid rate. The by-word among doctors is continuing medical education (CME), which demands not just brushing up what we have previously learnt but, more importantly, both learning of new knowledge and unlearning of the obsolete.

The demand on doctors, however, does not just stop at

¹ Past Master, Academy of Medicine, Singapore

Address for Correspondence: Professor Lim Pin, Department of Medicine, Yong Loo Lin School of Medicine, National University of Singapore, 5 Lower Kent Ridge Road, Singapore 119074.

[†] This lecture was delivered at the 40th Malaysia-Singapore Congress of Medicine, 23 to 27 August 2006, Sunway Pyramid Convention Centre, Petaling Jaya, Malaysia.

learning. With enhanced clinical capabilities as a result of increase in medical knowledge and skill, the care of patients has generally become more intensive, complex and ever more clinically demanding. The consequent improved quality of patient care and clinical outcome constitute what society recognises as wonders of modern medicine.

Take the example of myocardial infarction. In the 1960s when I was a house officer, the standard treatment of this condition was 3 weeks' complete bed rest and simple symptomatic measures. These days doctors can consider a range of active interventions – from thrombolysis to angioplasty to bypass surgery, besides drugs such as beta-blockers, statins and ACE inhibitors. The length of stay in hospital is less than a week in most cases. The patient has clearly benefited from the improved outcome of modern medical management. It also means that doctors and patients' expectations have proportionately escalated.

As if this is not enough pressure on doctors, there is also the larger issue of availability of resources to apply the best available care for our patients. Societies are increasingly concerned about healthcare costs. The latter consumes a high percentage of the GDP in most developed countries (ranging from 10% to 15%) and is projected to grow annually at about 7%.

This trend, though somewhat moderated, is also evident in most other countries. Explanations are sought for this alarming escalation. Health economists and policy analysts have identified technological advance as the main cause of this growth, compounded in many societies by the needs of an ageing population. Spending on new technology has risen sharply even as the dollar price of technology itself has actually decreased, implying a very substantial increase in the use of such technology in patient care.

Cost containment has become a priority in most countries and the main thrust is directed at slowing the diffusion of expensive technology. This is to be achieved chiefly by placing strict limits on resources available to healthcare, in the hope that the quality of patient care will be preserved.

The above landscape that I have sketched briefly throws up many critical issues that we need to consider carefully. To start with, the emphasis on technology cost is seldom accompanied by a commensurate assessment of the benefit accrued. The latter admittedly is often not easily reducible to hard numbers for comparison, although attempts have been made to measure gain in terms of quality-adjusted life years, a crude measure at best. But even if clear proportionality between cost and benefit can be established, the ultimate arbiter in resource allocation is how much the country's policy-makers are prepared to spend on healthcare, in the context of other societal priorities. This is the immutable reality we have to live with.

Professionalism demands that we must always remain committed to the primacy of patient welfare. How can this mandate be reconciled with the need to work within such

resource constraint? To start with, we should never allow such constraint to dampen and diminish our interest in technological advances and their potential to benefit our patients. We should continue to strive to keep up with the latest advances.

A difficulty in keeping updated is to sort out the wheat from the chaff. Not all that is touted as new and better is necessarily valuable and useful. A good foundation knowledge of basic science certainly helps, but in practice it is not feasible for individuals to validate claims from the new drugs, equipment and instruments. This can only be properly and reliably carried out at the institutional level.

An excellent example of such an institution is the National Institute for Health and Clinical Excellence (NICE) of the UK. This is a government sponsored organisation tasked with independent assessment of medical technology. It receives suggestions from the public on which technologies to study, does a preliminary assessment, determines the scope of work and submits its proposals to the Ministry for Health. Upon approval by the Ministry, NICE will delegate the actual assessment to independent groups of experts, specially appointed for the particular purpose.

The experts' findings constitute the basis for formulating guidelines that can be confidently adopted by doctors in practice. This process is, however, limited by 2 factors. First, the number of technologies that receive assessment is necessarily limited by the availability of manpower and resources. Second, only those proposals from NICE that are approved by the Ministry will go on to full assessment. Interestingly, expenditure on technologies which have been endorsed by the independent assessors are entitled to public healthcare funding support. Despite its limited selective coverage, this service certainly helps to reduce inappropriate use of technology.

As for technologies that have not been scrutinised by institutions like NICE, one would have to exercise the best evidence-based judgment wherever possible. Meta-analyses of randomised controlled trials (RCTs) are useful. However, it is as well to bear in mind that RCTs are often supported financially by manufacturers of medical products. Such support is often acknowledged upfront in the publications, a laudable practice that highlights potential conflicts of interest.

Clinical research and RCTs, as in all research, are conducted on the basis of a system of honour and integrity. Strict adherence to the highest ethical standards of professionalism by doctors conducting such research contributes critically to ensuring the appropriate choice and use of new technologies by members of the profession in their practice.

Judicious choice and use of technology will enable doctors to maximise the benefits of new technologies within the constraints of resources and strengthen public trust in the profession. As we know only too well, the

powerful, effective but often costly clinical tools proffered by technology often put doctors in stressful moral and ethical dilemmas in a variety of clinical situations.

Perhaps the most difficult issue is that of rationing, in which only a proportion of patients who need a particular mode of new effective but expensive therapy can be given the treatment because of resource constraint. It goes against the grain of our professional commitment to the primacy of patient welfare. Often doctors have to decide which patients are excluded from treatment, an unpleasant task.

Ethical issues are also raised if, as some have recently suggested, severely-ill patients with very poor prognosis, who have exhausted all available treatments, are allowed to be treated with non-approved technology that is still undergoing clinical evaluation

The other ethically controversial area involving technology is encapsulated in the concept and practice of the Advance Medical Directive (AMD), in which the prolonged use of costly technology to keep the terminal patient alive, often highly stressful to both the patient and relatives, may be avoided by a conscious decision by the mentally competent patient in advance. The issue is whether withholding medical intervention under these circumstances can be ethically justified, even if the decision to withhold treatment is voluntarily made by the competent patient himself.

The arrival of genetics in clinical medicine also brings with it a train of ethical landmines. Genetic testing for heritable conditions, presently confined only to monogenic diseases, produces genetic information about the patient which is highly sensitive and has wide implications for relatives. Patients have to be counselled before the test that, if positive, the test results could affect his employment, insurance and even the prospect of finding a spouse, and that his relatives may want to know whether they carry the same disease gene so as to take measures to prevent the disease, if possible. The patient would require support and assistance, if the test is positive, to deal with the consequent issues and problems. Clear guidelines therefore need to be drawn up on how genetic information should be handled, especially from the point of view of protecting confidentiality and respecting patient autonomy.

As doctors we have the responsibility to work out an ethically sound and balanced position, draw up professional guidelines, and observe them in our practice. Other ethical issues in the context of in vitro fertilisation (IVF), which are likely to gain prominence in the future, are those related to pre-implantation genetic diagnosis for avoiding certain genetic diseases, pre-implantation tissue typing to provide treatment for sibling with severe illness, and the abhorrent possibility of pre-implantation genetic tinkering to produce designer babies. They are potentially explosive issues. We need to take special note of their far-reaching implications for society as a whole, beyond the ethics of medical practice itself.

Information technology, as we know, has already made a significant impact on our professional life. It has helped to diffuse new ideas and knowledge rapidly, calling attention to the urgent need to keep up. It has also facilitated learning, providing access to vast resources from the convenience of one's desk- or lap-top computers. It has even made substantial information and data portable through powerful hand-held computers and PDAs. Information technology has the potential of enhancing clinical practice through providing support for clinical decisions.

A good clinical-decision support system provides, at the point of care, the needed information and knowledge relevant to the patient at hand and helps in making optimal clinical decisions. In practice, however, it is still not easy to identify good decision support systems that can improve practice in a statistically significant way.

Implementation of an effective support system is also a challenging task that calls for a change in organisational culture, involving close collaboration between technologists and clinicians in a very complex process.

And the system is only as good as the database that supports it. The database should clearly be founded on evidence, which should continually evolve and be regularly updated to reflect the most recent scientific and clinical advances.

Overall, the role of IT in clinical practice is poised to grow, with the availability of greater computing power and more innovative software. Already many administrative tasks and functions in the hospitals and clinics harness the power of IT, ranging from filing and storing of case notes to drug prescribing, ordering and retrieving the results of laboratory tests and medical imaging. This should translate into greater efficiency and cost-saving not least from minimising medical and administrative errors. The limit of what IT can do is really set by our knowledge and understanding of the nature of the task concerned.

Can IT move from supporting decision-making by doctors to making clinical decisions themselves? This great leap would involve a thorough understanding and knowledge of the whole mental process involved in making clinical judgment, sufficient to produce a reliable simulating software. Our knowledge in this area is at best still rudimentary and incomplete. So it is still some way before computers can begin to compete with doctors!

The increasing role of technology in patient care has brought with it certain unintended consequences. The heavy dependence on technology has tended to eclipse the role of bedside interaction and clinical evaluation. The latter requires ample time, to take a detailed history and do a thorough physical examination, to communicate, to empathise and build a relationship with the patient. The present-day hectic clinical schedules militate against such an ideal. With the patient moving from one test to another, and the doctor organising and conducting tests (or chasing after results of the tests) at the expense of time with the

patient, especially in acute care, the expected powerful synergy between the clinical approach and technology is severely compromised. This trend may instead have led to excessive and inappropriate use of technology.

The other undesirable outcome is a diminution in rapport between doctor and patient, or even an absence of any meaningful relationship between the 2 parties. The role of the doctor degenerates into that of a motor mechanic repairing a car. Such a situation breeds suspicion and antagonism especially when things go wrong and dissatisfied patients are driven to seek recourse by taking the route of litigation. The fact that patients now have ready access to much medical information, albeit not all complete or accurate, and their increasing awareness of their legal rights, have worsened the growing litigious trend among patients.

One consequence of the litigious trend is the unhealthy practice of defensive medicine. The desire to protect oneself against any possible legal liability results in liberal and often indiscriminate use of technology, leading to wastage of precious resources and even harm to the patients. Communication, rapport, competence and, of course, the highest professional ethical standards are the only bulwark against this trend and its problems.

In the climate of concern with rising healthcare costs, where cost containment is a high priority of healthcare funders, we must continually examine our own practices, since the spread and use of new technology has generally been identified as the chief driver of escalating expenditure on healthcare. Professionalism dictates that we ensure that technology is used responsibly and cost-effectively. There is no question that, used in this way, technology has vastly improved the quality and outcome of care and has enormously benefited many patients. Perhaps this fact has not been sufficiently emphasised whenever the issue of cost containment is surfaced.

It is worth noting, however, that among the key strategies that health economists propose to contain cost is the promotion of competition among caregivers, touting schemes such as payment for performance and GP-based commissioning, in which money will follow patients to hospitals, which will then need to compete on the basis of accessibility, quality and efficiency.

Actually, the central role of a responsive and efficient independent technology assessment service cannot be over-

emphasised. Such evaluation would go a long way to provide objective information to support clinical decisions, to eliminate wasteful and inappropriate use of technology, and to ensure optimal spending on new technology.

Such an independent assessment service, to be comprehensive and timely, is an enormous undertaking in terms of resources and effort. Perhaps an international body, generously supported and adequately funded, should be set up and tasked with this critical role of sorting the influx of new technologies objectively, comprehensively and promptly, and helping to promote efficient, safe, appropriate and cost-effective use of technology.

Already several countries like Malaysia and UK have established their respective medical technology assessment programmes with varying scope and thoroughness. Some of them have actually taken the initiative to form the International Network of Agencies for Health Technology Assessment with much sharing of information and findings. This augurs well for the establishment of a truly effective and responsive international body to inform clinicians as well as healthcare policy-makers worldwide.

In keeping with professionalism, we on our part must not hesitate to self-regulate and rein in members who have failed to meet professional standards, including the judicious and responsible use of technology. We must regularly engage in objective internal assessment and be prepared to accept external scrutiny. This will strengthen public trust and may well convince policy makers that certain new costly technologies are actually better value for money, and deserve to be supported. The winners will be the patients.

The practice of medicine is, whilst increasingly demanding, also more satisfying for the contribution of technology. And society at large will need to draw on new cost-effective technology for the higher quality of care that an increasingly educated and informed public has come to expect. There can be no doubt that technology, used wisely, is a powerful tool that can take us to unprecedented levels of excellence in medical care.

We have the responsibility to ensure that through steadfast commitment to professionalism, discipline, wisdom and insight, we can harness and maximise the vast potential of technology in caring for our patients, even within resource constraints. This is a challenge we must accept in the cause of our patients' welfare, the paramount concern of our professional creed.