

Assuring quality in an age of rapid technological advance

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Can today's quest for innovation and efficiency in health care learn from the development of the laparoscope?

The first series of over 100 patients in whom laparoscopic examination of the abdominal cavity was conducted safely was reported in 1910 by the Swedish surgeon Hans-Christian Jacobaeus,^{1,2} although, another surgeon, Georg Kelling of Dresden, subsequently claimed, somewhat miffed, that he pioneered the procedure in two patients in 1902 using a cystoscope.³

However, it was not until the 1930s that laparoscopy was used to support diagnostic biopsy. John Ruddock, a Californian cardiologist who became fascinated with the technique, reported hundreds of cases in which laparoscopy enabled high levels of diagnostic accuracy for hepatic and gastrointestinal disorders.⁴

Things were then quiet on the laparoscopic front until the introduction, in 1982, of a computer-chip camera into the laparoscope that revolutionised its use by projecting visual information, previously perceived only through one eye atop the laparoscope tube, onto a television screen in the operating theatre.

First in France in 1988, then in the rest of Europe and on into the United States, laparoscopic cholecystectomy became a frequent procedure. The spread of laparoscopic cholecystectomy was "like a wildfire".⁵ Surgeons queued to be trained. Instrument companies went into overdrive developing laparoscopic equipment.

The demand from patients for this new procedure was intense. Strong competitive pressure drove hospitals to provide video facilities in operating theatres and expensive sets of laparoscopic instruments.

Conservatives called for trials to compare the new versus the old way of excising diseased gall bladders, but since the 1990s, laparoscopic cholecystectomy has been the treatment of choice for uncomplicated gall bladder disease.⁶

New medical technologies

The story of laparoscopy is unusual. New technologies usually give only incremental advances and require sophisticated clinical trials to establish their superiority. But like penicillin, laparoscopy just took off.

Interestingly, while clinicians were intimately involved in developing technological innovations a century ago, we now depend heavily on technologies that are not medical or surgical in origin. Whether it is discerning the distinctive genetic profile of patients to better tailor therapy to their responsiveness, as seen increasingly in cancer chemotherapy, or understanding the neurophysiological basis of behavioural disturbance through magnetic resonance imaging, we use technology that brings other professionals into clinical care.

Medical advance and medical costs grow in synchrony with medically informing technologies and new drugs. Medical technology allows for safer, faster execution of care, often by less technically trained personnel, yet unlike in other technology-based industries — microcomputing, motor vehicles — the prices go up, not down.

While much of the steady rise in the costs of health care over the past 40 or more years has been attributed to the ageing of the population, economic analyses provide evidence that it is technology that is the principal inflator of cost.⁷

Tackling rising costs

What business model, to use the jargon, do we medicos propose for contending with the rising costs of health care? Our job is first and fundamentally to fulfil our duty of care to individual patients. But when the expense of doing that eats into our capacity to fulfil our duty of care to other patients, we have a problem. What can we suggest be done?

These are the facts: first, we are forever improving our treatment of illness and injuries, saving lives and relieving suffering. Second, this is the result of progress in our technological capacity to do so, most often driven by advances in the sciences beyond

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medicine — think information technology and 3-dimensional printing of prostheses. Third, while we need policies to guide health investment, these require serious contributions of evidence and opinion from the medical and surgical professions.

Also required is a forthright acknowledgement that some advances that, at first pass, appear to offer great benefit end up falling short of expectations when subjected to greater evidence-based scrutiny. Recent high-profile cases, such as the roles of vertebroplasty⁸ and renal denervation,⁹ are salient examples of the fact that the reversal of established medical practice is common and occurs across all fields of medicine.¹⁰

Our learned colleges could lead the way here. Analyses of what works in health care and what doesn't requires clinical reflection, and the colleges have a lot of firepower to bring to bear. Other analyses into ways to reduce the undesirable consequences of medical and surgical interventions, such as wound infection, also require professional leadership if they are to improve clinical practice.

The Choosing Wisely campaign in the US is a partnership of dozens of national organisations representing medical specialists and health care

consumers working with the American Board of Internal Medicine Foundation “to help providers, patients and other health care stakeholders think and talk about overuse of health care resources in the United States”.¹¹

This campaign has provoked the development of similar efforts in Australia, one sponsored by NPS MedicineWise,¹² and a parallel “EVOLVE” initiative led by the Royal Australasian College of Physicians (RACP).¹³ They offer opportunities for the medical profession to lead the quest for more efficient care so that, with the resources saved, we can continue to innovate in the tradition of the development of laparoscopy. As Nick Talley, president of the RACP, said at a recent meeting of EVOLVE, clinicians can either lead — or wait to be led.

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