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Editorial

We can, but should we? The place of new technology in ophthalmology

It is possible, as a treating clinician, to prevent most glaucoma blindness armed with only a slit-lamp – including a tonometer and the usual diagnostic lenses (gonioscopy and stereoscopic fundus) – a decade-old standard automated perimeter, and perhaps a colour disc photograph; deploying currently established therapies.

There are developments available, such as optical coherence tomography (OCT) of the retinal nerve fibre layer and anterior segment OCT, for example, and new minimally invasive glaucoma surgery procedures, but it is legitimate to debate whether these technologies affect rates of ultimately vision-threatening glaucoma, and whether they are a necessary – as opposed to discretionary, marginal or even unhelpful – component of routine clinical care. It can certainly be asserted that they ought not to be standard care for all patients.

Ophthalmology, perhaps foremost among medical specialties, is populated by advanced technology in both diagnostics and surgery. Many of the new technologies are indisputably exciting and fascinating, a culmination of years of quality science and research.

By what criteria should one judge these technologies and their utility? That a technology exists does not make its use necessary, nor is questioning the applicability of new innovations the mark of antediluvian thinking, but rather is, at the very least, a necessary counter to the siren song of industry marketing.

It is axiomatic for industry to commercialize technology and market it, and to create new markets where none exist. We should neither be surprised by this, nor expect otherwise, as shareholders seek a return on investment. There is no requirement to delay the seeking of this return until quality evidence of utility is available.

Part of the marketing is to persuade prospective users that this is the 'new standard of care', and – now ably assisted by the internet – to insinuate into a patient's consciousness the notion that a failure to deploy these techniques represents some sort of clinical neglect. Boosters of some credibility are engaged as 'key opinion leaders' to disseminate information to health practitioners. The size, reach and sophistication of this enterprise have been multiply documented.[1,2] We are surely entitled to appropriate and transmogrify the term 'military-industrial complex' to conceptualize a similar 'medical-industrial complex'[3]: (recall that the former term was coined not by a paranoid, pacifist loon but by General and then President Dwight D Eisenhower, a commentator of unchallengeable insight).[4]

Scepticism in evaluating new technologies and therapies is vital to ensure that we are not manipulated by a combination of marketing, peer pressure and patient demand into using tests or treatments for which a rigorous evidence base does not exist.

The refrains from colleagues will be unsurprising: 'Surely more tests will ensure that I don't miss anything?'; 'As a clinician, isn't my primary responsibility to the individual patient under my care?'; 'The costs are not my responsibility: it is for the health economists to work out how to pay for it'; 'I have to offer these tests and treatments to differentiate my practice'.

A plot of blindness prevention yield versus testing costs in our glaucoma environment can be imagined as a horizontally asymptotic graph, with greater and more sophisticated testing yielding ever smaller increments of vision saved, reaching 100% only at infinity. Much as we might like to fund curiosity, vision-threatening glaucoma will, in the vast majority of cases, declare itself with typical visual field loss in good time. It is not necessary to see with an annual automated retinal nerve fibre layer analysis every nerve fibre lost in an elderly ocular hypertensive. Neither will AS OCT showing any meridian of angle susceptible to closure necessarily contribute to prevention of angle closure blindness. Yes, it might

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be nice to know (and exhilarating to deploy the latest gadget) but who should pay for that?[5]

It is, on the other hand, very necessary to prevent functional vision loss occurring within the lifetime of the patient, and it is impossible to trivialize the transformative advance that OCT technology – our emblematic example – has provided in some arenas. Macula OCT is seemingly an indispensible tool in judging response to treatment in age-related macula degeneration despite current lack of reimbursement.[6] Similarly, in idiopathic intracranial hypertension, OCT may be vital in monitoring the state of the retinal nerve fibre layer when papilloedema has yet to resolve.[7]

We may applaud and be grateful for the cleverness of technology while reserving the freedom to choose those aspects that may truly alter decision making or clinical outcomes. This is neither negligence nor obstruction of progress but simply clinical perspective, a perspective that must also allow for the possibility of false positive results and the ensuing fruitless pursuit and cost that these too might involve.[8]

In striving for the best for our individual patients, we must nevertheless recognize our responsibility to the health system. This is perhaps best typified by the present debate regarding Avastin versus Lucentis in the treatment of exudative age-related macula degeneration.[9] There is much hand-wringing about the affordability and sustainability of Medicare, and the runaway increase in out-of-pocket medical expenses, yet each guild tends to advocate to the Medicare Schedule Advisory Committee of the absolute necessity for listing of the latest device or treatment in its specialty.[10] Health bureaucrats are dependent on our considered advice and the pudding is not magical. Being circumspect in recommending only those applications that have real relevance to clinical care would be brave and responsible. Low-value care siphons resources from an often-finite funding pool.[11] The notion that this pool can expand in perpetuity is misguided: if clinicians cannot constrain their enthusiasms, then capitation- or outcomes-based funding may do it for them.[12]

A parallel can be drawn with the vocational training schemes of the medical colleges: we now assess our vocational trainees to the standard of competence, not to excellence, much as we still urge them to the latter.[13] In order to sustain our health system, we may have to apply the same ethos to funding clinical care, especially where the 'excellence' is a garnish urged on us by industry or peer pressure in the absence of quality supporting evidence.

A further perspective is a wider one still, which is global public health. Take cataract: there are, by the World Health Organization estimates, more than 20 million people still blind from cataract in the world, a number that is expected to increase to 40 million by 2020.[14] Femtosecond laser-assisted cataract surgery (FLACS) is fascinating, but provides no clinically-appreciable visual benefit over standard surgery in the overwhelming majority of cases.[15] How then shall we explain to utilitarian philosophers such as our own Peter Singer the ethics of us deploying FLACS technology – the unit price for which is roughly half a million dollars – which adds a thousand or so dollars to the patient cost, is variably rebated by private health insurance (PHI) and then further subsidised by the tax system through the PHI rebate and Medicare Safety Net?[16] It would be gratuitous to calculate the number of cataract-blind in the world who could be treated for these amounts if the rebates were redirected to foreign aid budgets.

Medicine in Australia – and in the Western world in general – continues to increase its percentage drain on the nation's gross domestic product.[17] This is driven in part by increased longevity expanding the aged population, but also by the increase in both the volume and complexity of innovation that can be applied to this cohort and others. Protests will come from those who feel that 'nobody should be deprived of anything', from others – some with vested interests – who decry the risk to the reputation of our 'world class health system'. Industry will ask why it should continue R + D if it cannot capitalize on its investment; and there may be a furtive complaint or two at having to sacrifice 'a nice little earner'. The discussion remains a necessary one.

Rationing in health care has been mooted for years, and it behoves us – even to the detriment of our self-interest – to deploy diagnostic testing in a considered and judicious way rather than as a default panel of tests; to perform surgery that is efficacious rather than merely novel, market-differentiating or lucrative; and to provide to those charged with making sustainability decisions honest and rigorous advice concerning the real clinical utility of diagnostic and therapeutic innovations.[16]

To continue to pursue funding for all applications without this filter may risk the sustainable provision in the future of those developments that really do make a difference.

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