

Ageing Gracefully in 2020

VM S Oh,**FAMS, MD, FRCP*

“Tell me, why should symmetry be of importance?” Mao Zedong, statesman, 1893-1976.

Nobody's life or death is an island. My teaching diary for 1990 yielded these notes-science is great but slow; who will govern people's health in 2020? I believe the answer is that a cooperative of doctors, information brokers, and patients will manage healthcare. Its technical standards will probably be high. But how to ensure a modicum of dignity and sense of belonging in people's later years?

The coin of life spins, on one face of which is health, and on the other disease. When the coin slows and disease prevails, doctors will probably play a role, hand in hand with our families. Over time the aged will form an increasing proportion of society in Singapore, as in the West.¹ Doctors, as carers, can therefore influence the circumstances of both ageing and death in the community. Commonsense infers that for dying people, home is best. But more and more patients die in busy acute-care hospitals, which cannot always provide gracious care for all dying persons.

In optimising the care of ageing and dying people, it is important to devise more equitable and effective community-based ageing policies. Helping our old folk to live, and die, with grace and dignity should be part of a national ageing policy. We should focus on improving the experience of ageing.

This objective is very different from that of clinical research which supports “salvage” treatments. The unspoken goal of salvage treatments is to postpone death, to buy time for the more radical and, therefore enduring treatments. The major trend is towards high-cost techniques such as coronary and peripheral vascular stenting, laparoscopic surgery, and robotic surgery. Much tension exists between this type of “technomedicine” for the elite, and preventive medicine and health promotion for the many in the community. This tension will persist.

Many experts believed in 1987 that an “AIDS vaccine” was just around the corner. Similarly, the illusion persists that medical science will soon vanquish the common killing diseases of the elderly. The truth is that the great attainments of molecular and cell biology of the past 30 years have hardly influenced clinical practice.² For instance, gene therapy is not consistently effective even for single-gene disorders, largely because of difficulty in selectively delivering desired genes into the tissue target. Molecular medicine has proved that simple mechanisms do not cause the major killers, such as coronary heart disease, hypertension, and diabetes. Gene therapy for these complex, multiple-gene, disorders is a long way off, and is less likely to succeed radically because life events modify the genetic potential as we age.

The experimental evidence suggests that ageing is associated with specific alterations in critical proteins, cumulative environmental injury to cellular DNA, and a progressive failure of antioxidant protection systems and DNA repair. It is likely that the killing disorders of ageing people, for instance dementia, cancer, and atherosclerosis, depend on these mechanisms, weighted according to the involved tissue. We will not soon see radical treatments for these conditions.

Can we actually *prevent* common diseases of the vital tissues in the ageing population? Cryptogenic hypertension and cancer, for example, share some causative features. Several different triggers and routes lead to a common disease phenotype, and both disorders result from the complex interactions of genetic constitution, environment, and the wear-and-tear of ageing. In these two diseases, current prevention relies on altering life habits-stopping smoking; taking more exercise; reducing the intake of salt, alcohol, and harmful exposure to sunlight; increasing intake of high-fibre and antioxidants. So far, the objective measures of outcome show only modest success. Even antihypertensive drug treatment prevents only about 14% of deaths from myocardial infarction and 40% from stroke respectively.³ With cancers the response to treatment is even more variable and less predictable in the individual patient.

Hypertension and cancer exemplify how physicians alter function using treatments whose desired effects are regularly offset by unwanted or unknown reactions. Clearly the treatments based on conventional science alone cannot deliver sweeping success. Long-evolved cellular homeostatic systems compensate for the therapeutic alterations.

* Professor and Consultant (Special grade)

Address for Correspondence: Professor V M S Oh, The National University of Singapore, Department of Medicine, National University Hospital, 5 Lower Kent Ridge Road, Singapore 119074.

The great challenge facing today's physician is how to collate the information from human pathophysiology, cell biology, and molecular medicine to produce radically new treatments. First we need to identify the products of genes which determine the susceptibility or resistance to, say, hypertension, or Alzheimer-type dementia. Second, we need to understand intracellular signalling, which is a massive task even for one tissue. Third, we need to overlay upon this foundation the inter-cellular signals, and inter-system bundles of chemical information. Finally, we have to project for individuals the trajectory of tissues through space and time. Because the complexity is massive, we need computational biology for this task, and the last step will require controlled studies over years.

If we cannot soon prevent common age-related diseases on a community scale, can we at least decrease the discomforts of ageing and death? We are learning more about how the available drugs and nutrients help or damage ageing patients, both during formal evaluation⁴ and after marketing.⁵ I am excited by drug discovery programmes based on antioxidant molecules (e.g. probucol and isoflavonoids) that downgrade the tissue inflammatory and repair processes which may initiate or promote atherosclerosis. Customised symptom-relieving drugs will in part counteract the expensive salvage technologies, which necessarily divert funds from basic research. But cost control is a limiting factor everywhere.⁶

In a community in which disease patterns are increasingly "Western", our citizens' expectations of healthcare are equally unrealistic. Many patients expect advanced technomedical care, but do not want to pay for it. Indeed, nobody wants to pay higher prices for diminishing returns. Our Government has limited medical-benefit contributions to around 2% of salary, and healthcare spending to about 3% of the gross domestic product, aiming to curb costs.⁷ This policy is eminently sensible. However, we urgently need better guidelines on what is cost-effective treatment, and prevention, for the major diseases.

"Is it uncomfortable to grow very old?" my son recently asked. I answered, "Depends in part on where you live". In our post-CNN world the self-immolation of elderly Innuits in Canada is an obsolete model. The United States is outstanding in basic ageing research. It also spends 62% of total health expenditure on care for elderly folk,⁶ much of it technomedicine. Every medical school in Britain has a department of geriatric medicine, itself the third specialty in numbers of doctors. China combines geriatric care with draconian measures to discourage large families. Japan has a tax-based public insurance scheme to deliver better care to the aged, mainly in their homes; we should further develop our own schemes.

In Singapore the elderly experience some social continuity by interacting with younger persons, but should we rely just on the goodwill of the young? For many health personnel it is difficult to maintain comprehensive yet humane care in the face of extreme clinical specialisation. However, we have an opportunity to buck the Western trend. We need to inform and strengthen the social support apparatus, from geriatricians to school volunteers. We should pay caregivers more, to promote a new breed of professionals who rate humanity above technomedicine. I have little confidence in "retirement villages", a variant of "homes for the aged". Isolating older folk is a short-cut to depression. Revitalising the bonds of extended families, with give and take, may work better in our community. We in Singapore can transform ageing into something to be proud of.

The fusion of Eastern with Western outlooks suggests an answer to Mao Zedong's question. We value symmetry because it is fundamental to humanity, to the roots of biology. Children give us confidence to overcome our primal fear of the unknown. Most people love their children, for they refresh life, share laughter, and promote liberty. In turn to revere our elderly in a traditional yet transformed fashion, what better way to promote grace? To withdraw technology and offer the human touch at the right time is the best way to celebrate life.

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