

# Medicine and ageing – an agenda for progress

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Ageism in medicine is not due simply to ethical and philosophical issues, but rather to a misperception and ignorance of the process of ageing and its consequences. A strong antidote to this lies in the development of a cohesive approach from medical, biological and social gerontologists, which might perhaps result in a strong body of evidence. Further, academic medical gerontology has a strong but collaborative role to play in the development and evaluation of therapeutic and preventative interventions, particularly complex interventions for the UK's rapidly expanding elderly population.

The disposable soma theory might provide clinicians with a sustainable concept of ageing which could be used to underpin their thinking, and which would characterise ageing as a gradual and random accumulation of molecular faults and cellular damage, with a consequent loss of adaptability to both internal and external milieux. This is opposed to a pre-programming model of ageing, and offers an opportunity for intervention at genetic, molecular and cellular levels, as well as at the level of specific disorders, altered homeostasis and the external milieu.

It is necessary to strengthen the currency of the term 'medical gerontology', defined here as 'the study of ageing, including population ageing, and as it applies to the science and practice of ageing'. This definition should be underpinned by some strands of practical thought governing intervention, such as the existence of co-morbidity and heterogeneity in older people, and of diminishing adaptive reserve to both internal and external milieux.

Progress in services for older people has often been more of a response to contingency or unexpected discovery than part of any plan. The speciality of geriatric medicine was spawned in the Poor Law Hospitals as a result of the 1929 Local Government Act, and developed through the Second World War and the foundation of the NHS. Physicians charged with the care of the elderly initiated the blend of custodialism and medical neglect which is now legendary. However, the resulting systematic diagnosis of multiple medical problems, the introduction of rehabilitative nursing and therapy, and the assessment and management of social relationships and circumstances, produced very positive results, even for some with advanced long-term dependency. The extension of this approach into

earlier rehabilitation, intermediate care and mainstream acute care in partnership with primary health and social care resulted in the models of specialist hospital-based practice we know today. However, the evidence for what comprehensive geriatric services, or their respective components, do remains at best piecemeal and at worst completely soft.

An historical phenomenon in drug development has been the exclusion of older people from clinical trials, even for drugs of which they would be the predominant consumers. It is clear, though, that there is potential for age-associated disorders, which have previously been considered intractable, to benefit from modern drug therapies. The exclusion of the elderly from trials, like custodial neglect, is a manifestation of ageism and is based on the perception that the health needs of the elderly are intractable. There is, however, good evidence of their capacity to benefit.

It is encouraging that randomised control trials of complex interventions are increasing. Efficacy studies on stroke and falls, both good models for other age-associated syndromes characterised by

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## Conference programme

- **F E Williams lecture: Medicine and ageing – an agenda for progress**  
Professor Cameron Swift, President, British Geriatrics Society and King's College London
- **Biological ageing – contemporary concepts**  
Professor Thomas Kirkwood, University of Newcastle upon Tyne
- **Population ageing – what it means in practice**  
Professor John Bond, University of Newcastle upon Tyne
- **Lessons from stroke, an age-associated disorder**  
Professor Raymond Tallis, University of Manchester
- **Lessons from falls, a syndrome of ageing**  
Professor Declan Lyons, University of Limerick, Ireland
- **Benchmarking non-drug interventions**  
Dr Jonathan Potter, Clinical Effectiveness and Evaluation Unit, Royal College of Physicians
- **Evidence and clinical governance**  
Professor Martin Severs, University of Portsmouth
- **Evidence and the National Service Framework**  
Professor Ian Philp, National Director – Older People's Department of Health

reduced adaptability, have been conducted with the hypothesis that these conditions could be ameliorated by complex interventions.

Clinicians, and more recently scientists, have advocated improvements in services for older people; scientists must now find their role, a role which should centre around developing a strategy for evidence. This involves beginning from a common standpoint in sustainable concepts of ageing and, based on this, identifying the key questions which need to be answered and giving voice to a proper structure for the descriptive and experimental work required. Ageing, in all its complexity, is a central issue in human health and disease, and cannot be addressed as an afterthought.

The numbers of elderly people are set to increase. Supporting their right to benefit with evidence is the real mission of medical gerontologists working in tandem with colleagues from the social and biological sciences.

### Biological ageing: contemporary concepts

Ageing is not something that begins at a defined point, but is rather a life-long process. The idea that we are 'programmed to die' is a fallacy: in fact we are programmed for survival, it is just that we are not programmed well enough to survive indefinitely.

The disposable soma theory explains ageing as a consequence of the random molecular damage which the body is subject to throughout life. The molecular damage results in an accumulation of cellular defects, which in turn result in functional impairments in organs and tissues leading to age-related frailty, disability and disease. This is a circular process since the functional impairments also affect the level of damage at the cellular level.

Oxidative stress is the cause of damage in the body: in this process free radicals escape, damaging the first thing they encounter, whether it be proteins, membranes, chromosomal DNA, mitochondrial DNA or telomeres. Research has shown that DNA repair enzymes operate to repair the damage caused by these free radicals, and that the difference in longevity between various animals can partly be explained by differences in the activity of their repair enzymes. This suggests that we might be able to increase lifespan by intervening in the operation of the DNA repair enzymes.

A great deal of research has been conducted on telomere theory over the past ten years. Telomeres, the ends of chromosomes, shorten over time as a result of oxidative stress, encouraging senescence. It is therefore thought that the length of telomeres might act as a kind of litmus paper, a marker for the amount of oxidative stress that a person has experienced. Studies in Berlin have also shown that people with vascular dementia have significantly shorter telomeres than the general population: this raises the issues of whether oxidative stress is a major factor in the pathology of vascular dementia, and whether telomere length could be used as a prognostic indicator.

The interface between ageing and disease is something that we need to understand more thoroughly. When we talk about 'normal ageing', do we mean to exclude the diseases we see in

older people, or are we accepting that these diseases are a usual part of the process? It was also pointed out that the difference between 'normal' processes of ageing and some clinical conditions is not one of nature, but rather one of degree. For example, osteoarthritis and dementia are characterised as diseases, and yet they can be, like the process of ageing in a more general sense, characterised by the accumulation of random molecular damage and resultant cellular defects. Osteoporosis is also approached as a disease, and yet all humans begin to lose bone mass after the age of thirty. Professor Kirkwood suggested that, although the distinctions between ageing and disease are very helpful, they can sometimes get in the way of understanding what is really happening.

What accounts for the individuality of ageing – the way that people age at different rates and in different ways? Research assessing the heritability of lifespan has shown that genetics is roughly 25% to blame. The other three-quarters can be attributed to nutrition (some foods cause damage, others are rich in the anti-oxidant vitamins C and E), lifestyle (studies have demonstrated the beneficial effects of appropriate amounts of exercise), environment (there is a very strong interaction between what an environment does to a person and ageing at a molecular and cellular level) and, finally, chance.

In conclusion, it was suggested that the ageing process is intrinsically malleable, and that the integration of the different perspectives with which we approach ageing is paramount if we are to achieve successful interventions.

### Population ageing: what it means in practice

The population structure of the UK is changing. Over the last century, improvements in medicine and conditions have seen older people as a percentage of the population increase. This change is world-wide, and one which worries governments as more and more people become dependent on long-term care.

One economic argument that has been put forward is that continued economic growth leads to an improved quality of life for everybody, including the elderly. However, the focus on profit means that there are often casualties when things go wrong. Threats from globalisation to the UK's ageing population might include the failure of personal investments and pension funds as a consequence of market destabilisation, and the decreasing sustainability of neighbourhood services in local communities. An example of the latter is the closure of many small groceries and the trend towards large out-of-town supermarkets.

Institutionalised ageism is a result of many factors. Among these are the forces of modernisation and technological change, which often result in a misperception of the usefulness of old people's knowledge and skills, the power of structured dependency, and the value modern society places on youth and youthfulness and the attendant age-consciousness. Examples of ageism in the NHS can be seen in life-extending technologies, such as coronary care units, long-term dialysis and intensive care units, and in screening procedures and service organisation. Infantilisation, here defined as the way in which formal and informal carers control the care of older people through the

use of the metaphors of childhood, is a process through which ageism is reinforced, and which denies the individual full personhood.

Ageism means that we miss the contributions of older people to our society. The National Service Framework for Older People has begun to address the issue in medicine, but in future it will be necessary to continue to challenge ageism in ourselves and in those around us, to encourage life-long learning and flexible working patterns, and to support the political participation of older people.

### Lessons from stroke: an age-associated disorder

The risk of stroke increases exponentially with age, and because stroke is a widespread problem, preventable, complex but manageable, and offers room for clinical improvement, it serves as a good paradigm for other age-associated disorders. The distinction between 'age-caused' and 'age-associated' is an important one: the first phrase suggests that a condition is inevitable, and that only a delay in its onset is possible. 'Age-associated', on the other hand, suggests that it might be subject to prevention, treatment and rehabilitation.

Basic science shows that the aged brain has remarkable powers of recovery, corroborating the adage that 'where there's life, there's hope'. Environment is an important factor in this recovery; emergent therapies such as stem cells and drugs are useful, but need to be coupled with afferent input associated with normal activity in order to aid rehabilitation.

Looking at the way physicians deal with stroke in the field, we can see that prevention is possible, but that the 'possible' is not fully achieved. We also see that knowledge is not enough; application is what matters, and application requires its own science, the organisation of care.

There is evidence that organised stroke care saves lives, reduces chronic disability, and shows sustained benefits. Studies have also shown that the gains of good organisation are at least ten-fold those of the best acute drug treatment, aspirin. Wholes may be greater than the sum of the parts; we must, however, also look at the parts.

Rehabilitation can be defined as a package of interventions designed to lessen the impact of disabling conditions. Higher level, or 'homely', interventions are those which aim for an adaptation to impairment, and can be more successful than those which aim for a reduction in that impairment through lower-level or 'hands-on' interventions. It was suggested that theory-driven practice can be a barrier to progress; many treatments which are known to be effective, such as progressive resistive exercises, electrostimulation and EMG feedback of muscle activity, were until recently disapproved of by the dominant school.

In conclusion, pessimism is unjustified however elevated its source. We do not face a silent pandemic of disability and dementia. The prevention of stroke does not lead to increased disability from later, postponed strokes, and a co-ordinated effort from physicians could result in a significant reduction in the incidence of the condition.

### Lessons from falls, a syndrome of ageing

The conceptual distance between biological theories of random molecular damage and clinical practice is a large one, and falls are a way in which we can make the 'pathophysiological journey'.

Falls are the biggest single reason for old people presenting in A&E. Each year, one-third of people over 65 will have a fall at home, and 66% of accidents are fall related. They are associated with high mortality, high morbidity and high rates of institutionalisation. Falls seem quite simple *per se*, but a more complex understanding of the subject is necessary for physicians seeking to understand *why* people fall.

Professor Lyons argued that there is a fundamentally age-associated pathogenic mechanism for falls centring around blood vessel dysfunction, and concluded by suggesting that the phenomenon showed someone coming close to the end of their homeostatic reserves.

### Benchmarking non-drug interventions

Benchmarking can be defined as 'a process through which best practice is identified and continuous improvement pursued through comparison and sharing'. Evidence-based models of best practice can be generated by way of observational studies, standardised data collection, quantitative studies or experience and extrapolation.

It is necessary to agree best practice and set the benchmark. It is important that the benchmark be supported by a strong evidence base; however, development nowadays is so rapid that there is often a time lag between ideas, concepts, and proof that they work. An example of this is stroke units, which were first suggested in 1953 but had their efficacy questioned until Dennis and Langhorne's systematic review appeared in the *BMJ* in 1994.<sup>1</sup>

Benchmarking is clearly capable of reflecting and improving local and national standards of care. Its future success, however, is dependent on the facilitation of research to assess best practice, and the incorporation of evidence-collecting information systems into the everyday practice of medicine. The British Geriatric Society has a strong lead role to play in benchmarking and improving services.

### Evidence and clinical governance

The concept of clinical governance first appeared in the NHS white paper, *A first class service*<sup>2</sup>, in 1998, was built into the Health Act of 1999, and was further enhanced by the NHS Plan. It was originally defined as 'a framework through which NHS organisations are accountable for continually improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence and clinical care will flourish'.<sup>3</sup>

The clinical governance website<sup>4</sup> is strong on cultural change and links well with national policy, individual improvement initiatives and the Clinical Governance Support Team and their

in-house support model. However, the detail in some case studies it presents is insufficient and few examples focus on patient benefit. It also contains limited information on how clinical governance might be reviewed, implemented and demonstrated, and the generalisability and conformance of the examples it gives.

Several issues emerge through discussion with colleagues. There is some concern over who is teaching the teachers, as well as over data standards (how can one be sure that data are a true reflection of service and practice?), performance indicators and critical incidence techniques. Overall, though, there seems to be a strong commitment to improving patient care coupled with a feeling that having the time to do it is sometimes a luxury.

Before 2000, articles by leaders show a strong focus on quality improvement, an emphasis on the importance of culture, leadership and teams, and an awareness of clinical governance's link to evidence based practice, and research and development. Post 2000, the articles strengthen clinical governance as part of a quality strategy, highlight data quality issues and service design, and demonstrate success more explicitly.

Review of the literature and information surrounding clinical governance suggests that the concept has face validity, is wide-ranging and contains several processes for improvement, it sits within a system ensuring quality in the NHS, includes evidence-based practice, and focuses on services for patients. It is, however, difficult to assess its efficacy – separating its influence from the other initiatives which are designed to improve the health service is academically challenging. Clarity about which quality improvements are clinically and cost effective is lacking. Finally, clinical governance is a systems science, but the NHS does not appear to have any systems education programme.

## Evidence and the National Service Framework

Professor Ian Philp suggested that the theme of the 'Medicine and ageing' conference could be said to be the necessity of integrating research, policy and practice, particularly in relation to medicine and ageing. It is necessary to bring a measured passion to this task, one which combines the search for truth with a passion for social justice.

Three principles must underpin any policy concerning the care of older people. Firstly it is necessary to overcome the fragmentation of services and to decide who is accountable for the whole system. Secondly, the provision of timely access to specialist care must be a prime consideration. Finally, policy makers must do their utmost to promote health and an active life.

The National Service Framework for Older People draws on advice from practitioners, researchers, educators, policy-makers, older people and unpaid carers, and is tested against evidence. It aims at a partnership with unpaid carers and the provision of good dementia care, as well as good intermediate care options which give the right service to the right person in the right place. It values an early expert response to crisis, a response which allows patients to receive appropriate care immediately rather than having to work their way up a hierarchy. Also central are organized falls services.

Further research and development must focus on intermediate care, the single assessment process, falls and a greater coherence in gerontology services. End of life care should involve passion tempered by evidence. Old people think about dying all the time, and are often relieved when people are willing to talk to them about it. The process should be approached by doctors on a more human and empathic level, rather than simply in terms of statistics or clinical science.

## References

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- 4 Clinical governance website: [www.doh.gov.uk/clinicalgovernance/index.htm](http://www.doh.gov.uk/clinicalgovernance/index.htm)