**Growing research in geriatric medicine**

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Caring for older people is now the predominant activity of health systems in high-income countries, and will soon become the predominant activity in many lower and middle income countries [1]. At present there is a mismatch between the scale of healthcare need for older people, and the relatively modest amount of research funding and activity in this area which is holding back much-needed innovation. A number of initiatives have aimed to redress the balance - in Europe for example the Increasing Participation of the Elderly in Clinical Trials (PREDICT) consortium studied the participation of older people in clinical trials and proposed ways of boosting recruitment [2]. In the UK in 2017-18, over 22,000 older people were recruited to studies on the National Institute of Health Research (NIHR) Clinical Research Network portfolio, but only 7,000 were recruited to studies primarily categorised under Ageing; the number of clinical studies primarily categorised under Ageing on the NIHR portfolio [3] is 29% and 16% of the number for respiratory medicine and cardiovascular medicine respectively.

Why might this be, and what can we do about it? These questions were considered by a group of UK research-active geriatricians in March 2018, gathered under the auspices of the NIHR Newcastle Biomedical Research Centre, UK - which has a particular focus on ageing and long-term conditions. Invited senior investigators, trainees and PhD candidates met for an intensive one-day meeting, and this commentary describes some potential solutions generated by the group.

*What are the problems?*

The first problem is one of capacity. There are few research-active clinicians compared to the volume of clinical activity; this shortage is evident for academic nurses and allied healthcare professionals (AHPs) in the field as well as doctors. Research work in geriatric medicine is vital for patients and society, but may not always translate into the metrics by which universities value and appoint staff, such as reports in journals with a high impact factor. Lack of visibility may contribute to academically inclined trainees not perceiving geriatric medicine as a research-active specialty to pursue, and consequently diverting into other specialities.

The second problem is one of culture. There is a perception amongst some clinicians that geriatric medicine is not a speciality that needs to do research – a view perhaps driven by the problems outlined above. Research is too often seen as distant from practice, findings are not effectively disseminated or embedded into teaching or care, and the research agenda is not always perceived to align with the priorities of patients, policymakers or clinicians.

The third problem is a failure of translation. Much ageing research is done in discovery science, but with few clinicians directly involved this work has had little impact on patient care to date. Similarly, at practice level, geriatric medicine is constantly innovating and developing new models of service, yet little rigorous evaluation takes place. Much of the research that is conducted lacks the scale or impact to influence practice.

What then might the solutions be? The meeting considered four major areas of activity, which we outline below:

1. *Involving clinicians in research*

Clinical research at scale requires recruitment at multiple sites, many of which may not be affiliated to universities. Hence we need to ensure that all clinicians can be active in research; such an approach is also likely to facilitate implementation of findings. In the UK, the NIHR CRN Ageing Speciality Group and parallel structures in the devolved nations assist this process by providing infrastructure support for clinical ageing research delivery. Involvement in research by early career staff across all professions would develop a larger group representative of those delivering care who are familiar with research processes such as recruiting to clinical trials; a spin-off benefit would be enhanced awareness of, and skills to interpret, research evidence. Support networks have been successful in supporting clinicians to engage with research in some disease areas, such as stroke, Parkinson’s, dementia, and osteoporosis – and in delivering focussed training for clinicians to support research activity. The challenge is to ensure that ageing syndromes and a wider range of disease areas are represented.

Funding is necessary either to support research time directly, or to allow cover for research time by others. Although mechanisms in the UK do exist to allow funds to ‘follow the participant’, service pressures often make it difficult to release time even when funds allow. In healthcare systems where private practice or clinician-level billing are prevalent, funding is essential to make research activity an attractive and viable alternative to service delivery.

1. *Developing early-career researchers*

The decision to specialise in geriatric medicine is made relatively late compared to some specialities [4,5]. Academics focussing on ageing and the care of older people are in competition with these other specialities – for fellowships, awards and for university tenure. Furthermore, they do not typically have access to the considerable funding resources of, for example, the major cardiovascular health and oncology research charities for early career support. Any successful approach to building capacity therefore has to start early. The pipeline of trained investigators could be strengthened by enhancing the visibility of the speciality in undergraduate medical, nursing and AHP education; offering undergraduate research projects relevant to ageing, and providing research training for very early-career practitioners. The resulting candidates would have better awareness and experience, and be competitive for higher research training at PhD level. Expanding the numbers of PhD posts relevant to translational ageing research is necessary, but is unlikely to be sufficient.

The transition from PhD to independent researcher remains a major challenge in many scientific disciplines [6]. Good mentorship for academics at this career stage is critical to drive successful intermediate fellowship bids; models such as the establishment of an Ageing Academy or School for Ageing Research may be required to deliver this support. Representation of geriatric medicine on selection panels is also necessary to provide relevant expertise for funding decisions, taking into account the often highly complex mechanisms and pathways involved in ageing biology and common geriatric syndromes.

1. *Getting research into clinical practice*

Bridging the ‘know-do’ gap [7,8] is essential if research benefits are to reach patients. Choosing appropriate research questions is important, and the James Lind Alliance on priority-setting for research is an excellent model for this [9]; the alliance has recently published the top ten priorities for research for people with multiple conditions [10]. Co-production of research by knowledge users and research teams helps to ensure that the results will be relevant to both clinicians and patients. Embedding assessment of implementation strategies (in particular areas of implementation failure including cost, training and workflow) is another key component, as is the use of linked, routinely collected health and social care data to evaluate interventions in real-world populations. Co-production can also help with dissemination - targeting research findings to research users in ways that they find useful. Research users need to be ready to receive and engage with research findings; this can be facilitated by delivering research findings that are both relevant and accessible to practitioners. In the UK the applied healthcare research programmes of several regional NIHR Collaborations for Leadership in Applied Health Research and Care (CLAHRCs) seek to address this translational gap.

1. *Expanding the funding envelope*

There is growing awareness of the importance of ageing and care of older people by funders. European Union funding streams have included a substantial component of research which is directly relevant for older people. Within the UK, the recent Academy of Medical Sciences report on multimorbidity [11] presages increased interest from a range of funders in this area. In his 2017 Harveian Oration [12], Professor Chris Whitty, Head of NIHR and Chief Scientific Advisor for the UK Department of Health and Social Care, spoke of the urgent need to focus on the health of older people, particularly those with multiple conditions, and of the need to drastically increase the capacity of the research community to tackle the health problems of old age. If these funding streams are to fully benefit older people, academic geriatricians need to drive multidisciplinary, multicentre bids to address key research questions at scale and pace, as well as providing representation on the funding panels that consider such bids.

There is also scope to widen our funding sources. In the UK, individual philanthropy is relatively under-used compared to the USA, and industry is not currently a major funding source – although care is needed to ensure high-quality science and to avoid conflicts of interest and intellectual property. As instinctive collaborators used to working in multidisciplinary clinical teams, geriatricians are well placed to exploit the current interest in interdisciplinary funding, as well as working with other specialists in accessing funding from organ-specific charities. In the US there is a dedicated National Institute on Aging (NIA). Opportunities exist for international collaborative work accessing NIA funds via partnering with US colleagues, even with current budgetary pressures [13]

In summary, growing research in geriatric medicine and interdisciplinary gerontology is an essential component of improving healthcare for older people. This is now being prioritised by governments and funders. There has never been a more opportune time to demonstrate that as a community we can bring academic and clinical activity together to provide better care for our patients. We must be both innovative and bold in developing capacity to deliver research into practice – our patients deserve no less.

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