

Rising to the challenge: Training the next generation of clinician scientists for South Africa

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Background. A shortage of clinician scientists globally, particularly in the developing world, including Africa and South Africa (SA), is well known and was recently highlighted in a consensus report by the Academy of Science of South Africa. There is a need to find innovative ways to develop and advance clinician scientists in SA.

Objective. To provide opportunities for young clinicians to develop research skills through enrolling for a PhD.

Method. To address this need in SA, we developed an innovative programme over 2 years in collaboration with the Carnegie Corporation of New York to support and train young specialist clinicians in research as the next generation of clinician scientists, through a full-time PhD programme.

Results. Since initiation of the programme in March 2011, 16 such specialists have been enrolled at intervals in the Fellowship programme, 5 have qualified with PhDs, while a further 3 are expected to qualify shortly. Publications and presentations at congresses have been recorded as well as grant applications.

Discussion. Although the programme is seen as an important initial step in addressing the shortage of clinician scientists, its dependence on donor funding and the lack of a secure career path for clinicians wishing to spend more of their career in research pose problems for the programme's sustainability. It is hoped that the positive outcomes of this experience will initiate further programmes of this kind at academic institutions and attract the attention of funders and universities in order to sustain and enlarge this initiative.

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In Africa we are faced with enormous challenges in healthcare that require intensive and high-quality research; yet, there is a lack of clinically trained research scientists and of support for those who do exist. If South Africa (SA) in particular and Africa in general are going to tackle their huge healthcare

burdens appropriately, we need well-trained scientists with clinical expertise to lead research endeavours and to train our future clinical researchers.

Because of the 'serious decline in clinical research activity and capacity', the Academy of Science of South Africa (ASSAf) examined the state of clinical research and related training in South Africa. In 2009, the report published by ASSAf recommended, among others, 'stimulating PhD degrees for professional graduates through the widening of the necessary opportunity and support mechanisms'.^[1] The recommended target was 500 PhDs to be produced in the clinical research field over the next 10 years.^[1]

In the USA the MD-PhD pathway appears to be the most prevalent way of training clinician scientists.^[2] The federal government through the National Institutes of Health (NIH) is the major funder of such programmes.^[3] While the MD-PhD programme has been successful, the postgraduate training of clinicians in research is also showing promising outcomes.^[4] A similar programme was established in the UK in 2000 following reports from the Royal College of Physicians and the Academy of Medical Sciences of the United Kingdom.^[5] However, this process, while well funded and highly competitive, has had low PhD completion rates.^[3]

The importance of investment in the development of clinician scientists cannot be overestimated. However, not all governments invest or invest sufficiently in this area. While the ASSAf report^[1] recommended 'raising the Research and Development budget to 2% of the gross domestic product (GDP), of which 20% should be allocated to health research', as well as other

measures, to date this is only slowly translating into funding for capacity development in the clinical sciences in SA.

In 2009, the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, SA, supported by the Carnegie Corporation of New York, chose to initiate a programme around the development of appropriately skilled academic clinicians, of which the clinician scientist was an integral part.

This article describes the setting up of the programme, the aim of which is to provide opportunities for young clinicians to develop research skills through enrolling for a PhD.

Methods

On the basis of funding from the Carnegie Corporation of New York, the Faculty of Health Sciences formalised the 'Academic Medicine Clinician Scientist PhD Programme' within the Health Sciences Research Office and appointed a Director of the programme to provide oversight and mentorship to the Fellows.

Applicants are required to have a medical degree and a specialist qualification (MMed degree). The Fellowship is of 2 years' duration (restricted owing to funding), during which period Fellows are expected to complete their PhD – ready for submission for examination. Fellows select their own field of research and supervisor/s in one of the well-established research niches in the Faculty. As part of the Fellowship the candidates have to attend courses, e.g. on research methodology, biostatistics, scientific writing, research ethics, curriculum design and student assessment. So as to allow for full-time research activities, the Fellows do not participate in routine clinical service delivery. Once the PhD degree has been attained, funding is also provided towards running expenses for postdoctoral research activities to encourage the setting up of a research niche by the Fellow.

It is critical to adequately support the Fellows financially during the 2-year period of their fellowship. Therefore, each Fellow is provided with a tax-free stipend approximately equivalent to that which they would have earned in their clinical post, but without overtime remuneration, medical aid and pension contributions. As most SA academic clinicians are employed by the Provincial Government, it has been important to negotiate with the authorities to allow the relevant Fellow/s to take a 2-year leave of absence from their posts to allow them to return to their clinical position on completion of their fellowships.

Results

To date we have enrolled 16 Fellows into the programme in 4 cohorts of 4 Fellows each per annum. The 16 Fellows were ethnically diverse – 7 black, 6 Indian, 2 white and 1 coloured. Fellows accepted into the programme were mainly of SA origin (14 out of 16). Thirteen of the 16 Fellows were females. Fields of research have been generally well distributed over the disciplines within clinical medicine, thus establishing niche areas where research in these specific fields can grow in the future.

While the programme is in its infancy, we believe the outcomes have been substantial. The first cohort of 4 Fellows completed their Fellowships in 2013 and graduated in the same year, thus completing their degree in the minimum 2-year time period. All 4 graduates have returned to their clinical departments in the academic hospitals. The second cohort of 4 Fellows was due to complete in July 2014 (only 1 has graduated within the 2 years, the others should be submitting their theses shortly), while the third and fourth cohorts are still in the early stages of their research.

Publication outputs with regard to cohort 1 have been very encouraging (11 publications), as well as several presentations at local and international congresses. Publication output from the second cohort has been less substantial to date. In addition, 3 of the Fellows from cohort 1 were awarded a total of 4 awards for their presentations at national congresses, and thus far 1 Fellow from cohort 2 has been awarded for a presentation at a congress. One Fellow from cohort 2 was appointed as Assistant Dean for Teaching and Learning. Two of the Fellows have been awarded substantial grants by an external/corporate foundation. A total of 81 research courses have been attended by the first 8 Fellows, indicating the perceived need for such formal training during the PhD programme.

Discussion

Although in its infancy in comparison with programmes in the USA and UK, the Wits Academic Medicine Clinician Scientist Programme was successfully initiated to meet the need voiced by the SA Minister of Health, the SA Medical Research Council and ASSA^{f11} to increase the number of clinician scientists in the country.

The programme has demonstrated the possibility of training qualified medical specialists in research and academic skills, with the outcome of a completed PhD in a minimum of 2 years. We acknowledge, however, that this period is extremely demanding and inappropriately short when compared with other programmes such as the NIH Mentored Research Scientists Development Award (K01) programme, which provides protected time of 3 - 5 years for career development in clinical sciences.^[6]

Kosik *et al.*^[4] undertook a systematic review of the literature to identify the best models for clinician scientist training. Using outcome measures such as publications and/or awarding of grants, the authors identified 13 programmes in 9 studies. Of the programmes surveyed, the Medical Scientist Training Programme in the USA proved to be the most successful model, with 83% of graduates entering a career in academia and 78% receiving major grants,^[4] although this positive assessment is not shared by

all. Kosik *et al.*^[4] also suggest that training following specialisation through postgraduate programmes showed promising outcomes. The average time to complete the MD-PhD in 24 programmes in the USA was 8.0±0.4 years.^[2] In the SA context, as in other developing countries, where doctors are sorely needed following graduation, training clinician scientists at the postgraduate level is the financially more viable and faster option.

The gains already experienced from this new programme have been substantial. It has firmly established the opportunity in the Faculty for young clinicians wishing to obtain a PhD. Furthermore, clinical publications and conference proceedings have emanated from the programme. We hope the programme will have a positive effect on the retention of young staff, as on completion of their Fellowships the Fellows are expected to return to their original departments and are given research funding for a year post-PhD to encourage the development of a research nidus in their disciplines.

The sustainability of this programme is of concern. The funding required to maintain it is higher than that of the average PhD programme, as it has to provide a stipend which is commensurate with the age and qualifications of the Fellows. The lack of suitable funders locally may be a barrier to continuing and extending the programme. In addition, the lack of a defined clinician researcher career path in academic medicine in SA is an additional barrier to continuance of the programme. In this regard, there is a need for the University to accept that it has the responsibility to fund research and support staff positions in the clinical disciplines.

While it is premature to assess the impact of this programme, its influence will be tracked over time. The challenges faced by clinicians in an African setting, through our quadruple burden of disease and the resulting heavy clinical service loads, are very different from those faced by clinicians in developed countries, and impact on the training of our young clinicians. Therefore, to enable our clinician scientists to achieve the relevant research training in this difficult arena, a structured programme ensuring protected time is imperative.

Conclusion

An innovative, structured programme that ensures protected time for undertaking research has been set up for the training of clinician scientists at our institution. This programme shows promising outcomes, which may lead to the training of a pool of clinician scientists for Africa.

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