



The **Academy** of
Medical Sciences

**THE TENURE-TRACK
CLINICIAN SCIENTIST:
A NEW CAREER PATHWAY TO
PROMOTE RECRUITMENT INTO
CLINICAL ACADEMIC MEDICINE**

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The Academy of Medical Sciences

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- to enhance public understanding of the medical sciences and their impact on society;
- to establish itself as an authoritative body to assess and advise on issues of medical science of public concern;
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The Academy provides independent authoritative advice on matters within its remit.

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1. Executive Summary

1.1 Fully trained *clinical academics* are doctors qualified as specialists or general practitioners and employed by universities to undertake *research* into the prevention, diagnosis and treatment of disease, *teaching* of undergraduate medical students, and *clinical practice* which includes direct responsibility for patient care and training young doctors. Consequently, clinical academics play a crucial role in shaping both the present and the future of the National Health Service.

Recruitment to clinical academic medicine is at a crossroads. Not only is there persistent difficulty in recruiting clinical professors but there is also worrying evidence that pressures related to the research assessment exercise have contributed to a reduction in the stock of clinical lectureships, the traditional seedcorn of the discipline. Recently qualified doctors still show strong interest in obtaining externally-funded research training fellowships, the ideal start to a clinical academic career. However, there is a shortage of opportunities for protected postdoctoral research, and strong disincentives operating after completion of the first research fellowship in both generalist and specialist settings have been exacerbated recently by inadvertently rigid implementation of the specialist registrar (SpR) grade for higher training in hospital specialties.

1.2 Three key ‘generic’ disincentives against an academic career have been identified in hospital-based specialties and general practice:

- (i) *a clear career structure is lacking* in academic medicine compared to a career in the NHS;
- (ii) *insufficient flexibility* for combination of post doctoral research training and clinical training is offered by current opportunities in the SpR and clinical lecturer grades; and
- (iii) *prolonged insecurity* results from the need for all clinical academics to undertake about five years of doctoral and postdoctoral research training and, in the case of specialists, up to five years of SpR training before a secure senior post is obtained.

1.3 Three further practical difficulties impede the development of academic careers in particular clinical disciplines:

- (iv) *pressure to seek research training upon completion of general professional training* because of difficulties in some specialties in entering a ‘blocked’ SpR grade;
- (v) *limited research training opportunities or environments* in some disciplines; and
- (vi) *particular limitations on flexibility for certain groups of trainees*, especially those in disciplines requiring persistent patient contact or the development and maintenance of practical skills; those with domestic commitments; and those seeking to change clinical activity.

1.4 The Academy’s proposals to address these disincentives and practical difficulties are as follows:

Recommendation 1

The normal entry to a clinical academic career will be a ‘doctoral phase’ of training, which would nevertheless allow a smooth return to a NHS career if this were desired. The key element of this phase would be a three-year period of research training, typically obtained by competitive application for entry to a training fellowship scheme. In hospital specialties the optimal time for entry to such a programme is from a secure clinical training base as a specialist registrar of one to two years’ standing. However, some trainees will choose to undertake research earlier in their clinical training, or as part of a MB/PhD programme at medical school. To enable continuity in both research and clinical training in such circumstances, outstanding individuals in these latter two groups should have direct access to the second phase programmes proposed below, once general professional training has been completed.

Recommendation 2

The Academy’s key recommendation is the immediate introduction of **50 clinician scientist posts** per year, additional to existing SpR and

clinical lecturer posts, through which to nurture a cadre of research-led clinical academics in both specialist and generalist medicine by providing opportunities for the equivalent of at least two years of protected postdoctoral research. These posts would offer an attractive, clear, flexible and secure second phase of training for doctors who have demonstrated outstanding potential for research during their first, doctoral period of research training.

This competitively-entered scheme would be open to specialists and generalists alike and would have three key features:

- (a) prospective planning of academic and clinical training needs, on a flexible *ad personam* basis, through a national clinical academic training co-ordination committee;
- (b) dedicated clinician scientist national training numbers for those in hospital specialties to allow postgraduate deans to construct flexible clinical training supernumerary to existing SpR rotations that would usually lead to award of a conventional broad-based certificate of completion of specialist training (CCST); and
- (c) ‘tenure track’ status in the host medical school, with the security of mutual expectation that there would normally be smooth transition to a senior academic post after about five years, or about seven years for the small number of intending specialists entering directly upon completion of general professional training.

Funding for about 25 posts per year is already available from external sources and a further about 25 posts per year could be readily achieved through redeployment of existing university and NHS budgets, although new funds would greatly strengthen the initiative.

Recommendation 3

The Academy recommends the development of a **research training access scheme**: this would provide annually about 50 **research training access posts** for outstanding senior house officers (SHOs). These would offer doctors qualified for SpR training in ‘blocked’ specialties up to two years’ specialist training registrable against future

requirements (i.e. comparable to existing NHS-funded locum appointments for training [LATs]). The incorporation of up to 20% of time for preparation of research training fellowship applications under the sponsorship of an academic unit (which need not be in the chosen clinical specialty) would also address the additional disincentive of lack of research training environments in some disciplines.

Funding for this scheme could be made available through LAT opportunities arising from SpRs taking ‘time out’ for research, but redeployment of NHS salaries freed due to ‘lost NTN’s’ would strengthen the scheme. Moreover, given the importance of research-active doctors (whether employed by the NHS or universities) to the R&D function of the NHS, we suggest that the NHS R&D programme may also wish to contribute funds.

Recommendation 4

The Academy recommends **limited earmarking of fellowships, links with strong centres and academic access schemes** in order to promote research training in some disciplines. These measures would enable the development of research capacity in disciplines that are currently in difficulties because of lack of academic critical mass, such as some of the surgical disciplines, obstetrics and gynaecology, and primary care. We suggest that disciplines lacking in research training environments should encourage their growth by ‘lending’ research trainees to strong centres before nurturing their further development in their discipline/medical school base. The research funding agencies might collaborate with the proposed national clinical academic training co-ordination committee to offer a pro-active ‘*placement advice service*’ to promote such mobility.

Recommendation 5

The Academy recommends that there should be **as much flexibility as possible in the development of training programmes** to allow the conjoint development of research and clinical careers. This should apply particularly in those disciplines which require persistent patient contact and/or the development and maintenance of practical skills as an essential component of clinical training.

The Academy believes that there are three areas that require a flexible approach to allow the development of clinical academic careers. The first is the flexibility for clinician scientists to mix training in research and clinical medicine on an *ad personam* basis. The second is to enable trainees with domestic commitments to continue training during periods of heavy domestic commitments; many of whom will later change back to full time working. The third is to develop schemes to allow changes in clinical work patterns after entry to the specialist register.

Recommendation 6

The Academy recommends that **clinical lectureships must be retained**. The Academy views the proposed clinician scientist scheme as an attractive addition to the range of career opportunities available to academically-minded young doctors and a means by which to foster future leaders in clinical research. However, we emphasise that existing clinical lectureships recognised for honorary SpR training offer an important career opportunity and should be retained; wholesale conversion of clinical lectureships to clinician scientist posts is not our intention.

However, clinical lectureships in hospital specialties are of little value to academic medicine if the job plan is essentially that of a specialist registrar. During its enquiry the Academy has come across encouraging examples of close collaboration between universities and postgraduate deaneries to construct SpR rotations that ensure periods of protected academic time for clinical lecturers with honorary SpR status.

Recommendation 7

The Academy recommends **the need for improved clinical academic career track data**. The Academy strongly supports current efforts to improve data on the clinical academic workforce through implementation of comprehensive databases, such as those being developed by the Medical Research Council, the Wellcome Trust and the Department of Health (through AGMETS). However, the Academy stresses that remedial action to improve recruitment into academic medicine must not be delayed until such databases are in place and well validated.

- 1.5** The Academy concludes that clinical academic medicine can be made a more attractive career choice through relatively simple changes in the clarity, flexibility and security of training programmes.

2. Introduction

2.1 Clinical Academics: Research-led doctors vital for health care

Clinical academics are fully trained specialist or general medical practitioners employed by universities to undertake research, teaching of undergraduate medical students and clinical practice in the National Health Service. The latter not only involves personal responsibility for patient care but also requires active participation in the postgraduate clinical training of young doctors and varying degrees of involvement in clinical management. Furthermore, clinical academics also play important roles in national (e.g. the medical royal colleges, research councils, the General Medical Council, medical charities, and the British Medical Association) and international (e.g. European Union and World Health Organisation) medical affairs.

Research into the prevention, diagnosis and treatment of disease is a key activity for clinical academics and is increasingly seen as their *raison d'être*, despite major commitments to clinical teaching, clinical service and many other duties. This is because our leading universities, in which medical schools are generally sited, have become research-led. The government preferentially funds those universities that deliver internationally competitive research which can be drawn upon by industry and governmental bodies to improve the health and wealth of the UK. Medical schools are not exempt from the research assessment exercise (RAE - see below), the tool used by government to direct research funding to the best research groupings. Indeed, many clinical academics are keen for their careers to be research-led; thanks to recent advances in biomedical and health services research there has never been a brighter prospect of improving the clinical management of previously intractable disease.

Furthermore, increasing resource restraints have limited the traditionally important role in clinical research played by NHS doctors to the extent that clinical academics are becoming

ever more important as the 'research engine' of British medicine. Thus, inevitably society turns to clinical academics when serious and unexpected medical problems arise, such as HIV infection and AIDS, or BSE infection and new variant CJD.

Clinical academics now conduct clinical research with increasing rigour and professionalism, not least because they must frequently compete for research funds with university-employed basic scientists free from the demands of patient care. Indeed, clinical research is now more properly viewed as *clinical science* since it currently ranges from the basic science of discovery to the applied science of implementation and from the level of the molecule and the cell to that of the individual and the population. These complementary approaches are essential for the continued development and application of the new knowledge that leads to improvement in health care.

2.2 Poor recruitment and retention of staff continues to threaten clinical academic medicine in the UK

Over the last decade there has been growing concern that there are serious problems in attracting young clinicians into academic medicine. This is a discipline that adds the challenge of being competitive in research and active in teaching to the conventional demands of clinical medicine, such as long hours and very heavy responsibility.

As long ago as 1995 the House of Lords Select Committee on Science & Technology drew attention to the recruitment problems developing in clinical academic medicine [1]. It concluded that *'the disincentives to an academic medical career are now so great as to warrant an immediate enquiry in their own right'*. The government did not act on this recommendation but the Committee of Vice-Chancellors and Principals (CVCP) did take action, by commissioning an independent task force to address the problems highlighted in the Select

Committee report. Sir Rex Richards chaired the task force, which reported in July 1997 with a comprehensive list of 35 recommendations [2]. After hearing evidence from Sir Rex and members of the task force in November 1997, the Select Committee reported that *'we are persuaded more than ever that there is a genuine threat to academic medicine in the UK and therefore to health care as a whole'*.

In particular, the Richards task force uncovered disturbing evidence that the future of many disciplines within academic medicine is fundamentally threatened by an inability to attract suitably experienced candidates to senior academic vacancies, especially professorial chairs. Thus, Richards found that in 1995/6 it had not been possible to fill 56 clinical chairs. Indeed, in 19 cases, not one appropriate candidate could be found for the vacant post. Furthermore, the situation appears to be no better at present. For example, the Academic Board of the Royal College of Surgeons of England has expressed its continuing concern that there remains extreme difficulty in finding suitable candidates for even the most attractive and prestigious chairs in surgery (PR Bell, personal communication). Moreover, a survey in September 1999 (unpublished) jointly undertaken by the British Medical Association (BMA) and the Council of Heads of Medical Schools [3] found in a sample of 17 medical schools that 74 out of 401 established chairs were vacant. Just under half (36/74) had been unfilled for over a year.

2.3 New threats have arisen recently

Concerns fuelled by documented and long-standing difficulties in appointing suitable individuals to chairs have much increased over the last three years. New threats have arisen which, because of the length of the academic career path, will not exert obvious deleterious effects on senior clinical academic recruitment for several years. First, in hospital specialties new, well organised and shortened specialist registrar training programmes are likely to be more attractive to young doctors than the prolonged insecurity of training in clinical academic medicine (see 3.1 below). Secondly, there is worrying evidence of a recent fall in

the number of clinical lecturers in post, reducing the traditional seedcorn of clinical academic medicine in both hospital specialties and general practice (see section 3.3).

2.4 Remedial action is urgently required

Since publication of the Richards Report in July 1997 there has been little progress in improving the recruitment and retention of clinical academic staff. This is despite concerns expressed by several senior bodies, including the House of Lords Select Committee, the medical committee of the CVCP, the Council of Heads of Medical Schools and the medical academic committee of the BMA. Indeed, it is no exaggeration to say that virtually all those consulted in this enquiry (Appendix 2) identified the recruitment/retention issue as the single most important current threat to clinical academic medicine. Despite a widely acknowledged need for accurate and prospectively gathered data on clinical academic career pathways (see sections 3.6, 5.6) we encountered widespread opinion that remedial action must be started as soon as possible in order to forestall a worsening situation. As a result of these anxieties the Academy has already (in November 1999) submitted written evidence to the House of Lords Select Committee along the lines of this report [4]. However, before presenting our findings and recommendations it is necessary to provide some essential background details.

3. Background

3.1 The hospital specialist registrar grade: An evolving innovation that has left academic medicine behind

The implementation, from 1 January 1997, of the recommendations of the Calman report *Hospital Doctors: Training for the future* has resulted in major changes in the system of training hospital-based specialist doctors. The former grades of registrar and senior registrar, which in many specialties were traditionally separated by a period in research, were amalgamated into a single grade of specialist registrar (SpR).

This innovation has had many positive effects on the training of NHS consultants. The traditional ‘apprenticeship’ system has been superseded by more structured training, annually assessed against educational goals. There has also been a reduction in the time taken to achieve consultant status, qualification for the grade now being marked by award of a Certificate of Completion of Specialist Training (CCST). Figure 1 compares typical current

career pathways for doctors heading directly for a NHS consultancy, a principal post in general practice and an academic post. The length of training for the specialty depends on the requirements of the appropriate royal college for the specialty concerned; minimum training times vary between three years for psychiatry and six years for surgery with five years being common to many specialties. This brings the training for consultants closer to the career structure for general practice, where a GP now becomes eligible to be a trainer at around the same time as a specialist registrar can expect a consultant appointment.

Although ages and time from qualification vary widely among individuals, the typical course given shows that a NHS trainee in hospital specialties can hope to become a consultant by the age of 32 or 33 under the new scheme. This compares very favourably with the old system, which generally resulted in consultants being appointed around the age of 35 to 36, with some popular specialties appointing consultants at around 40 (Figure 1). However,

FIGURE 1

Approximate age (Years after qualification)	NHS Clinical Pre-Calman	NHS Clinical Post-Calman Hospital Primary Care		University clinical staff	Externally funded appointments
24 (1)	Pre-registration House Officer	Pre-registration House Officer			
25 (2)	Senior House Officer	Senior House Officer			
26 (3)					
27 (4)	Registrar		GP Registrar		
28 (5)		Specialist Registrar	GP Principal		Clinical Training Fellow
29 (6)				Lecturer	
30 (7)	Senior Registrar		Pay parity within partnerships		
31 (8)					Clinician Scientist
32 (9)					
33 (10)		Consultant	GP eligible to be a trainer		
34 (11)					
35 (12)	Consultant				
36 (13)				Senior Lecturer	Senior Clinical Fellow
37 (14)					
38 (15)					

Typical Career Pathways Pre- and Post- ‘Calman’

‘Externally Funded Appointments’ in this diagram is used as a shorthand term for ‘Clinical research workers funded other than from NHS or university sources’ The ages and years-after-qualification are typical, but vary a great deal.

this desirable acceleration in clinical training has highlighted the much less attractive length of training for a career in clinical academic medicine, which increasingly demands post-doctoral research experience at the clinical lecturer or intermediate fellowship level (Figure 1).

The SpR grade was intended to be flexible, allowing academically oriented trainees to spend time 'out of programme' in order to join in research. However, the speed with which the SpR grade was implemented has also given rise to a number of structural weaknesses, which actively threaten academic medicine:

3.1.1. The SpR grade is governed by NHS workforce needs

Since SpRs are expected to move into a consultant post within six months of obtaining their CCST, the number of SpRs appointed each year needs to be an accurate reflection of the number of consultant vacancies expected in five years or so. The management tool used to achieve this has been strict control of national training numbers (NTNs) awarded by postgraduate deans to those obtaining SpR posts. The extreme difficulty of making projections against a background in which promised consultant expansion remains unfunded has recently led to a crisis in obstetrics and gynaecology in which over 200 SpRs with CCST were unable to find a consultant post in 1999. The result was that very few new SpR appointments could be made. Similar difficulties are incubating in other specialties, which are increasingly 'blocked'. It is not clear how to ensure that there is 'trickle through' of doctors aiming for academic posts outwith NHS plans.

Furthermore, in order to balance supply of CCST holders with existing NHS trust demand for consultants, reductions in NTN allocations are being made in 'blocked' specialties. Such reductions may threaten the viability of clinical lectureships (see 3.3.3).

3.1.2 SpR programmes may include unduly proscriptive and inflexible requirements

The royal colleges, acting through their specialist advisory committees (SACs) were charged by the Specialist Training Authority (STA) to devise and implement curricula for SpR training programmes. This work had to be done rapidly but in circumstances in which the means to assess competence were poorly developed and validated. It is a widespread perception that the curricula initially introduced in many specialties may be overly proscriptive. Thus attempts to ensure competence often involved a requirement to perform large numbers of supervised clinical procedures in a rigid temporal framework, which may not be compatible with the flexibility required by clinical academic trainees (see 4.1.2).

3.1.3 SpR programmes rely on salary elements tied to location

Except in Scotland, half the salary of SpR posts is provided by the NHS trust hosting the trainee, the other half deriving from the postgraduate dean's budget. Many regional SpR programmes were constituted pragmatically from existing registrar and senior registrar posts originally funded by host hospitals in the relevant region. Therefore, many SpR rotations can only function if trainees are 'tied' to particular hospitals. One unfortunate result is that a specialist registrar keen to maintain research undertaken during an 'out of programme' research training fellowship may be forced to undertake periods of clinical training in hospitals distant from their research base. This makes it very difficult for them to maintain their research activity.

3.2 Academic careers in general practice are also in difficulty

The situation is somewhat different in general practice which is still developing as an academic discipline and as yet has no training numbers. The current minimum training time for general practice remains three years, including SHO posts, but decreasing numbers of registrars are taking up principalships around the usual age of 28, preferring to seek

more clinical experience, often as non-principals. The net result remains the same as for specialist medicine. However, the long period of research training at registrar level contrasts unfavourably with the short period of compulsory training for principal status.

In April 2000 the general practice registrar training budget will move from general medical services to the budget of the postgraduate deans, which may offer increasing or decreasing flexibility in training depending on interpretation. What is clear is that early assumption of a principalship with its heavy responsibilities and requirements for accessibility to patients, militates against in-depth research training at the most appropriate time. Yet postponement has severe consequences for clinical status, seniority awards and pensions. Solutions will depend on close working between academic and service GPs within the new system for managing the workforce in primary care, which will link primary care groups through health authorities to the regional education and teaching consortia and on to the Specialist Workforce Advisory Group (SWAG).

3.3 Clinical lectureships: academic seedcorn under threat

Inability to recruit professors is only one symptom of a more deep-seated disorder in academic medicine. Recent data also suggest that there is an inexorable decline in the numbers of young doctors holding clinical lectureships, the traditional seedcorn of academic medicine.

3.3.1 A traditional pathway to academic medicine and other destinations

Clinical lectureships are university posts usually held for three to five years by young doctors with some experience of research who hope to combine clinical work (which in hospital specialties usually leads to completion of specialist training) with further research and teaching experience. The intention has been that clinical lecturers should become competitive for clinical senior lectureships, the first permanent rung on the academic ladder

for doctors, which is linked with honorary consultant status in hospital specialties (posts confusingly called 'university lectureships' in Cambridge and Oxford). Indeed, clinical lectureships serve as a 'bridge' to academic medicine, since they offer a chance to consolidate both research and clinical experience. This is particularly important in disciplines requiring persistent patient contact, such as surgery or general practice, or where research proceeds slowly, as in randomised controlled trials.

However, for many years there has been appreciable but unquantified leakage of potential clinical academics into the NHS, since clinical lecturers have frequently preferred not to apply for clinical senior lectureships, moving instead into posts as NHS consultants or principals in general practice. Therefore, in a climate in which new disincentives against an academic career have arisen (see section 3.5 below), a fall in the number of clinical lecturers can be expected to be doubly deleterious, leading in a few years to even greater difficulties in recruiting senior clinical academics.

3.3.2. The research assessment exercise threatens clinical lectureships

The Richards report drew attention to the pressures on universities and their medical schools inherent in the periodic research assessment exercise (RAE). This is undertaken by the UK Higher Education Funding Councils (HEFC) in order to ensure that best use is made of public funds underpinning university research - monies are preferentially directed towards those units of assessment within universities judged to be undertaking internationally excellent research. For a given rating, the greater the number of university staff returned within each unit of assessment, the greater the absolute sum of money awarded. A decision not to return a staff member as research-active inevitably leads to loss of funds unless this results in a net increase in research quality with the result that the unit receives a higher grade.

The rules of the RAE have put particular

pressure on the clinical lectureship grade. By contrast with lectureships in other academic disciplines, clinical lectureships are training rather than career posts. However, their research output is judged by the same criteria, even though individuals with little research training and no track record may hold clinical lectureships in some disciplines. It is clear from this enquiry that heads of medical schools have been under pressure to disestablish clinical lectureships in order to reconstitute them as posts suitable for individuals with a strong research record, increasing research quality without the financial penalty of reducing the number of staff in the unit of assessment. Furthermore, available data support these conclusions (see 3.3.4).

3.3.3 Reductions in NTN allocations also threaten clinical lectureships

The vast majority of clinical lectureships in hospital specialties offer honorary SpR status, in that they are held by individuals holding an NTN, so that the clinical training provided (which must be a minimum of 50% of time) contributes towards the higher training necessary for award of CCST in the relevant specialty. Indeed, in many cases, clinical lectureships are incorporated into SpR rotations.

As outlined above (3.1.1) underfunding of planned consultant expansion has resulted in SpRs being unable to find consultant posts in certain specialties. The Department of Health has responded by announcing phased reductions in NTN allocations to 'blocked' specialties. For example, in paediatrics and child health the current stock of some 1,250 NTNs will be reduced by 100 per year to about 750 in five years time. Such large reductions threaten the viability and attractiveness of clinical lectureships in 'blocked' specialties because, as the post holders move on to career grade posts, it may not be possible for the postgraduate dean to award an NTN to the new appointee.

3.3.4. Evidence of a fall in the number of clinical lectureships

An enquiry was carried out by the Council of Heads of Medical Schools into changes in the numbers of clinical lecturers in a sample of 11 UK medical schools. This revealed that over the two year period from 1995/6 to 1997/8 there was a 7.6% fall in the number of doctors holding posts as clinical lecturers, reflecting disestablishment of 10.5% of the 1995/6 stock. We also encountered widespread anecdotal evidence that funds formerly supporting clinical lectureships are being 're-routed' to provide posts for career grade staff likely to make stronger research contributions and thereby protect or enhance the unit's RAE rating (e.g. by upgrading to clinical senior lectureships or conversion to non-clinical lectureships).

3.4 Research funding agencies have stepped in to aid clinical academic career development

In recent years the two most important funders of biomedical research in the UK, the Medical Research Council (MRC) and the charitable Wellcome Trust have led the way in setting up, for medical and dental graduates, a comprehensive portfolio of opportunities for research training and career development. Several other major medical research charities, such as the Cancer Research Campaign (CRC), the Imperial Cancer Research Fund (ICRF), the British Heart Foundation (BHF) and the Arthritis Research Campaign (ARC) have followed suit. Indeed, since the inception of the NHS research and development programme, the NHS has also developed a particular interest in funding the career development of those interested in health services research. All of these bodies have recognised that maintaining and developing the clinical academic workforce in their areas of interest is the surest way of ensuring a future in which ground-breaking clinical research continues to lead to improvements in patient care. It is also implicit in these developments that such research funding agencies have recognised that the opportunities for research offered by existing NHS and university training posts must be enhanced.

3.4.1. Research training fellowships: the ideal start

The experience of research funding agencies is that young doctors have not lost interest in research. There continues to be strong competition for the 150 or so research training fellowships available each year which provide around three years of well-designed, well-supervised full-time research training; the ideal first step in the development of an academic career. Indeed, it is a widespread perception that in the last few years previous tenure of an externally-funded research training fellowship leading to a PhD or MD research degree has become the rule rather than the exception for new appointees to senior clinical academic appointments in the stronger disciplines.

3.4.2. Intermediate level fellowships: the next step for a few

Although research-funding bodies have recognised the importance of post-doctoral research training in the career development of clinical academics (often abroad or away from base), opportunities for post-doctoral intermediate level fellowships are few in number. In part, this reflects the evolution of such fellowships as a means to maintain a cadre of very able young clinical scientists to serve as candidates for senior clinical fellowships (see 3.4.3). However, the limited number of such awards also reflects their greater cost. Not only is the intermediate fellow's salary provided for up to five years (during which time many fellows finish clinical training and are paid as honorary consultants) but also there is often the award of full consumable costs and technician support. Indeed, in highly sought-after intermediate fellowships styled as *clinician scientist programmes*, bodies such as the MRC and Wellcome Trust will allow significant time out of the research programme to continue/complete clinical training - some five year Wellcome fellows may spend as much as 40% of their time in clinical work. Nevertheless, these privileges are for the few - although the MRC seeks to appoint nearly 50 research training fellows annually, recent years have seen about 10 clinician scientist appointments each year. The quality of intermediate fellows

is therefore very high; although intermediate level fellowships might be viewed as being broadly equivalent to clinical lectureships, we are aware of a number of intermediate fellows who have proceeded directly to clinical chairs.

3.4.3. Senior clinical research fellowships: the 'jewel in the crown'

Each year a very small number (e.g. four per year at the MRC) of outstanding clinical scientists secure highly sought-after senior clinical research fellowships. These enable them to build internationally significant programmes of research over a five to 10 year period without the heavy clinical and teaching commitments typically borne by those in the senior clinical lecturer grade. Senior fellows are very attractive targets for proactive search committees seeking to fill chair vacancies.

3.5 Given research funding agency support, why should there be a problem in recruitment?

It should be obvious that clinical academic medicine owes a large debt of gratitude to UK research funders but it may seem surprising that there is strong competition for fellowships on one hand, while on the other there is a dearth of senior candidates for university academic vacancies. A number of factors contribute to this apparent paradox:

3.5.1. Fellowships are limited in number

Although career track analysis and workforce planning in clinical academic medicine are beset with a lack of hard data (see 3.6 below) it should be obvious that externally-funded career development programmes cannot meet demand. In the quite justifiable pursuit of excellence, research funders find it cost-effective to concentrate on a small number of outstanding investigators; only 10 or so senior clinical fellows are appointed each year by the MRC, Wellcome Trust and other funders. This represents a very small stock of clinical scientists which cannot possibly ensure that all existing clinical chairs in 24 established undergraduate medical schools and the three new schools are kept filled, let alone fuel expansion of newer clinical academic disciplines.

3.5.2. Some disciplines win few fellowships

Certain disciplines within academic medicine seem much more successful than others in obtaining external career development awards. For example, in the Goldacre et al 1997 sample [5], 67% of research training fellowship holders had career aspirations in the sub-disciplines of internal medicine, whereas only 7% and 1% respectively were planning careers in surgical disciplines or obstetrics and gynaecology. Indeed only one individual was identified who was aiming for a career in academic anaesthesia, despite this specialty having the largest consultant body in the UK.

Similarly, MRC data for 1997/8 showed a comparable distribution of fellowships according to intended clinical specialty amongst a sample of 201 fellows in post - 9% in surgical specialties, 3.6% in obstetrics and gynaecology and only 1.5% in anaesthesia compared with nearly 60% of fellows aiming for medical specialties. Importantly, applications to MRC in 1997/98 exhibited a very similar distribution by specialty, supporting a widely held view that some specialties obtain few fellowships because few applications are made. Applications from general practice remain very few in number.

3.5.3. Strong disincentives operate after the first fellowship

A central theme of this report is the identification of disincentives which lead enthusiastic research training fellowship holders to prefer a career in the NHS (see section 4 below). A number have arisen since the implementation of the specialist registrar grade, which is discussed above (section 3.1). However, at the time the grade was implemented there was already strong evidence that young doctors starting in research face strong disincentives against continuing in an academic career.

In order to identify disincentives operating at the time of their enquiry (1996/7), the Richards task force took great pains to interview many trainees in academic medicine. These data were subsequently amplified in a questionnaire

survey conducted with the help of the UK Medical Careers Research Group and published in 1999 [5]. The two factors most frequently identified in this study, as deterring young doctors from a career in academic medicine, are particularly interesting:

The prime concern expressed by trainees was that *their training would not equip them to achieve competitiveness in obtaining research grants*, which they viewed as a prerequisite for sustaining a career as a credible clinical academic. In fact, in recent years it has become increasingly recognised that to become capable of maintaining an externally-funded programme of research, clinical academics not only require a two to three year full time period of doctoral research training but also need to supplement this with at least two years of post-doctoral research as they work towards scientific independence.

The uncertainty of pay parity with colleagues in NHS careers was the second greatest disincentive. This concern was subsequently ameliorated in large part by the government's agreement that clinical academic remuneration should be tied to NHS salaries of the same clinical seniority (DfEE 'condition of grant' letter Nov 1996). Nevertheless trainees under taking research training still make financial sacrifices at a time when many have young families to support. Thus, recent BMA data (C Smith, personal communication) indicate that, in comparison with contemporaries who remain in NHS posts, doctors undertaking a three year research fellowship sacrifice around £25,000 of life-time earnings at a time when they can ill afford to do so. Furthermore, such doctors must also accept reduced financial assistance with removals, study and maternity leave etc. as they are usually employed by universities under less favourable terms and conditions than those offered by the NHS.

3.6 Career track complexity and lack of comprehensive data

Since publication of the Richards report it has been apparent that the nation lacks accurate data on the career track of doctors who have worked or still work in clinical academic

medicine. This deficiency was recently highlighted by Mr John Denham MP, Minister of Health [4], who has asked that accurate data on clinical academics are obtained as soon as possible.

We also recommend that this situation is remedied as quickly as possible (see 5.6 below). However, the problem is complex. For example, a senior house officer undertaking a research training fellowship prior to obtaining a NTN is usually employed by a university and does not feature on Department of Health databases, in particular, that governing the SpR grade. Furthermore, although the MRC and Wellcome Trust have set a lead among research funding agencies in following the career paths of their fellows, prospectively gathered data are unlikely to reveal the effects of current disincentives upon choice of career grade post for several years, given the need for those leaving first research training fellowships to complete clinical training. Consequently, in this report we outline the requirements of a database that would reveal the difficulties and concerns that we have encountered (see 5.6 below).

3.7 The Academy of Medical Sciences

3.7.1. A new body that draws academic medicine together

The Academy of Medical Sciences was established in 1998 to encourage the pursuit of clinical science and its application to patient care. It now has 450 fellows drawn from all branches of academic medicine and medical science. The wide expertise of the fellows enables the Academy to represent authoritatively the interests of academic medicine across traditional clinical and scientific boundaries. This is important because other bodies either have a more circumscribed remit or are constrained by additional responsibilities. Indeed, despite their sympathetic interest in the problems of clinical academic recruitment, it is evident that they have not been able to prevent or reverse the worrying trend in clinical academic recruitment. For example, although the British Medical Association has been able to help

through its focus on protecting the professional status of doctors, even the hard-won guarantee of comparable basic remuneration in the NHS and clinical academic sectors has not prevented growing difficulties in filling clinical chairs. Similarly, the potential impact of the royal colleges has been constrained by the traditional limitation of their role to particular specialties, although the Academy of Medical Royal Colleges provides an important ally for the Academy of Medical Sciences in matters relating to professional standards. Nevertheless, no single body other than the Academy of Medical Sciences (called ‘the Academy’ hereafter) can fulfil a much needed overarching role.

3.7.2. Working party on career structure and prospects for clinical scientists in the UK

A major concern for the Academy of Medical Sciences is the overall health and vitality of the clinical academic profession which, it believes, is critical to the advancement of both biomedical research and the practice of clinical medicine. It is conscious (and proud) of the current high reputation of the UK in this field but aware of how easily this position could be lost. While endorsing the wide ranging recommendations put forward in the Richards report [2], the Academy considers that the most urgent issues for it to address are those affecting the clinical and research training of aspiring clinical academics. As we have already pointed out there is widespread concern that the recruitment of young, talented, research-minded clinicians into UK academic medicine is insufficient to maintain the current impetus and standard of medical research in the UK and the translation of this into improved patient care. In order to stimulate action to sustain the clinical academic workforce in specialist medicine and to help establish it in generalist medicine, the Academy established a working party (membership in Appendix 1) with the following terms of reference:

1. to assess any barriers to academic training associated with recent changes in clinical career structure

2. to develop constructive suggestions for developing career pathways for trainees in academic medicine

3.7.3. A focus on nurturing research-led academic clinicians

The working party's objective in addressing these tasks was to find ways to increase the attractiveness of clinical academic medicine as a career choice, thereby improving the quality and number of research-led, university funded clinicians in all major clinical disciplines. In particular, we want to see a strengthening of the essential cadre of academic clinicians who practise medicine in the 'front line' of hospital medicine or primary care, since these practitioners are best placed to bring research-based improvements into clinical care and to inspire young doctors to develop an interest in research. In hospital specialties we anticipate that the vast majority of academic trainees should seek a 'conventional' broad-based CCST. However, we do see value in retaining the academic and research route for entry to the specialist register for that small number of clinicians who wish to have a very limited clinical practice to serve as a basis for an almost full-time commitment to research. Such individuals are not infrequently innovators whose work leads directly to the introduction of new diagnostic or therapeutic procedures in medicine.

Our focus has been on nurturing research-led academic clinicians. This should not be misinterpreted as indicating that such individuals will not teach undergraduate medical students. On the contrary, we are of the opinion that much of the most stimulating teaching in our medical schools is delivered by clinical academics inspired by their research. However we also believe that it is appropriate that there should be a small body of clinical academics who have teaching as their top priority.

We have not addressed the problem of the experience in research desirable for SpRs or GP registrars interested primarily only in a NHS career, whose training must at a minimum prepare them to be 'research aware', given the

key role of research and development in today's NHS. Indeed, we feel that the nation's best interests would not be served if every career grade clinician undertook a prolonged period of research. Nevertheless, our recommendations (see 5.2.1 below) do encompass the important body of 'research-active' NHS clinicians who have undertaken periods of full-time research during their training. Furthermore, we believe that an essential part of the training of all clinicians should include formal education in approaches to the identification of research questions and the methodologies for answering these. Doctors in all branches of medicine should have the critical abilities to assess the findings of clinical research and to appreciate the essential nature of clinical practice based on robust evidence. The medicine of tomorrow will depend on the collection of large amounts of accurate data on all aspects of the clinical care of patients and the outcomes of disease. Large trials are needed to evaluate old and new treatments and it is essential that all members of the profession will have the ability to participate in rigorously designed and conducted research and evaluation protocols. We consider that there should be formal courses as part of SpR training schemes to teach these skills. Part-time MSc schemes might be one method of providing such training, which could deliver a combination of generic training in research and evaluation skills and subject-specific training appropriate to the speciality of the trainee. However, such schemes should not be imposed as yet another rigid requirement, as individuals winning research training fellowships already receive such training.

3.7.4. Mode of working

The working party met four times during 1999 to discuss new ideas and plan this report. We consulted a number of key individuals or groups in person (Appendix II) and received written evidence and opinion from many others involved in academic medicine (Appendix II), work which was greatly facilitated by the Federation of Associations for Clinical Professors. We also undertook wide informal consultation amongst our colleagues especially those in the training grades. The Richards report was used as a source of data.

4. Disincentives to a career in academic medicine

Wherever possible, we attempted to take a ‘bottom up’ approach to the problem of recruitment into academic medicine, doing our best to find out how the discipline appears to those contemplating an academic career. We have identified ‘generic’ disincentives (4.1) and problems in particular specialties (4.2).

4.1 Three key disincentives apply in all disciplines

4.1.1. The lack of a clear career structure in clinical academic medicine

The current career structure in clinical academic medicine compares poorly with the apparently straightforward path to a permanent post offered by clinical training schemes. In general practice, vocational training has long offered a clearly understood and efficient path to principal status. Similarly, in hospital-based disciplines recent implementation of the specialist registrar (SpR) grade now offers young senior house officers (SHOs) the attractive opportunity for a smooth passage through clinical training leading to CCST and a consultant post. By contrast we have encountered widespread uncertainty among young doctors and their clinical mentors as to how to construct a training programme in academic medicine in both hospital specialties and general practice.

4.1.2. Insufficient flexibility in combining clinical and research training

Training in clinical academic medicine should produce individuals who have (i) acquired the doctoral and post-doctoral research training necessary to flourish as competitive independent investigators and (ii) undertaken the first-class clinical training needed to practise the highest standards of clinical medicine. Considerable difficulties can be encountered by trainees who have undertaken a research training fellowship and then seek to combine clinical and research training in a mix most appropriate to the aspirations of the individual and the requirements of their specialty. Instead, many trainees completing a

research fellowship find that their clinical training is governed by the rigid structures and rules of their SpR programme or an inflexible and often unrealistic clinical lectureship job plan. Furthermore, such difficulties in hospital specialties are often compounded by assessment of clinical training in terms of time served or numbers of procedures completed rather than competence gained. This may be exacerbated by a requirement for SpRs to rotate away from their research base. In general practice, in which principal status can be achieved at a stage comparable to that reached by a second year hospital SpR, lack of flexibility derives particularly from difficulties in retaining principal status while pursuing an academic career.

4.1.3. The prolonged insecurity of clinical academic training

Prolonged insecurity compared with contemporaries has resulted from implementation of shortened SpR training coupled with a growing realisation amongst the best clinical academic trainees that post-doctoral research training is essential before they seek a senior academic post (see Fig. 1). For an individual going to medical school at age 18, six years may be required at medical school (to include a year for a BSc), at least three years in house officer/SHO posts, five years in SpR training and five to six years in research training, with the result that the first permanent post is not achieved until the age of 37 to 38. Some school contemporaries will be about to see their own children go to university, while medical classmates may have been practising as a consultant for six years or a principal in general practice for about 10 years. Indeed it is remarkable that the drive and motivation to undertake research and improve health care is so strong that some individuals have been prepared to accept such insecurity for so long.

4.2 Additional disincentives operate in some disciplines

4.2.1 Pressure to commence research training at the end of general professional training

In order to gain entry to SpR programmes in many popular hospital specialties, bright SHOs completing their general professional training are effectively forced into undertaking pre-SpR doctoral research training in order to enhance their competitiveness by obtaining a higher degree 'ticket' to SpR training and a much-prized national training number (NTN). This new trend is doubly undesirable. First, on completion of a PhD/MD the trainee faces around five years of clinical training during which competitiveness and interest in research are very likely to wane unless post-doctoral research training can be worked into the programme leading to CCST. Second, the young clinician may not be certain of the specialty in which they wish to practise, so unwise choices of research training can be made.

4.2.2 Lack of research training opportunities and environments in some disciplines

Although small, highly motivated research groups can provide excellent research training, research funders are increasingly recognising that the best training opportunities are to be found in large, interdisciplinary research teams which are at, or close to, 'critical mass'. Unfortunately, in many small clinical disciplines such research groupings simply do not exist, while anaesthesia and general practice are examples of large disciplines with very few academic practitioners, despite potentially exciting opportunities for research should an adequate infrastructure and mass of researchers be achieved. Consequently, it can be very difficult for trainees to access the appropriate advice and environments necessary to make a start in research. The closely related problem of some disciplines winning few research fellowships has been mentioned above (3.5.2).

Furthermore, even large research groupings may need help in introducing new

developments into their research programmes and training opportunities. Despite a strong academic record in cardiology in the UK, the Wellcome Trust perceived a need to establish a cardiovascular research training initiative to promote incorporation of cutting edge molecular and cellular research into the training available to young doctors interested in cardiovascular disease. Furthermore, provision of training environments in which to nurture a vanishing breed of bedside researchers was a key objective in the Trust's £16m scheme to establish five clinical research facilities in major university hospitals.

4.2.3 Problems with remuneration in some disciplines

Brief reference has been made above (3.5.3) to the financial penalties incurred by undertaking a three-year research training fellowship early in a clinical career. Since academic training more frequently requires prolonged periods as an intermediate/post-doctoral fellow or clinical lecturer on training grade salaries, young clinical academics face a growing loss of earnings relative to their NHS contemporaries at a time when many of them have young families. Indeed, relative disparities in remuneration may prove impossible to bear in those specialties in which private practice income is also readily available. During this enquiry we received opinions supporting this view particularly from colleagues in disciplines such as surgery and obstetrics and gynaecology.

In relation to general practice solutions need to be found to the difficulties with holding principal status and senior academic positions, or clinical academics will continue to lose access to seniority awards, postgraduate education allowances and the benefits of independent contractor status. At the same time, continuing debarment from consideration for distinction awards is seen by deans as an important disincentive to the filling of professorial positions in general practice [2]. Because of this anomaly many senior clinical academics in general practice continue to suffer significant financial disadvantage compared with specialist

academic colleagues, despite often working at comparable national and international level.

4.2.4 Difficulties in providing flexibility in particular disciplines and for particular trainees

Some disciplines require persistent patient contact:

Many of the most demanding clinical disciplines (not solely the surgical specialties but increasingly medical specialties such as cardiology) require trainees to acquire and maintain a high level of practical skill in clinical procedures. Maintenance of such skill requires its frequent and repeated use and this may limit the flexibility available for trainees to undertake 'blocks' of full-time research. Indeed, trainees returning from research may be faced with a need for intensive 're-entry programmes' before they are viewed as having retrieved the clinical skills necessary to continue their training towards a still more distant CCST. Similar inflexibility exists in general practice, which is defined by continuity and accessibility of care.

Trainees with domestic commitments: Trainees (usually women) who have to take additional time-out or periods of part-time work to fulfil domestic responsibilities may also face particular problems. Given that the proportion of doctors who are women is steadily increasing, opportunities for flexible training are essential if sufficient doctors are to be trained and retained in clinical academic medicine. Already, 96% of female and 51% of male medical students questioned in a 1996 survey have said that they would consider undertaking flexible training in the future [6]. Unfortunately, this enquiry has revealed concerns that the established mechanisms for flexible training are ill suited to combining clinical and research training.

Changing clinical activity after entry to the specialist register: A third problem that may limit the freedom to develop an academic career in some specialties relates to the current mechanism of entry to the specialist register. This does not allow the option of extension of training after a consultant position has been achieved. For example, there is currently no means for a doctor, accredited in

rheumatology, but not general internal medicine, to gain additional accreditation after appointment to a consultant post. In the past it was possible, and indeed commonplace, for a doctor to extend his or her areas of clinical practice after appointment as a consultant, frequently led by his or her research interests. Furthermore, NHS trusts, conscious of their proper responsibilities in risk management and clinical governance, may feel reluctant to allow consultants to extend their clinical practice, even if proper training could be obtained in the new area of clinical practice. Such problems may be particularly burdensome for the very small number of academic trainees who seek to enter the specialist registrar through the academic and research route. The trainee is put forward by a royal college to the Specialist Training Authority, which, after assessment of the relevant paperwork, may agree that the trainee is fully trained to practise in a particular sub-area of clinical activity. This offers the opportunity for an academic trainee to tailor a clinical training programme in line with his or her research skills. However, this route offers considerable risks to trainees as it tightly constrains the subsequent area of clinical practice as a consultant.

5. Proposed solutions to the disincentives

5.1 Early experience of clinical research

In making our recommendations we have concentrated on solutions for research-minded doctors who have completed their general professional training (i.e. one year of house officer and a minimum of two years of SHO posts). However, the importance of early exposure to research cannot be over emphasised.

There is strong evidence [7] that later achievement in clinical research is promoted by a period of research training at medical school. This is achieved through an intercalated BSc, or as an integral part of the undergraduate curriculum, leading to BMedSci at some schools, BA in Cambridge and Oxford, and BSc at Imperial, where all students will spend an extra year to complete a BSc. Indeed, following the recommendations made by the General Medical Council in *Tomorrow's Doctors*, UK medical schools have been stimulated to review their curricula to include special study modules and problem based learning projects that are also likely to stimulate later enquiry and research. Nevertheless, we welcome recent changes in the funding of higher education which have protected the opportunity for medical students to undertake intercalated BSc studies where this is appropriate.

Interest is also growing in providing MB/PhD programmes. These enable exceptionally talented medical students to complete undergraduate medical training and a PhD in about 7.5 years, since this model of stimulating interest and expertise in research has been successful in promoting the development of clinical researchers in the United States. However, there has been no clear route by which MB/PhD graduates can return to research sufficiently rapidly that their PhD studies are not 'out of date' while continuing clinical training after the compulsory general professional training period. Provision for such doctors is proposed below (5.3.1).

We recognise that the general professional training period, i.e. the house officer and SHO posts (which correspond to the hospital-based training in current vocational training schemes for general practice) should offer intensive consolidation and development of clinical skills acquired at medical school. Nevertheless, we have encountered very strong support for the view that during this period the opportunity to work with clinical academics and/or research-active NHS clinicians may be formative, inspiring young doctors to question current knowledge, undertake a small research project and decide that they wish to undertake a research training fellowship later in their career.

However, we are anxious to emphasise that the current discussion on the length and composition of general professional training must include careful consideration of the needs of research-minded doctors. In particular, SHO training that cannot count towards later specialist training requirements must not be compulsorily extended simply because of growing difficulties in entering the SpR grade.

5.2 A two-stage academic career structure after general professional training

We are broadly supportive of the two stage career structure recently proposed by the Royal College of Physicians of London [8], although we believe that these new proposals should not be interpreted as a rigid structure:

5.2.1 A first 'doctoral' phase

We regard it as a *sine qua non* that the first step in a clinical academic career should be at least two and preferably three years of full-time research training. Generally, this will be obtained by winning, in open competition, a MRC/research charity/NHS research training fellowship (RTF). It appears essential that general professional training should have been completed before undertaking the fellowship but it should be recognised that some

individuals completing general professional training will already have completed three years of research training, most usually by having completed an MB/PhD programme at medical school. Provision for this group is discussed below (5.3.1).

Doctors aiming for hospital specialties: As explained above (5.2.1), there is considerable merit in academically-minded trainees under taking a first fellowship from the secure position of having entered and completed one to two years of a conventional SpR programme. This ensures that the trainee has made a firm choice of specialty. It also offers an important ‘safety net’ for those who subsequently decide they would prefer not to go further in clinical academic medicine, since they can simply re-enter the SpR grade upon completion of their fellowship and then seek NHS consultant posts once a CCST is obtained. Nevertheless, we believe that such individuals may still play key roles in the UK clinical research infrastructure as ‘research-active’ consultants. However, some individuals will be ‘ready’ for research before entering the SpR grade, while others will not be able to enter SpR training because this is ‘blocked’ in their specialty. Provision for these doctors is discussed below (5.3.1).

Doctors aiming for general practice: Although academic general practice is a young and evolving discipline, it is increasingly common for academically-minded trainee generalists to undertake their first period of research training soon after completion of vocational training and success in examinations for the MRCP diploma. However, difficulties in gaining access to three-year research training fellowships have been described above (3.5.2 and 4.2.2) and receive attention below (5.5.2).

5.2.2 A second ‘post-doctoral’ phase

Our key proposal, the introduction of a new tenure-track clinician scientist grade, is discussed in the next section. However, it is important to emphasise that existing mechanisms are available to provide doctors ‘bitten by the academic bug’ with the combination of post-doctoral research training

and clinical training leading to completion of CCST, the key objectives of the proposed second phase of clinical academic training [8].

First, it may suit some individuals to take a second period of ‘time out’ at a later stage of conventional SpR programmes in order to undertake an intermediate/post-doctoral fellowship. Second, a move into a clinical lectureship post with honorary SpR status and a job plan offering dedicated sessions or blocks of time for research may be attractive to other individuals (see section 5.4), although external funding will need to be obtained to cover research expenses.

However, we feel that neither mechanism offers the optimum clarity, flexibility and security necessary to overcome the serious ‘generic’ disincentives we have discussed. Indeed, the current situation seems to ensure that our most talented and innovative trainees have the greatest difficulty in achieving their career aims. Therefore, we were very encouraged that during our consultations we encountered widespread support for the introduction of a new, additional ‘third way’.

5.3 Our key proposal: The tenure-track clinician scientist

It is essential that young doctors with outstanding research potential demonstrated during their first period of research training should be able to compete for posts which offer a clear structure for career progression, a flexible mix of clinical and research training to suit individual needs and the security to encourage such doctors to remain in training until they are around 38 years of age. The aim is to nurture a cadre of research-led clinical academics capable of leading the revival and/or development of their discipline. We recommend immediate introduction of a new, competitively-entered clinician scientist scheme with the following key features:

- National co-ordination of clinical and academic training
- Dedicated clinician scientist NTN for trainees in hospital specialties
- Tenure-track status

5.3.1 National co-ordination of clinical and academic training

The proposed clinician scientist scheme should be regarded as a national resource. However, current protocols for supervision of clinical training rely on regional mechanisms which cannot be expected to provide consistent expert guidance for a very small number of academic trainees. The greatest flexibility would derive from a system which enabled each trainee to agree a prospective but revisable *ad personam* programme for combination of post-doctoral research with high quality clinical training.

We propose the establishment of a national clinical academic training co-ordination committee, which could be ‘piloted’ for the 27 medical specialties by the Royal Colleges of Physicians since the Joint Committee on Higher Medical Training already has an academic and research group. However, it appears desirable to work towards a single committee that would encompass all hospital specialties and general practice.

The functions of such a committee would be:

- (a) to ensure that individuals taking up clinician scientist posts do have appropriate academic credentials: in particular, that they have demonstrated outstanding potential during a research training fellowship or a PhD programme at medical school;
- (b) to recommend the award of a national clinician scientist NTN to doctors aiming for hospital specialties (see 5.3.2) - the fact that NTNs are not required in general practice will not, of course, exclude generalists from the scheme;
- (c) to advise and assist trainees and postgraduate deans on the composition of *ad personam* programmes offering the optimum mix of full and/or part-time research and clinical training for each individual; and
- (d) to liaise closely with the relevant specialty advisory committee (SAC) to ensure that proposed *ad personam* programmes meet that specialty’s requirements and that the trainee continues to undergo assessments which will allow the SAC to award a CCST in due course.

We applaud the moves now being made by various bodies to investigate competency-based assessment of fitness to qualify for specialist registration, rather than measures dependent on time served, numbers of procedures undertaken and formal examinations passed. We are aware of the difficulties and dangers of moving in this direction but it could undoubtedly help to introduce still more flexibility into clinician scientist programmes.

We anticipate that most clinician scientists will have undertaken at least two years of SpR training. The scheme will therefore need to be about five years in length in order to accommodate the equivalent of the final two to three years of clinical training and two to three years of post-doctoral research experience. However, the scheme could be extended to accommodate the equivalent of a full SpR programme for that very small number of individuals who have demonstrated outstanding potential during a pre-SpR scheme research training fellowship or a PhD undertaken at medical school before completion of general professional training.

5.3.2 Dedicated clinician scientist NTNs for those in hospital specialties

We have encountered widespread acceptance of the suggestion that a small cadre of outstanding trainees heading for careers in clinical academic medicine could be regarded as ‘supernumerary’ to NHS workforce planning, since they will spend their careers in universities rather than the NHS. Indeed, if such academic trainees hold a conventional NTN for over 10 years they will be frustrating NHS planning and the career aspirations of doctors aiming for consultant posts. These difficulties would be easily overcome by enabling our most promising trainees to give up their existing conventional NTN and take up a clinician scientist NTN instead. Not only would such ‘supernumerary’ status enable postgraduate deans to keep trainees close to their research base but it would also facilitate management of clinical training (see 5.3.1) and tenure-track status (see 5.3.3).

The release of the conventional NTN by the clinician scientist would also go some way to alleviating the difficulty of appointing trainees with new NTNs to specialist registrar posts which have been vacated by those moving from clinical to research training. The move from clinical to research training is made frequently by trainees occupying, at the time of transfer, SpR posts in teaching centres. These SpR posts have been recognised to provide excellent clinical training as part of rotations. However, because of workforce constraints, such vacated SpR posts can only be filled by doctors prepared to accept one year locum appointments for training (LAT) or shorter 'non-registrable' locum appointments for service (LAS), which are non-training grade appointments. The loss of the ability to appoint high-flying trainees to SpR posts in training centres may further diminish the number of junior doctors trained in an academic environment which encourages the intellectually curious to enter research training. The development of two additional cadres of research trainees (academic trainees with clinician scientist NTNs and SHOs in the research training access scheme [see 5.4.1 below]) would allow many of these posts to be filled with new trainees of the highest calibre.

Until such time as prospective tracking of clinical academic careers and academic work force requirements provides a reliable data base on which to base rational planning (see 5.6 below), we recommend that about 50 clinician scientist NTNs are provided every year. This would allow each medical school to establish a HEFC-funded clinician scientist post each year (see 5.3.3) whilst at the same time supporting the 25 or so individuals obtaining clinician scientist fellowships from the MRC, Wellcome Trust and other sources each year. Since schemes will be generally five years in length but may exceptionally be up to seven or eight years (see 5.3.1) we anticipate that there would be around 300 clinician scientist NTNs held at any one time, a very small number when compared with the national stock of over 13,000.

5.3.3 'Tenure-track' status

We believe that the very best trainees deserve improved security when choosing a clinical academic career. We propose that medical schools should view the small cadre of clinician scientists as 'junior faculty' on 'tenure-track'; i.e. medical school heads/deans should be in a position to guarantee that subject to satisfactory progress the individual can be taken into a senior clinical academic post at the end of their clinician scientist scheme. In all but a few medical schools the numbers of clinician scientists in post will be so small that anticipated retirements and succession planning should allow such guarantees to be made. Indeed, medical schools may wish to establish a clinician scientist post each year in order to plan for replacement of key staff likely to retire five to seven years later. For example, anticipated departure of a school's professor of orthopaedic surgery could prompt a proleptic search by a medical school for the best young academic orthopaedic surgeon who would then be developed through the clinician scientist scheme. Enlightened medical schools may realise that in some disciplines clinician scientists may need to be 'lent' to other centres in order to gain the best research training (see 5.5.2).

'Tenure-track' may not be a realistic prospect in a few medical schools with outstanding records for attracting externally-funded clinician scientists but these individuals are already prepared to forgo security in order to benefit from the research opportunities on offer. However, these medical schools will need to consider the 'draw' of tenure-track posts on offer in other centres. Indeed, by enabling every medical school to establish one clinician scientist post per year, we hope that our scheme will promote the revival and growth of clinical academic medicine throughout the UK. This will complement externally-funded intermediate fellowships which have tended to be won by individuals training in elite centres, although the working party is aware of many such individuals who ultimately move to senior posts in other medical schools.

5.3.4 Relevance to academic general practice

If access to training fellowships is currently difficult in general practice, achievement of clinician scientist status will be harder still. The very real difficulties of meeting the requirements of principal status while pursuing research leadership threatens the very idea of a clinical academic in general practice, with the result that the important clinical research agenda prioritised by both the MRC and the NHS R&D programme is often not pursued. However, we believe that, with imagination, the proposed clinician scientist scheme could provide the protected personal funding necessary to combine post doctoral research training with clinical leadership as a principal in a manner that would prove attractive to practice partnerships, primary care groups and universities.

5.3.5 Funding and remuneration issues

Our proposed ‘start up’ of 50 clinician scientist posts per year could be achieved with little new funding. About 25 posts are already funded by MRC/research charities/NHS etc. We believe that the additional establishment of one clinician scientist post per year in each medical school (to reach a national total of around 50 each year) could be initiated by redeployment of existing HEFC-funded posts, but would be strengthened and sustained should new funds be made available. Since some postgraduate deaneries have helped universities protect clinical lectureships by funding a notional salary element for clinical training (usually 50%), we suggest that such strategies would be one approach by which to provide additional financial support for clinician scientist schemes.

Moreover, limited new funding will be required to ensure that some clinician scientists have ‘portable’ support, enabling them to move freely from institution to institution in order to benefit from the best training opportunities before returning to a senior post at their host medical school.

Remuneration for clinician scientists funded from external sources is currently based on the SpR/clinical lecturer scales, with consultant grade pay being provided once a CCST is

obtained and an honorary consultant contract offered (e.g. about half of current MRC clinician scientists have a CCST). Payment of additional duty hours (for out-of-hours clinical work) for those in the SpR/clinical lecturer grades varies from university to university. The likely duration of training may also pose problems (for example, there are only nine points on the SpR scale and yet a clinician scientist may need to be on SpR pay scales for 10 or more years).

We propose that serious consideration is given to employing clinician scientists on the widely applicable scale for ‘clinical senior lecturers without consultant contract’. Specialists would move over to the conventional clinical senior lecturer scale once a CCST is achieved. Equivalent criteria would need to be developed for academic general practitioners. Indeed, the attendant boost in pay and status upon entering the clinician scientist scheme may help those specialties in which there is the disincentive of the prospect of loss of parity with consultant colleagues able to undertake private practice. Externally funded posts may need ‘topping up’ by host universities, although we are pleased to note that research funders have been generally sympathetic.

Finally, we recognise that the award of honorary consultant contracts for clinician scientists achieving a CCST in a hospital specialty part way through their scheme might engender concerns for the relevant NHS trusts. We would reassure Trusts, however, that (a) these posts will be few in number; and (b) the individuals concerned are unlikely to develop new or expensive services in the relatively short period that they hold consultant status during a clinician scientist post.

5.3.6 Research expenses during the scheme

Clinician scientist posts funded by the MRC, Wellcome Trust and other research charities not only provide personal support for the holder, but also provide essential research expenses. These may include a support post to ensure that the work continues under the clinician scientist’s direction while s/he is undertaking intensive periods of clinical training/service.

However, such additional expenses could not be provided from university/postgraduate deanery funds employed to provide clinician scientist posts. It would be ideal if such clinician scientists could apply to research funding agencies for clinician scientist support grants, which would offer comparable support and which would be judged by the same criteria/panels as applications for fully funded clinician scientist posts. During consultation, the Director of the Wellcome Trust indicated that the Trust would consider, without obligation, proposals for the development of such a scheme (M Dexter, personal communication).

5.4 Clinical lectureships must be retained

We view the proposed clinician scientist grade as an attractive addition to the range of career opportunities available to academically-minded young doctors and a means by which to foster future leaders in clinical research. However, it must be emphasised that existing clinical lectureships recognised for honorary SpR training offer an important career opportunity and should be retained; wholesale conversion of clinical lectureships to clinician scientist posts is not our intention.

Furthermore, clinical lectureships have additional value for particular groups of trainees; for some trainees such posts offer the ideal opportunity to consolidate academic interests and develop a commitment to a research-led career. Others may wish to develop a major interest in teaching, which we value very highly. Finally, in some specialties there are currently very few individuals with the training track record necessary to compete successfully for clinician scientist positions so that clinical lectureships will serve as an important 'bridge', enabling trainees to develop their track record in research before seeking a (shortened) clinician scientist post.

However, clinical lectureships in hospital specialties are of little value to academic medicine if the job plan is essentially that of a specialist registrar. The working party has come across encouraging examples of close collaboration between universities and post graduate deaneries to construct SpR rotations

that ensure periods of protected academic time for clinical lecturers with honorary SpR status.

While we accept that reductions in NTN allocations must be managed on the basis of supporting those posts which offer the best training, we strongly believe that this process must not devalue an already shrinking stock of clinical lectureships by denying NTNs to post holders in 'blocked' specialties.

5.5 Proposals to address disincentives that affect particular groups of trainees

We believe that the clinician scientist scheme addresses the 'generic' problems of lack of career structure, insufficient flexibility in combining clinical and research training and prolonged insecurity. However, solutions are also needed to the additional disincentives that affect particular groups of trainees (4.2).

5.5.1 Dealing with pressure to commence research training at the end of general professional training: a research training access scheme

In hospital-based specialties the SpR grade should allow the flexibility for motivated young doctors to take 'time out' to undertake doctoral research training fellowships after one or two years of specialist training. Unfortunately, underfunding of projected consultant expansion has 'blocked' the SpR grade in several specialties. This has resulted in academically-minded doctors in the pre-SpR senior house officer (SHO) grade facing the potent disincentive of pressure to use research training as a passport to SpR training. As a result, upon completion of their research doctorate, they face around five years of SpR training during which interest and competitiveness in research must be maintained against all odds (4.2.1).

The working party considered various options, including automatic award of NTNs to doctors winning research training fellowships and 'ear marking' of a proportion of NTNs in each specialty for award to doctors undertaking such fellowships. It was felt that such solutions might be difficult to promote in the current climate of large reductions in the number of

NTNs in some specialties (e.g. paediatrics).

A practicable interim solution would be the annual provision of about **50 research training access posts** for outstanding SHOs. These would offer doctors qualified for SpR training in 'blocked' specialties up to two years' specialist training registrable against future requirements (i.e. comparable to existing NHS-funded locum appointments for training - LATs). The incorporation of up to 20% of time for preparation of research training fellowship applications under the sponsorship of an academic unit (which need not be in the chosen clinical specialty) would also address the additional disincentive of lack of research training environments in some disciplines (see 4.2.2 and 5.5.2). Funding could be made available through LAT opportunities arising from SpRs taking 'time out' for research, but redeployment of NHS salaries freed due to 'lost NTNs' would strengthen the scheme. Moreover, given the importance of research-active doctors (whether employed by the NHS or universities) to the R&D function of the NHS, we suggest that the NHS R&D programme may also wish to contribute funds.

5.5.2 Promoting research training in some disciplines: limited earmarking of fellowships, links with strong centres and academic access schemes

Earmarking research training fellowships: The problem of doctors in some disciplines winning few research training or career development fellowships has been alluded to above (3.5.2). Research funding bodies are already trying to alter the balance of distribution of fellowship awards so that doctors in specialties with less academic activity are encouraged to apply. Thus, the MRC has collaborated with the Royal Colleges of Surgeons and the Royal College of Obstetricians and Gynaecologists to co-fund and target prestigious MRC Clinical Training Fellowships to what have proved to be outstanding applicants from these fields. While these earmarked fellowships are few in number, they appear to have promoted interest and success in obtaining non-earmarked MRC research fellowships. In a 1998/9 MRC sample of 241 fellowship holders, the proportion of

intending surgeons had increased from 9% (in 1997/8) to 18% of the cohort and there was also a near doubling in the number of fellows aiming for obstetrics and gynaecology (from 3.6% to 7%). The number of applications from doctors in surgical disciplines and obstetrics and gynaecology also doubled. Furthermore, the MRC has also introduced clinician scientist fellowships dedicated to patient-oriented research and has identified increasing research in clinical neurology as a strategic aim (with the result that young neurologists held 11.4% of fellowships in the 1997/8 survey described above). Similarly, the Wellcome Trust has recently supported or still supports schemes to promote research training in psychiatry, medical microbiology, epidemiology, health services research, ophthalmology, anaesthesia and cardiovascular medicine, while the NHS R&D programme has had a major initiative in funding career development in primary care.

We applaud these beneficial effects of limited specialty earmarking of research training fellowships, since this strategy appears to deal with the self-fulfilling prophecy that doctors in some specialties 'need not bother to apply as they are never successful'. However, it would be counter-productive to engage in wholesale earmarking, especially for intermediate or senior fellowships.

Developing links with strong centres: We also suggest that disciplines lacking in research training environments should encourage their growth by 'lending' research trainees to strong centres before nurturing their further development in their discipline/medical school base. For example, a young anaesthetist interested in acute lung injury might benefit from a research fellowship in one of a number of internationally renowned respiratory research centres in the UK. We suggest that research funding agencies might collaborate with the proposed national clinical academic training co-ordination committee to offer a pro-active 'placement advice service' to promote such mobility.

Promoting access to research training: In hospital specialties, we have proposed above (5.5.1) that postgraduate deans and clinical

academic departments co-operate to provide a research training access scheme. However, it should also be emphasised that research funding agencies have been active in this area by introducing introductory schemes, such as one year entry level fellowships offered by the Wellcome Trust to trainees who have not gained relevant experience at medical school.

In general practice, an increasing number of academic access schemes are available to enable part-time MSc degrees and research projects to be integrated with part-time principalships, or within extended academic registrar schemes funded by NHS R&D or by postgraduate deans. Developing this start in research is, however, still very difficult and rather ad hoc. For example, university departments are increasingly offering short term appointments as fellows or clinical lecturers on 'soft' money to provide the necessary springboard for a successful training fellowship application. We view the encouragement of potential academic leaders in general practice to compete for national training fellowships as essential for the development of the discipline and would encourage post graduate deans, directors of NHS R&D and universities to consider more systematic approaches to ensuring access. Indeed, the research training access scheme proposed above (5.5.1) could be adapted to provide an attractive route into academic medicine for trainee general practitioners nearing the end of vocational training.

5.5.3 Addressing problems with remuneration in some disciplines

We strongly support pay parity with NHS colleagues as an essential principle but recognises the problem of availability of private practice in some disciplines. Addressing this problem is outwith our remit, since the issue largely concerns parity once consultant or principal status is achieved. However, our proposal that appointees to clinician scientist posts should be remunerated on the scale for 'clinical senior lecturers without honorary consultant contract' offers the prospect of an important boost in income and status for

outstanding young clinical academics in their early thirties (5.2.5).

To increase the attraction of senior training posts in academic general practice, urgent attention must be given to the dual disincentives of inaccessibility of principal status and debarment from consideration for distinction awards. Consideration of honorary principalships or honorary consultant positions for academic general practitioners would help, but attention to the clinical and academic terms and conditions of academic general practice is also needed.

5.5.4 Enhancing flexibility in some disciplines and for particular trainees

Disciplines requiring persistent patient contact: Increased flexibility, especially in the clinician scientist phase, would be a strong incentive towards recruitment since trainees will appreciate that special measures are being taken to maximise their chances of achieving the twin goals of research competitiveness and clinical competence. The flexibility to mix training in research and clinical medicine on an *ad personam* basis will be particularly important in disciplines where maintained patient contact is perceived as crucial for acquisition of competence, such as surgery, obstetrics and gynaecology and general practice. The privilege of such flexibility, which would require clinical training close to the academic base, would be earned by successful competition for clinician scientist posts. However, we have also emphasised (see 3.3.1 and 5.4) the important opportunity to consolidate research and clinical experience offered by clinical lectureships in these disciplines.

Trainees with domestic commitments: Flexible work patterns also allow doctors (mainly women) to continue training during periods of heavy domestic commitments; many later change back to full time working. The established mechanisms for flexible clinical and research training are compatible with the clinical academic career pathways proposed here. However, the following general proposals would all help to improve the present situation:

- (a) Flexible NHS clinical training should be

available to all those who want it, through increased funding of posts and greater publicity for the schemes;

- (b) The availability of flexible and career re-entry research fellowships should be more widely publicised;
- (c) Since family commitments are the main challenge, returning to work after maternity leave, whether full time or flexibly, should be encouraged and facilitated. If necessary, grants should be extendable;
- (d) Proportionately greater research support costs, for example for extra technical support, would assist those in part time research training;
- (e) Domestic commitments should be accepted and taken into account in job plans; practical help could include on-site child-care and fewer out-of-hours meetings;
- (f) Competency based assessment is preferable to a time served approach, since clinicians in, for example, half-time posts do not usually take twice as long to acquire the necessary knowledge and expertise;
- (g) Flexible training should not be regarded as an inferior option. But for this to be accepted the culture and attitudes of the medical workplace will need to change. It should be noted that these changes would benefit career as well as training posts.

Changing clinical activity after entry to the specialist register: We recommend a solution which may alleviate current inflexibility in the ability of doctors to extend or change their area of clinical activity after entry to the specialist register. The Specialist Training Authority of the Royal Colleges should devise a mechanism which provides additional accreditation to reflect new skills acquired by the consultant. This would have the benefit that academic trainees, whether they have entered the specialist register by obtaining a conventional CCST or through the restricted academic and research route, would have the reassurance of knowing that should they wish to change career path and extend their clinical practice at a later date, a means existed to achieve this. Implementation of this recommendation requires flexibility of two sorts. The first would be to allow *ad personam* schemes to be developed for extension of clinical training for consultants. The second is the development of a sound bureaucratic process to

assess and accredit those who have participated in such higher training. The implementation of such a scheme may have beneficial effects outside academic medicine in allowing more flexible career development for consultant staff in a rapidly changing NHS.

5.6 The need for improved clinical academic career track data

We strongly support current efforts to improve data on the clinical academic workforce through implementation of comprehensive databases, such as those being developed by the MRC, the Wellcome Trust and the Department of Health (through AGMETS, the Department of Health's Advisory Group on Medical Education, Training and Staffing). *However, we stress that remedial action to improve recruitment into academic medicine must not be delayed until such databases are in place and well validated.*

We recommend that in order to provide the information needed to address the clinical academic recruitment problem rationally (and more generally to aid workforce planning both in medical schools and the NHS), the databases created should enable interested parties to abstract

- (a) For established clinical academic posts:
Data on all such posts including the name of the postholder; the NTN or specialist registration held; the intended date of contract review or retirement and the source of funds. If vacant this should be flagged.
- (b) For training posts:
Data on all doctors currently in research training or career development posts; the posts held before the period in research; the intended date of completion of the research period whether an NTN is held; and the intended specialty and the source of funds.

As a cross reference it would be desirable to have:
- (c) For individual specialties
Data on each specialty, to detail the names of all those in career posts, holding a CCST or an NTN (whether conventional or clinician scientist); those currently in research training and their planned date of return to clinical

practice or training, and the source of their salary.

While we are primarily concerned with academic posts nevertheless we believe it is highly desirable that the following data [9] should also be collected and collated.

- (d) Data on all registered medical practitioners in the UK, regularly updated to show their current and most recent post held, and their expected or planned date of retirement;

- (e) Data on all medical posts held in the NHS, regularly updated to detail either a vacancy or the name and previous posts of the individual holding the post.

While we do not underestimate the size of this task, especially the regular updating, we believe that its importance is now widely accepted, and that if the input of all interested parties can be co-ordinated centrally the objectives set out above could be achieved.

6. Conclusions and points for action

Recruitment to clinical academic medicine is at a crossroads. Not only is there persistent difficulty in recruiting clinical professors but there is also worrying evidence that pressures including the research assessment exercise have led to a reduction in the stock of clinical lectureships, the traditional seedcorn of clinical academic medicine. Although recently qualified doctors in many disciplines still show strong interest in obtaining research training fellowships funded by the MRC, NHS, Wellcome Trust and other charities, doctors in some disciplines win few fellowships, there is a shortage of opportunities for protected postdoctoral research, and strong disincentives operating after the first research fellowship have been exacerbated recently by the strategies employed to implement the specialist registrar grade for higher training in hospital specialties.

Three key disincentives against an academic career operate in all hospital specialties and in general practice:

- (i) *A clear career structure is lacking* in clinical academic medicine relative to a career in the NHS;
- (ii) *insufficient flexibility* for combination of postdoctoral research training and clinical training is offered by current opportunities in the SpR and clinical lecturer grades; and
- (iii) *prolonged insecurity* results from the need for clinical academics to undertake about five years of doctoral and postdoctoral research training and, in the case of specialists, around five years of SpR training before a secure senior post is obtained.

To address these disincentives we propose the introduction of a **clinician scientist scheme** through which to nurture a cadre of research-led doctors in all disciplines by offering a clear, flexible and secure training option for doctors who demonstrate outstanding potential for research during a first, doctoral period of research training. This scheme, which would be additional to existing SpR and clinical lecturer posts, could be funded by matching current external research agency investment through redeployment of budgets currently held by universities and postgraduate deaneries. The scheme has three key features requiring support from a number of bodies:

- (a) Co-ordination and prospective planning of academic and clinical training needs, on a flexible *ad personam* basis, through a national clinical academic training co-ordination committee, which will need to be established by the royal colleges on behalf of the Specialist Training Authority, and which will need to liaise closely with postgraduate deans;
- (b) establishment by the Department of Health of national training numbers dedicated to clinician scientists, the award of which would be determined by the national clinical academic training co-ordination committee, and which would allow postgraduate deans to construct flexible programmes supernumerary to existing SpR rotations; and
- (c) development by medical schools (with support from the Higher Education Funding Council and research funding agencies) of means to offer clinician scientists 'tenure track' status while promoting opportunities to benefit from research training in more than one centre.

Although we acknowledge the need for much improved data on clinical academic career paths, **we recommend the immediate introduction of 50 clinician scientist NTN per year in order to lead the process of change.** This will require close co-operation between the royal colleges, postgraduate deans and the universities, with the continued support of research funding agencies and the relevant government departments. However, we emphasise that wherever possible, existing clinical lectureships offering honorary SpR status and protected academic time should be retained, as they offer an additional career path.

We have also identified additional disincentives that affect some trainees more than others:

- (iv) *pressure to seek research training upon completion of general professional training* because of difficulties in some specialties in entering a 'blocked' SpR grade,
- (v) *limited research training opportunities or environments in some disciplines*, and
- (vi) *problems in providing flexibility in particular disciplines and/or for particular trainees*, especially those with domestic commitments.

To address (iv) and (v) we propose a **research training access scheme** for further consideration. Managed by lead postgraduate deans in consultation with the national clinical academic training co-ordination committee, this scheme would offer about 50 outstanding SHOs per year up to two years of LAT training combined with protected time hosted by a strong research group for development of applications for research training fellowships. The scheme would require new funding, possibly from the NHS R&D programme, or deriving from monies liberated to postgraduate deans from reductions in NTN allocations. The problem of limited research training opportunities in some disciplines can also be addressed by judicious **'earmarking' of research fellowships** by research funding agencies and, to promote mobility and exploitation of research training opportunities in strong disciplines, the development of a **'placement advice service'** in collaboration with the proposed national clinical academic training co-ordination committee.

Furthermore, new mechanisms must be devised to allow consultants to change clinical activity after entry to the specialist register. Finally, we have proposed a number of general measures to enhance flexibility, particularly for doctors with domestic commitments.

To conclude, we believe that clinical academic medicine can be made a more attractive career choice through joint action involving the royal colleges, postgraduate deans, the Department of Health, research funding agencies and the universities/medical schools (supported by the Higher Education Funding Council and the Department for Education and Employment). Although such co-operation might seem complex, great benefit could be obtained from relatively simple changes in the clarity, flexibility and security of training programmes, centred on introduction of a 'tenure track' clinician scientist scheme. ■

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8. Appendices

Appendix I

Membership of the Academy of Medical Sciences working party

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Professor Jonathon Shepherd
Professor Philip Steer
Professor Gordon Stirrat
Professor Steve Tomlinson
Professor Dafydd Walters
Professor Sir David Weatherall
Professor Martin Whittle
Professor Gordon Wilcock
Professor Brian Williams

Appendix II

Evidence from external sources

Formal discussions have been held with:

The Academic and Research Sub-Group of the Advisory Group on Medical Education, Training and Staffing (Chairman: Prof John Temple)
The Academy of Medical Royal Colleges (Chairman: Prof Roddy MacSween)
The Chief Executive of the Medical Research Council (Prof George Radda)
The Chief Medical Officer (Prof Liam Donaldson)
The Chief Medical Officer for Scotland (Sir David Carter)
The Council of Heads of Medical Schools (Chairman: Prof Christopher Edwards)
The Director of NHS R&D (Prof Sir John Pattison)
The Director of the Wellcome Trust (Dr Michael Dexter)