



Building clinical academic capacity and the
allocation of resources across academic specialties

The Academy of Medical Sciences

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Foreword

The benefits of clinical and biomedical research, in delivering innovations in healthcare that improve national health and generate wealth, are widely recognised. Government and funders are currently investing in UK clinical research by supporting schemes to enhance the required infrastructure, funding and manpower. A challenge for funders and institutions is to allocate resources across the range of clinical academic specialties, so as to most effectively pursue research and its translation into improved healthcare.

The Academy of Medical Sciences was pleased to be asked to advise on these issues, by formulating guidance on how funding and resource should best be used to support clinical academic specialties and strengthen clinical academic manpower.

The Academy's mission is to foster the best medical research in the UK, and to translate this into improved outcomes for patients. This work is underpinned by the Academy's nine hundred strong Fellowship, including representation across all the clinical specialties, the NHS, academic institutions, industry and public service. This Fellowship places the Academy in a unique position to take a broad UK-wide overview of the challenges and opportunities facing medical research and capacity development.

The Academy's Clinical Academic Careers Committee undertook this piece of work. The committee works to fulfill the strategic goal of maintaining a first class academic workforce, through the support, development and promotion of careers for medical scientists and the encouragement of good practice in their training and development.

I am grateful to the committee (whose membership is enclosed) for all their input, and for working to ensure the perspectives of all academic specialties and UK regions were considered. Many committee members are active on a number of funding bodies and panels: the committee felt there would be merit in presenting its recommendations as a set of guiding principles for funders to use when allocating fellowships and programmatic funding across the clinical academic specialties.

It is important to emphasise that this paper and its recommended guidelines are one contribution to a UK-wide debate on strategies for resource allocation across clinical academic specialties. However, given the changing landscape of postgraduate medical education and clinical research, and the important funding decisions which are currently being made, we consider it a particularly appropriate time to share our conclusions and recommendations.



Professor Patrick Sissons FMedSci
Chairman, Clinical Academic Careers Committee

Summary

Building clinical academic capacity and guidelines for the allocation of resources

UK clinical research is currently benefiting from significant additional investment from Government and research funders. This commitment to strengthen clinical research capacity provides the UK with an exceptional opportunity to enable research innovations to meet current and future healthcare needs. Key to delivering this translational research agenda is the capacity and composition of the UK's clinical academic workforce, ensuring the correct balance of recruitment across clinical academic specialties; to provide the most effective support for critical research areas and the translation of new findings into practice.

The Academy was approached to provide guidance on how funders might best support and build capacity across clinical academic specialties. The Academy's Clinical Academic Careers Committee undertook this work, focussing on how to provide optimal support through programmatic and fellowship funding. Discussions within the committee have resulted in this position paper which sets out the Academy's view of the factors that should be taken into account when allocating resources across clinical academic specialties. The concluding recommendations, aimed at facilitating a more coordinated approach to building clinical academic research and workforce capacity, are presented as guidelines to assist funding bodies and Higher Education Institutes (HEIs) when allocating programmatic research funding and fellowships.

The paper, with its recommended guidelines, should serve as the basis for a wider UK debate on the strategies necessary to meet current and future clinical research capacity needs. We welcome feedback from both organisations and individuals.

Important principles underlying the recommended guidelines are:

- NHS/Higher Education Institute (HEI) partnerships should be motivated with incentives to promote clinical research capacity and generate a research-aware clinical workforce.
- Cross-fertilisation of traditional clinical academic disciplines from a wider range of relevant basic and clinical research areas should be encouraged.
- A first class workforce should be sustained throughout the NHS by valuing academic endeavour, ensuring flexibility and providing long-term career pathways.
- Funding and resource should be allocated strategically at both the national and local level, prioritising flexibility and accounting for the differing needs of individual institutions.
- Capacity building of clinical academic specialties should be debated and coordinated in a UK-wide forum, given the differing approaches to academic workforce planning in the devolved administrations.

These principles are expanded upon in chapter 5 on page 20, and should be read in conjunction with the guidelines for funders in allocating fellowships and funds to academic specialties.

Guidelines for funders and higher education institutes in allocating fellowships and funds to academic specialties

Funders, and institutions holding devolved budgets from funders, face the difficult task of prioritising the allocation of fellowships and resource across clinical academic specialties. To assist this task the Academy offers some broad principles to be used in deciding how such funding should be awarded. We recommend that funding decisions on allocation of fellowships and programmes should consider:

The clinical academic specialty

The case for investing in capacity building in a specialty should take into account:

- The overall 'direction of travel' of a specialty.
- Future predicted healthcare needs and the prevalence of diseases the specialty serves.
- The therapeutic challenges raised by these diseases and healthcare needs.
- The technical developments likely to impact on the specialty – both leading to new diagnostic and therapeutic interventions, or rendering existing practice obsolete.
- The research skills needed to understand aetiology and hence prevention, and develop, deliver and assess new interventions – including the need for interdisciplinarity to acquire these skills and prosecute future research.
- Evidence that clinical academic training is valued and supported within the specialty at the national level by the appropriate colleges and specialist training committees and societies.

The training and research environment

The institution should demonstrate:

- A sound academic record (including research inputs/outputs and training record) within the given specialty or research area, coupled with a thriving research environment. New institutions, small institutions and institutions with niche expertise, should be provided with opportunities to develop in areas that allow them to make important contributions to research capacity.
- Opportunities for interdisciplinary working, where pertinent to the future needs of a specialty or research area.
- Evidence of technological breadth with access to underpinning technology platforms.
- Visible academic leadership.
- Evidence of effective career development of junior academics.
- Evidence of robust partnerships with the NHS, Deanery and other relevant research centres.
- A commitment to provide and recognise high quality teaching.
- For senior posts and fellowships that mark an individual's step to independence, evidence of plans to ensure sustainability of the post and the area of teaching/training and research the post subtends, not just in terms of funding for the post, but for the overall clinical research environment in the institution (infrastructure, number of other academic and NHS consultant posts etc.).

The training programme or scheme should demonstrate:

- Visible local leadership within the specialty or research area.
- A flexible and sympathetic approach to academic training by those responsible for the specialty at local (Deanery and regional specialty committee) and national (College and Speciality Training Committee) level.
- A flexible approach to the provision of clinical training and a willingness to consider different approaches for academic trainees, such as provision of clinical training within the academic centre, rather than a district hospital and flexible approaches to integrating clinical and academic training (e.g. blocks of weeks or months on and off clinical service).¹
- A robust training opportunity with access to national and local collaborations and exposure to interdisciplinary research.
- A commitment to provide adequate protected time for research.
- An appropriate supervisory framework with a clear commitment from both clinical and academic supervisors to making programmes work.
- Provision of local or regional mentorship programmes, with robust mechanisms to conduct joint clinical and academic in-training assessments and appraisals.

The potential of the candidate

The criteria to assess candidates will vary according to career grade. There is a distinction between pre-doctoral trainees and those making the step to academic independence via schemes such as Clinician Scientist Fellowships, Clinical Lectureships and Higher Education Funding Council for England/Department of Health (HEFCE/DH) Senior Lectureship awards etc. Candidates for these post-doctoral fellowships, should demonstrate:

- Evidence of high quality research training that has the potential to address the clinical research questions facing the specialty in the future.
- Clear, realistic and high quality proposals for their future research.
- A commitment to bring on the next generation of clinical academics through research training, supervision and mentorship, at the local or regional level.
- The potential for academic leadership.

¹ PMETB have developed a Quality Framework, which includes standards on educational quality management (Autumn 2007).
<http://www.pmetb.org.uk/index.php?id=qf>

Aims of the paper

This paper sets out the Academy's position on:

- Mechanisms for concurrently promoting and developing medical workforce and research capacity.
- Guiding principles for funders to use when allocating fellowships and funding programmes to build capacity in clinical academic specialties (presented in chapter 5).

It discusses these issues in the context of the current challenges and opportunities facing clinical academic medicine. The paper is intended to form a basis for, and to stimulate, further discussion amongst the key constituents on the strategies necessary to meet current and future clinical research capacity needs.

Background

The Academy was approached by Professor Sir John Tooke FMedSci, Chairman of the Higher Education Funding Council for England/ Department of Health (HEFCE/DH) committee awarding new Senior Clinical Lectureships, and Professor Dame Sally Davies FMedSci, Director General of Research and Development, Department of Health, to provide guidance on how funders might best support and build capacity across the clinical academic specialties through optimal allocation of both training and senior fellowships, and programmatic funding.

This request reflects concerns that:

1. Current approaches being taken to prioritise so-called 'academically vulnerable' specialties in the funding schemes designed to reinvigorate the Clinical Academic Career Path, might risk replicating the past by simply targeting resources to restore clinical academic staff numbers in traditional disciplines where

they have declined, without prior strategic consideration of the reasons for the decline.

2. There is a related need to decide whether there are emergent specialties or areas of clinical practice where greater clinical academic input will be needed if the UK is to contribute competitively at a global level.

This paper sets out the Academy's view of the factors that should be taken into account in allocating resources to build academic capacity across specialties most effectively. It does not seek to provide a detailed analysis of the relative academic vigour or numerical academic workforce needs in particular specialties, or of research priorities, but offers some broad principles for funders to utilise when allocating fellowships and funding programmes across academic specialties. It is intended to form a basis for further discussion amongst the key constituents and to stimulate further exploration of the strategies necessary to meet current and future clinical research capacity needs.

The Academy's nine hundred strong Fellowship includes representation across all the clinical specialties, the NHS, academic institutions, industry and public service, placing it in a unique position to take a broad overview of the challenges facing medical research and capacity development, and to offer possible solutions. One of the Academy's five strategic goals concerns the maintenance of a first class academic workforce, through the support, development and promotion of careers for medical scientists and encouragement of good practice in training and development. The Academy's ultimate mission is to foster the best medical research in the UK, and to translate this into improved outcomes for patients.

Introduction

Clinical and medical research leads to innovations in healthcare that improve national health, and are also international commodities and significant wealth generators for the UK.^{2,3} Continued investment in this sector, and valuing excellence, are fundamental to securing the UK's position as a global leader in medical research and healthcare.

Mainstream clinical medicine draws on discoveries, innovations and developments pioneered and implemented by clinical academic staff. In order for the NHS to thrive, it requires a clinical workforce and leadership trained to utilise research and innovation for patient benefit: academic values and the spirit of enquiry should thus be pervasive throughout the service.

Despite wide acknowledgment of the importance of clinical academic medicine, there has been increasing concern over the decline in numbers of UK clinical academics and the significant loss of research capacity in some specialties.^{4,5,6,7} Between 2000 to 2006 the number of UK clinical academics declined steadily from just over 3500 to less than 3000 full time equivalents (FTE).⁸ Over the same period the NHS consultant workforce across the board has expanded significantly. In response, a number of initiatives have been developed with the aim of revitalising the clinical academic workforce and bolstering the UK's clinical research infrastructure. These initiatives may

be starting to make an impact; in 2007 the first increase in clinical academic numbers was reported (a 2% increase compared to 2006).⁹

Schemes to revitalise the clinical academic workforce

A number of funders have invested resources in schemes intended to build clinical academic capacity. Such schemes include:

1. The National Institute of Health Research (NIHR) Integrated Academic Training Pathway (IATP) scheme, providing Academic Clinical Fellowships (ACFs) and Clinical Lectureships (CLs).
2. Clinician Scientist Fellowships provided by the Medical Research Council (MRC), research charities and DH.
3. The New Blood Clinical Senior Lectureships created by the DH and HEFCE. NHS Education Scotland has an initiative to consolidate funding of lectureships in the absence of 'IATP-like' schemes.

These schemes are complemented by new and pre-existing junior, intermediate and senior clinical research fellowship programmes provided by many funders. They have created new pathways for postgraduate medical trainees wishing to develop a career in clinical academic medicine.^{10,11}

2 Bioscience and Innovation Growth Team (2003). *Bioscience 2015: improving national health, increasing national wealth*. <http://www.bioindustry.org/bigreport/>

3 The Wellcome Trust, Medical Research Council and The Academy of Medical Sciences (2008). *Medical research: what's it worth?* <http://www.acmedsci.ac.uk/p99puid137.html>

4 Academy of Medical Sciences (2002). *Clinical academic medicine in jeopardy: recommendations for change*. <http://www.acmedsci.ac.uk/p99puid25.html>

5 Academy of Medical Sciences (2000). *The tenure-track clinician scientist: a new career pathway to promote recruitment* (Savill Report). <http://www.acmedsci.ac.uk/p99puid29.html>

6 Academy of Medical Sciences (2003). *Strengthening clinical research*. <http://www.acmedsci.ac.uk/p48prid18.html>

7 Medical Schools Council (2000 - 2007). *Clinical academic staffing surveys*. <http://www.chms.ac.uk/publications.htm>

8 Medical Schools Council (2007). *Clinical academic staffing survey*. <http://www.chms.ac.uk/publications.htm>

9 Medical Schools Council (2008). *Clinical academic staffing levels in UK medical schools*. <http://www.chms.ac.uk/publications.htm>

10 Report of the Academic Careers Sub-Committee of Modernising Medical Careers and the UK Clinical Research Collaboration (2005). *Medically-and dentally-qualified academic staff: recommendations for training the researchers and educators of the future*. http://www.nccrcd.nhs.uk/intetacatrain/index.html/copy_of_Medically_and_Dentally-qualified_Academic_Staff_Report.pdf

11 Clinical Senior Lectureship Awards. <http://www.hefce.ac.uk/research/cslaward/>

Strengthening the UK's clinical research infrastructure

Coupled with these strategies to increase manpower there has been a renewed commitment to bolster the UK's clinical research infrastructure and funding opportunities. The NHS R&D strategy for England, 'Best research for best health', aims to revitalise health research within the NHS and has led to the establishment of the National Institute of Health Research (NIHR), 12 NIHR Biomedical Research Centres (five Comprehensive and seven Specialist) around England, as well as numerous programmes and funding streams to support and develop NHS based biomedical and public health initiatives.¹² The recent 'NHS next stage review' supports the creation of formal NHS and university partnerships whereby the institutions take an integrated approach and focus on world-class research, teaching and patient care, through designation of a number of 'Academic Health Science Centres' (AHSCs).¹³ The Devolved Administrations (DAs) continue to develop their own schemes.

Government funding for the health sciences is now overseen by a new overarching body, the Office for Strategic Coordination of Health Research (OSCHR), which holds responsibility for the combined MRC and NIHR budget (which will reach £1.7bn per annum by 2010). OSCHR, through liaison with the MRC and NIHR, is working to develop and implement the changes proposed by the Review of Health Research Funding.¹⁴ The UK Clinical Research Collaboration (UKCRC) has played an additional role in coordinating

investment of major research funders – NIHR, the Research Councils, Wellcome Trust, Cancer Research UK (CRUK), British Heart Foundation, other medical research charities and the representatives of relevant UK commercial interests (Association of British Pharmaceutical Industry and BioIndustry Association etc.).¹⁵ UKCRC's members have made recent valuable capital investment in Clinical Research Facilities and Public Health Centres of Excellence.

Instilling a spirit of enquiry throughout the NHS

A major achievement of the NIHR has been to promote innovative partnerships between the NHS and research institutions through a number of schemes and programmes. This approach is helping to reassert academic endeavour as a vital role of clinicians and promote a better understanding of the contributions clinical academics make to the NHS. Furthermore, this strategy has been reinforced in the recent 'Aspiring to excellence' report chaired by Professor Sir John Tooke FMedSci. The report emphasises the importance of academic values, and of embedding research within mainstream medical training.¹⁶ In its response to the report, the Academy fully supports the principal recommendations of 'Aspiring to excellence', and its emphasis on engaging the academic sector in mainstream training. The British Medical Association's recent report on 'Academic medicine in the NHS: driving innovation and improving healthcare' also highlights the importance of academic medicine in the teaching and training of doctors.¹⁷

12 Research and Development Directorate, Department of Health (2006). *Best research for best health. A new National health research strategy.*

http://www.dh.gov.uk/en/Researchanddevelopment/Researchanddevelopmentstrategy/DH_4127109

13 Darzi A (2008). *High quality care for all, NHS next stage review final report (Department of Health).*

http://www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/DH_085825

14 Cooksey D (2006). *A review of UK health research funding.* HMSO, London.

15 <http://www.ukcrc.org/>

16 Independent Report of the Independent Inquiry into Modernising Medical Careers (2008). *Aspiring to excellence.*

http://www.mmcinquiry.org.uk/Final_8_Jan_08 MMC_all.pdf

17 British Medical Association (2008). *Academic medicine in the NHS: driving innovation and improving healthcare.*

<http://www.bma.org.uk/>

Whilst there is evidence that a number of NHS Trusts recognise the importance of supporting clinical academic medicine through creating robust University partnerships and offering financial underpinning, there appears to be much variation across the country.

Greater appreciation of the role of NHS Trusts in investing in and supporting academic medicine is essential to retaining the ability to capacity build across the NHS. The benefits of supporting clinical academic medicine and research infrastructure, in terms of improved quality of service delivery, and ability to attract a first class workforce and external funding, require emphasis. It is encouraging to see current interest, and support from the recent 'NHS next stage review', in creating new models for formally integrating the delivery of clinical services, teaching and research through AHSCs and Health Innovation and Education Clusters (HIECs).¹⁸ It will be important that these partnerships play to UK strengths, and that local institutions are able to interpret flexibly the partnership and develop innovative models, with governance that is suited to the local context. The models which emerge should provide a template for other emerging regional partnerships. The full engagement of the relevant Royal Colleges, particularly those representing academically threatened specialties, is also essential to capacity building in academic medicine.

Securing the UK's future clinical academic capacity

These new schemes and the underpinning financial support for clinical academic posts create an opportunity for the UK to secure its clinical academic capacity, and thus sustain its international competitiveness in clinical research and innovative patient care.

In order to realise this opportunity fully it will be necessary to:

- Define priorities for future clinical research and decide which clinical specialties will be required to translate new findings into practice.
- Organise research infrastructure and resources to support academic development in appropriate key specialties.
- Devise mechanisms for effective allocation of funds to implement these measures.
- Attract and sustain a first class academic workforce of appropriate capacity.

These points are expanded on in sections one to four, and lead to a set of guiding principles and recommended guidelines.

¹⁸ Darzi A (2008). *High quality care for all, NHS next stage review final report* (Department of Health). http://www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/DH_085825

1. Priorities for research relating to clinical academic specialties

Status of clinical academic specialties

There is great variation across clinical specialties in terms of their perceived 'academic viability'. Whilst some (for example medical specialties such as endocrinology) appear to be attracting reasonable numbers of academic trainees, over recent years others have been labelled as vulnerable or shortage specialties on the grounds of decreasing academic recruitment and unfilled academic posts.^{19,20,21,22} Such vulnerable academic specialties include anaesthetics, obstetrics and gynaecology, paediatrics and child health, pathology, radiology, surgery and psychiatry.

Indeed most academic specialties outside internal medicine appear to have experienced some decline. It is thus likely that generic factors have affected all specialties, but the medical specialties, where there is historically a stronger academic base, have been able to withstand these influences better than other specialties. Addressing these generic issues is a necessary prerequisite to capacity building across all academic specialties.

Factors which are perceived as generic in deterring trainees from entering academic medicine include:

- A lack of visible academic leadership and role models at all levels – leading to possible lack of awareness of new opportunities in academic training.
- The introduction of run through clinical training schemes, sometimes associated with encouragement to complete training in the shortest possible time-frame (particularly in shortage specialties).
- Financial disincentives, including banding issues for individuals taking up externally funded fellowships that result in salary falls.
- The consequent extension in length of postgraduate training leading to a delay in both financial and career progression.
- Lack of a longer-term career pathway, job security or a future vision in some academic specialties (attributable in some cases to uncertainty around continued NHS funding for senior academic posts).
- Uncertainty about NHS career prospects in smaller specialties, and the lack of other positive options, in the event of not being able to obtain an academic post.
- The pressures of specific clinical training requirements, for example to acquire interventional and operative skills in the so-called 'craft' specialties, and the difficulties of integrating these requirements with research training.
- Issues relating specifically to women, including a lack of consistency in maternity rights and pay when transferring between clinical and academic contracts, differences in maternity pay policies amongst medical research funders and insufficient flexibility in working arrangements.

In addition, healthcare and health needs are changing and the pattern of resource required across the traditional specialties, and their clinical academic component, may accordingly vary. There may be multiple, and complex, reasons why a particular specialty may be in academic decline, and the determinants of vulnerability or success for individual academic specialties are often anecdotal and incompletely defined.

Prioritising academic specialties for investment

The challenge is to determine the range of academic specialties that will be crucial for meeting future healthcare research and

19 Academy of Medical Sciences (2003). *Strengthening clinical research*. <http://www.acmedsci.ac.uk/p48prid18.html>

20 Medical Schools Council (2000 - 2007). *Clinical academic staffing surveys*. <http://www.chms.ac.uk/publications.htm>

21 Medical Schools Council (2007). *Clinical academic staffing survey*. <http://www.chms.ac.uk/publications.htm>

22 Medical Schools Council (2008). *Clinical academic staffing levels in UK medical schools*. <http://www.chms.ac.uk/publications.htm>

teaching needs, and then to find mechanisms to promote and sustain resource and excellence in these areas.

At the local level, many UK institutions are already making strategic decisions about which academic specialties to selectively invest in, and those from which to withdraw – decisions sometimes made in response to possibly perverse incentives such as the Research Assessment Exercise. This trend is likely to continue, and it is unlikely that every medical school/institution will be able to support the full range of academic specialties. However it is important they retain the flexibility and capacity to create and support academic posts in response to new opportunities, in areas of emerging importance or where talented individuals emerge.

Focusing local research strength may be a logical progression for some institutions and may enable smaller research centres to develop areas of research excellence and training. However, a longer-term coordinated and managed approach will be required to ensure that the necessary spectrum of excellence in clinical research is maintained within each region of the UK, and that students and trainees have appropriate access to first class teaching and training across the specialties. Given that NIHR, MRC and other funders make decisions on placement of research infrastructure support affecting particular specialties, it appears sensible to coordinate research training resource with this investment. Indeed, OSCHR has begun this process through its 'Human Capital' planning process.

Will there be a need for new and different academic clinical specialties?

The changing demography of patients and disease, coupled with the pace of technical innovation in medicine, raises the issue of whether existing medical specialties will change or be replaced by new ones, or whether other healthcare professionals will deliver certain aspects of specialties hitherto the exclusive preserve of medical graduates – all with potential implications for research and teaching in relevant specialties. However it can be argued that such change has always been a continuous and reactive feature of medicine, in a process of continual specialty evolution – and indeed is often led by clinical academic specialists in a discipline.

In looking to future academic medical manpower needs, it is thus important to assess the 'direction of travel' of a specialty. This must take account of the future prevalence of the healthcare needs and diseases the specialty subtends, and the therapeutic and technical interventions that are likely to impact on those needs and diseases – and, crucially, the research skills that will thus be needed to develop, deliver and assess such interventions.

This approach is more logical than attempting to forecast precise numerical academic medical workforce needs, but its application to individual specialties requires work beyond the scope of this paper. However, as an example, rising longevity with a consequent increasing prevalence in cancers and degenerative diseases will require more specialists with skills in the diagnosis and treatment of these conditions – with knowledge of the relevant clinical and molecular phenotypic and genotypic diagnostic methods, and the ability to use the consequent detailed patient-specific information in designing and trialling new therapeutic interventions.²³

2. Organising research infrastructure and resources to support academic development in key specialties

Innovative ways of re-invigorating and re-populating academic specialties need to be identified and developed. Consequent on the recommendations in the 'Next stage review', two new bodies are currently being created in England: NHS Medical Education England (NHS MEE) and the Centre of Excellence for Strategic Workforce Planning, both sharing the task of workforce planning amongst their functions.^{24,25} The output from these two new bodies, and the resulting climate of postgraduate medical education, will be key to sustaining the clinical academic workforce. The Academy highlighted the important relevant issues in its response to the recent King's Fund's independent consultation on proposals for a Centre of Excellence for Workforce Strategy and Planning.²⁶

The Academy puts forward the further following strategies as suggestions for debate.

1. Fostering centres of excellence

There are now some 30 medical schools in the UK and, if some are not to become at risk of moving to teaching only institutions, it is essential that all institutions have opportunities to develop their research potential and fulfill their requirement to deliver the training curriculum. There is widespread acceptance that medical education should take place within a research active environment and furthermore, it is vital that academic and research capacity is maintained and strengthened throughout the NHS. However, there is a strategic case for enabling selected institutions to develop centres of excellence in specific academic specialties. Focusing resource in this way may serve the UK well by creating critical mass, which is more likely

to be sustainable, cost efficient and globally competitive in the longer-term.

This approach should not deter new or established institutions wishing to invest in and develop new research areas. Emerging centres should be identified and nurtured to develop their full potential in terms of excellence in research, teaching and training.

Within established and fully supported 'centres of excellence', an on-going challenge must be to maintain the highest research standards; an element of national competition should be retained to ensure quality is sustained so that the UK remains internationally competitive. Funders of these centres should thus work in a more coordinated way to allocate resource effectively and formally review research development and progress.

To maintain local or regional excellence, a partnership approach between the institution, NHS, local Deanery, NIHR or DA Health Department R&D, MRC and major research charities must be developed, with appropriate links to the Academy of Medical Royal Colleges. In England, the creation of a number of NIHR Biomedical Research Centres and Units, and the allocation of ACF and CL posts to such Centres in round three of the IATP competition is in line with this approach.

2. The training environment

A thriving research and training environment is vital to attracting and sustaining a first class workforce, and a culture of research and scholarship should be integral to all medical schools. A key objective should be to increase the exposure of all medical students and trainees

24 Report of the Academic Careers Sub-Committee of Modernising Medical Careers and the UK Clinical Research Collaboration (2005). *Medically- and dentally-qualified academic staff: recommendations for training the researchers and educators of the future.* http://www.nccrcd.nhs.uk/intetacatrain/index_html/copy_of_Medically_and_Dentally-qualified_Academic_Staff_Report.pdf

25 Darzi A (2008). *High quality care for all, NHS next stage review final report (Department of Health).* http://www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/DH_085825

26 <http://www.acmedsci.ac.uk/p100puid136.html>

to research and to appropriate academic role models. There is an inherent artificiality in regarding academic medicine as a completely separate discipline within the NHS – even more so at a time when the importance of research to the NHS as a whole is recognised – and a risk that identifying individual trainees as ‘academic’ implicitly regards the rest as ‘non-academic’. Flexible opportunities for individuals to enter and exit academic medicine throughout their training and professional career (as recommended in the Report of the Academic Careers Sub-Committee of Modernising Medical Careers and the UK Clinical Research Collaboration) should be maintained and publicised.²⁷

Trainees entering an academic pathway should be supported by the necessary infrastructure, a robust research culture and individually tailored supervision, assessment and support – essential elements to retain trainees within academic medicine and develop their full potential. The development of Clinical Graduate Schools, involving local University/Trust/Deanery partnerships is supported. This would offer an appropriate infrastructure to support trainees and implement mechanisms for joint clinical academic assessment and appraisal. To assist institutions, the Academy has drawn up Supplementary Guidelines for the Record of In Training Assessment (RITA), and the new Annual Review of Competence Progression (ARCP) for Specialty Registrars undertaking joint clinical and academic training programmes. The Guidelines set out a simple, flexible framework for monitoring academic training and progress.²⁸

‘Centres of Excellence’ could provide optimum training grounds for clinical academics, but academic talent in other emerging or surrounding centres would need to be supported and developed. Institutions in a region could link to an established Centre of Excellence, to enable trainees with interest in pursuing an academic career to move easily between centres, or form research training

opportunities or collaborations, for example by having a linked supervisor and access to facilities. The success of this approach would depend on the support of the Postgraduate Deaneries and the relevant Royal Colleges to facilitate movement of academically promising individuals, whilst safeguarding their progression through clinical training.

3. Teaching

High quality teaching is imperative in both training and retaining aspiring clinical academics as they pursue their career pathway. Education and training delivered by research active academics is highly valued and should be retained and encouraged. However, creating research-focussed institutions or centres might risk limiting the range of academic specialties represented, and therefore research-active teaching staff, outside such centres. Teaching would therefore increasingly fall on NHS staff, who already deliver the bulk of clinical teaching in most UK medical schools. It will be important that NHS staff who are active in research and teaching are offered sufficient protected time in their job plans for these activities. Increased teaching capacity could also be achieved by fostering linkages between institutions or centres to provide access to teaching and other facilities – for example by harnessing communications technology.

Teaching should be a recognised and valued role for clinical academics, and excellence in teaching should be encouraged and rewarded (not least by the clinical academic community itself). The Academy is currently conducting a review of the status of teaching and research within biomedical science departments to assess the balance that teaching and research hold, particularly in relation to career progression of non-clinical academics.²⁹ It is hoped that this work will help define how teaching should best be organised in terms of optimal delivery and career progression and recognition.

²⁷ Report of the Academic Careers Sub-Committee of Modernising Medical Careers and the UK Clinical Research Collaboration (2005). *Medically- and dentally-qualified academic staff: recommendations for training the researchers and educators of the future.* http://www.nccrcd.nhs.uk/intetacatrain/index.html/copy_of_Medically_and_Dentally-qualified_Academic_Staff_Report.pdf

²⁸ Academy of Medical Sciences (2007). *Supplementary guidelines for the Annual Review of Competence Progression (ARCP) for Specialty Registrars undertaking joint clinical and academic training programmes.* <http://www.acmedsci.ac.uk/p99puid110.html>

²⁹ <http://www.acmedsci.ac.uk/p47prid59.html>

4. Interdisciplinary training and working

As clinical specialties continue to sub-divide and clinical and scientific departments in medical schools amalgamate, the traditional mapping of a given university department or scientific discipline on to a clinical academic specialty is being lost. However, this offers opportunities to refresh academic work and training, and to promote interdisciplinary working.

Many institutions are taking a thematic approach to focusing their research strategy in broad topic areas such as cancer, cardiovascular disease etc. Academic specialties and other disciplines, such as engineering and other physical sciences, may be co-localised within these themes. Similarly, some institutions are successfully basing their academic medical training on such an integrated system. For example, the successful surgical scheme operating in Edinburgh bases its junior and intermediate training scheme on laboratory groupings; surgical trainees may therefore be placed in a research setting outside of surgery. It is imperative though that appropriate structures and support are in place to ensure the success of the scheme. This includes the provision of a surgical clinical mentor to ensure trainees maintain strong links with the NHS in addition to adequate research supervision. This approach can serve to maintain a thriving local specialty whilst facilitating cohesive research.

Other research centres are also re-energising academic specialties by linking training to disciplines which have not hitherto been regarded as conventional to the discipline. For example, Imperial College and others are establishing links between clinical academic trainees and disciplines such as engineering, bioinformatics and computing.

Such initiatives should be encouraged and supported. Medicine is continually evolving and there is a need to train academics in a range

of non-laboratory based skills such as clinical trials, clinical and biomedical informatics, epidemiology, public health and primary care.

It remains crucial that the initial full time research training of clinical academic trainees (usually while they hold an externally funded research training fellowship) should take place in the very best and most stimulating research environments, which may well involve training in a basic scientific environment pertinent to their clinical academic interest. Many of the funders emphasise this principle when awarding their training fellowships.

Strategies to bolster clinical academic workforce numbers have tended to centre on developing schemes which place trainees within the established clinical academic discipline: the ultimate success of this approach will not be known for some time. An alternative approach to increasing academic capacity in some areas could involve the transfer of research skills between clinical specialties, with the benefits of cross-fertilisation: successful examples include the development of academic posts in paediatric clinical pharmacology and obstetric epidemiology.

5. Developing technology platforms

Innovative medical research is increasingly dependent on access to a range of technology platforms. These have often been developed in the biological and physical sciences but are now directly applicable to clinical research, and increasingly to clinical care through their role in diagnosis and therapy. Examples include mass spectrometry applications (proteomics, metabolomics, lipidomics), high throughput sequencing, and advanced medical imaging. For example, the diagnosis and assessment of efficacy and safety of new therapies for inflammatory, malignant or infectious diseases is increasingly relying on biomarkers. The development and validation of biomarkers

requires expertise in a range of technologies, including genomics, proteomics and imaging. The provision of these cross-cutting technology platforms may require specific support for some traditional academic specialities (e.g. radiology, histopathology, clinical chemistry) which will then need to integrate with a broad spectrum of others in their application. To maximise the potential for future innovation, institutions should be encouraged to view 'technical breadth' as spanning all disciplines – such as engineering, materials science, physics, chemistry, statistics, mathematical modeling and social sciences – that offer interdisciplinary research opportunities. Information Technology will become an increasingly important 'platform' at national level. The Connecting for Health initiative will invest £170 million to develop an

IT system to provide electronic care records.³⁰ It is imperative that the research potential this initiative offers, through the power to create large clinical research databases, is realised as a national resource.

Technological capacity should thus be a priority at the institutional level, coupled with training clinicians in the intelligent use of, and interpretation of data deriving from, technology platforms. The resultant skill base will give an institution flexibility in its research strategy and ensure trainees have opportunities to develop new research avenues. Those allocating funding should take into account an institution's technological capacity and ensure trainees have full access to this resource.

3. Mechanisms for allocating funding

With good intentions, the directing of resource to perceived 'shortage' academic specialties has been prioritised – by specifically awarding ACF and CL posts in the hope of bolstering workforce numbers and reviving the discipline. However, merely attracting individuals to fellowships or lectureships may not guarantee an academic specialty's survival. Increasing workforce capacity has to be coupled with a thriving research environment, attractive and flexible career structures, the provision of support and mentorship.

To ensure that funding and resources are effectively utilised to deliver optimal academic training and benefit for medical research and ultimately improve patient care, a more strategic approach is required in terms of resource allocation to academic specialties at both the national and local level. We note that the NIHR is now adopting a formulaic allocation of ACF and CL training places to each Medical School/ NHS partnership. This formula will be based on the strength of the translational and applied research infrastructure of individual medical schools. It will be important to determine the success of emerging methods of allocation.³¹

Awarding funding 'packages' to bolster capacity

Many schemes fund individual posts, but the support costs to maintain or create the research environment are not included. To ensure that funded clinical academic posts succeed, particularly in shortage specialties, programmatic funding could be awarded to help create critical mass within an institution.

Funders, such as NIHR or DA Health Departments R&D could offer a number of these funding packages per year, for award via open competition. Flexibility would be paramount; the resource requested should reflect the particular

circumstances of the specialty and institution. This approach would help seed expanding research areas and create a network of training centres, each with individually tailored programmes able to meet local need.

CRUK is using the programmatic approach to help bolster capacity in areas such as molecular pathology and radiology.³² The Wellcome Trust is providing integrated clinical training packages both for generic clinical PhD programmes and in shortage areas such as Translational Medicine and Therapeutics (the latter initiative in partnership with the pharmaceutical industry).³³

Academic specialties could be supported through flexible funding packages, for instance a five to ten year research programme could receive funds for a number of junior academic trainees, mid-career staff and a more senior academic post. Funding to create the necessary training and support infrastructure would be a component of the package. Again, evidence of a commitment to encouraging initial research training in excellent research environments outside the host department and specialty should be favoured in funding decisions.

The importance of the NHS partnership

Many current funding schemes, such as the IATP and Senior Clinical Lecturer schemes, require matching funding from a local NHS partner organisation, as a condition of application. There is much to commend this approach, in that it encourages joint strategic planning between Universities and their NHS partners – and is consistent with the record of NHS funding of academic medicine, based on the valid assumption that strong academic medicine contributes to better service development and delivery. However this dependence on the availability of matching

³¹ Department of Health, Best Research for Best Health, Implementation Plan 3.2c, NIHR Integrated Academic Training Pathway for Academic Clinical Fellowships and Clinical Lectureships (2008). <http://www.nihr.ac.uk/about>

³² <http://science.cancerresearchuk.org/gapp/>

³³ <http://www.wellcome.ac.uk/Funding/Biomedical-science/Grants/PhD-programmes-and-studentships/WTD027975.htm>

NHS funding could result in applications from excellent academic environments being limited by adverse financial factors in the local health economy. This might result in very good centres not being able to compete and training posts being allocated on the basis of available matching funds rather than clinical academic excellence. The Academy is not aware of any analysis to determine whether this potential 'confounder' might be having a real effect in skewing awards under the current schemes.

Furthermore, with increasing numbers of NHS Trusts now attaining Foundation status, there needs to be clear incentives set out to encourage financial support for research and academic medicine – for example by including assessment of such support in the Health Commission's performance criteria for Trusts. The Strategic Health Authorities (SHAs) also have a key role to play: they currently hold workforce budgets and should promote the values of teaching and research in the NHS. (The Academy notes they are likely to play a lead role in the creation of the HIECs recommended in the Next stage review.

Flexibility in funding training posts

Flexibility is fundamental to the success of clinical academic training. Research is inherently opportunistic and therefore does not lend itself to workforce planning. To capture the most promising individuals as they are identified and thus capitalise on potential areas of research expertise and excellence, a system of responsive and flexible funding mechanisms should be developed. Institutions should be encouraged to continually identify, appoint and support the best trainees to academic medicine. To enable this, we strongly recommend that a proportion (10-20%) of academic training posts are not allocated to specific specialties but assigned as 'generic' or 'floating' posts that can be used flexibly by institutions.

To ensure training schemes remain fit for purpose, all funders should audit and evaluate all components of the scheme.

4. Attracting and sustaining a first class workforce

Leadership

Leadership at the national, local and institutional level has been identified by many academics as crucial to the success of an academic specialty and designated training programmes.

It has been noted that academic specialties thrive in cycles – mostly attributed to the presence of effective champions within the specialty. Visible leaders or champions are key to fostering an active research culture, by attracting trainees into academic medicine, maintaining a cohort of aspiring clinical academics, and providing exemplars of the rewards of pursuing an academic career.

The Royal Colleges have an opportunity to engage with clinical academic leaders and support their role within their given academic specialties. They might develop 'Specialty Clinical Research Champions' throughout the regions. This could build on the existing model of the AMS/Medical Research Society Clinical Research Champions scheme. In this scheme regional champions are appointed and supported to promote the academic medicine pathway as an attractive career route by hosting regional meetings and social events where trainees and clinical academics meet to discuss pertinent issues and developments.³⁴ The Royal College of Physicians has recently produced a report on 'Coordinating academic training' which emphasises the importance of engagement at regional level.³⁵

Identifying and valuing leaders in academic medicine at national level, in terms of recognition and resource, will provide important incentives to aspire to these roles. In England, the NIHR 'Senior Investigators' award scheme is intended to provide such incentives by creating a cadre of clinical investigators who, it is hoped, will fulfil leadership roles across their respective

specialties.³⁶ The value of leadership training and coaching to support this role, is recognised: effective training should be available to senior clinical academics, as well as those in prominent strategic roles such as Chief Executives and Medical Directors of research institutions.

Developing leadership skills in the future generation of clinical academics will be equally important. Funders are recognising this need and leadership development schemes are emerging, such as that operated by The Health Foundation (THF) for the THF/AMS Clinician Scientist Fellows, who receive individually tailored leadership training throughout their fellowship.³⁷ The outcome of this scheme will not be known for some time, but its evaluation will help inform the development of other schemes and initiatives.

Flexibility

Academic training requires flexibility, in terms of:

1. Availability of entry and exit points at different career stages.
2. The structure of the academic pathway and clinical/research balance of the individual schemes.
3. Mobility – enabling trainees to move to other institutions more aligned to their research aspirations and training needs.
4. Working arrangements, such as supporting individuals with young families or other dependents.

There is evidence that some Specialty Training Committees, at either regional or national level, have adopted a relatively rigid approach to the clinical training needs of clinical academic trainees. Training Committees should be encouraged to adopt more flexible approaches – much of this encouragement should come from a national level by College Training Committees promoting leading regional

³⁴ <http://www.acmedsci.ac.uk/p141.html>

³⁵ Royal College of Physicians (2007). *Report from the Royal College of Physicians Working Group on Co-ordinating Academic Training for Physicians*. <http://www.rcplondon.ac.uk/About-the-college/working-parties/Pages/Academic-Medicine.aspx>

³⁶ <http://www.nihr.ac.uk/faculty/Pages/default.aspx>

³⁷ http://www.health.org.uk/current_work/leadership_schemes/clinician_scientist.html

examples of clinical academic training as best practice, discouraging regional inflexibility towards academic training, and adopting competency based assessment. This should be bolstered by clear and open support by PMETB for such flexible training.

Mentorship support

Mentorship programmes providing individual support to clinical academics throughout their training career are widely considered to be beneficial, by offering independent guidance on how to navigate the clinical academic pathway and meet both research and clinical aspirations. The number of mentoring schemes aimed at trainees are increasing, reflecting a variety of institutionally based schemes and the Academy's National Mentoring and Outreach programme.³⁸ Many other organisations with an interest in supporting aspiring clinical academics are also considering establishing similar schemes. Whilst this is encouraging, it will be important that a coordinated approach is taken in providing this support, to:

1. Ensure that a consistent message and set of operational values are disseminated.
2. Prevent an overlap in funding and resources.
3. Avoid trainees becoming confused by the multitude of support schemes offered by a range of organisations.

The Academy's national mentoring and outreach scheme has recently expanded to offer support and guidance to medical trainees as they embark on the academic pathway and progress to become established clinical academics. In addition to one-to-one mentoring and peer mentoring schemes, we provide regional workshops and events. Our regional activities link to local mentoring schemes, provide opportunities for trainees to network with senior colleagues and peers whilst also providing a forum for knowledge transfer and debate on issues around training, funding and professional development. The Academy's 900 strong Fellowship, located across the UK, allows us to give trainees access to independent research leaders and role models able to inspire and guide those embarking on an academic career. It is hoped the portfolio of support on offer will create a cohort effect amongst trainees, reducing isolation and maximising support and collaboration.

5. Principles and recommended guidelines to assist funders in allocating resources across clinical academic specialties

Guiding principles

Arising from the discussion in sections one to four, the Academy recommends that a more coordinated approach would be advantageous in determining resource allocation to build capacity in clinical academic specialties, and provide the research resource and infrastructure needed to sustain a first class workforce. This approach should take account of future healthcare needs and encompass the devolved administrations to ensure compatibility in research direction and career pathways across the UK.

These principles underlie the recommended guidelines presented on page eight.

1. NHS/Higher Education Institute (HEI) partnerships should be motivated with incentives to promote clinical research capacity and generate a research-aware clinical workforce.

Direct financial incentives to NHS Trusts that help overcome barriers and promote the development of robust partnerships should be extended and performance assessed. Strengthening long-term links between academic medicine and healthcare delivery will help to foster innovative research whilst generating a clinical workforce able to utilise research for patient benefit. Implementing the recommendations of the 'Aspiring to excellence' report and the NHS next stage review will be important in promoting these critical partnerships.^{39,40}

2. Cross-fertilisation of traditional clinical academic disciplines from a wider range of relevant basic and clinical research areas should be encouraged. This may be achieved by:

Incentives to generate new disciplines

Institutions should have funding opportunities to combine more conventional biomedical and clinical disciplines with emerging 'technology platforms' in the biological sciences (e.g. genetics, genomics and proteomics), advances in engineering science (e.g. in imaging, computing, medical device technology and robotics) advances in chemistry, in statistical mathematics and in the social sciences.

Flexibility in funding individuals

Generic training positions that allow suitable individuals to be supported on an opportunistic basis and provide a broad range of training possibilities outside the conventional boundaries of their specialty, should be funded. This approach, matched with appropriate training structures, would populate a broad technical skill base, able to deliver innovative world class research, and reinvigorate particular clinical academic specialties.

3. Sustaining a first class workforce

Valuing academic endeavour and ensuring flexibility in training and career options are fundamental to the success of retaining and developing an academic workforce.

A commitment to extend the many opportunities now offered to aspiring clinical academics beyond the current five year funding cycle would reinforce academic values and continue to foster a spirit of enquiry within the NHS.⁴¹ However, the expansion of these

39 Darzi A (2008). *High quality care for all, NHS next stage review final report* (Department of Health).

http://www.dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/DH_085825

40 Independent Report of the Independent Inquiry into Modernising Medical Careers (2008). *Aspiring to excellence*.

http://www.mmcinquiry.org.uk/Final_8_Jan_08_MMC_all.pdf

41 The recent House of Commons Health Committee report on Modernising Medical Careers, Published on May 8 2008 recommends that the number of centrally funded academic training posts be increased. <http://www.publications.parliament.uk/pa/cm200708/cmselect/cmhealth/cmhealth.htm#reports>

schemes must be coupled with a commitment to ensure that trainees with academic ambition and credentials have opportunities for a long-term academic career. The NHS Consultant post should provide the flexibility to incorporate an academic role and facilitate individuals in achieving their full potential.

Evaluating the success of training schemes and tracking individuals will be key to the intelligent development of the clinical academic pathway. The recommended guidelines on page eight emphasise the components essential in supporting trainees entering the academic track, which should be evolved and refined in accordance with the evaluation findings.

4. Strategic allocation of funding and resource

A strategic approach to funding is required at both the national and local level. This should prioritise flexibility, to take account of the varying needs of individual institutions, and allow for local academic management.

Focussed versus distributed funding

The emerging spectrum of ambitious research infrastructure initiatives such as Academic Health Science Centres, Health Innovation and Education Clusters, Biomedical Research Centres and Biomedical Research Units are welcomed. However, to ensure clarity of function and an integrated approach, it is important to ensure that these initiatives relate synergistically to each other.

A balance between focussed funding of a few centres of excellence versus a more distributed model needs to be achieved. Every medical school or HEI that has academic ambitions should be encouraged to concentrate on their research strengths and develop focused, competitive, research portfolios.

Fostering an integrated UK-wide approach

To support the current investment in the clinical research agenda, greater communication between the funding bodies – as presently occurs under the auspices of the UK Clinical Research Collaboration (UKCRC) in other areas of funding – should be encouraged to ensure appropriate spread of funding and workforce capacity.

Clinical Academic Careers Committee Membership

This paper was prepared by the Academy's Clinical Academic Careers Committee.

Chair

Professor Patrick Sissons FMedSci
Regius Professor of Physic, University of Cambridge

Members

Dr Michael Bannon
Postgraduate Dean for the Oxford Deanery and
Lead Dean for Academic Affairs

Professor Yvonne Carter OBE FMedSci
Pro-Vice-Chancellor (Regional Engagement) and
Dean, University of Warwick

Dr Shiao Chan
Clinician Scientist Fellow, Division of
Reproductive and Child Health, University of
Birmingham

Professor Jonathan Cohen FMedSci
Dean, Brighton and Sussex Medical School

Professor George Griffin FMedSci
Vice Principal (Research), St George's, University
of London

Professor Keith Gull CBE FRS FMedSci
Wellcome Trust Principal Fellow and Professor of
Molecular Microbiology, University of Oxford

Professor Andrew Hattersley FMedSci
Professor of Molecular Medicine, Peninsula
Medical School, Exeter

Professor Julian Hopkin FMedSci
Professor of Medicine, University of Wales

Professor John Iredale FMedSci
Professor of Medicine, University of Edinburgh

Professor Sir Alexander Markham FMedSci
Professor of Medicine, University of Leeds

Professor Peter Mathieson FMedSci
Professor of Medicine and Dean, Faculty of
Medicine and Dentistry, University of Bristol

Professor Patrick Maxwell FMedSci
Registrar of the Academy of Medical Sciences
and Head of Division of Medicine, University
College London

Professor Paul Morgan FMedSci
Professor in Medical Biochemistry and
Immunology, University of Cardiff

Professor David Neal FMedSci
Professor of Surgical Oncology, University of
Cambridge

Professor Peter Ratcliffe FRS FMedSci
Nuffield Professor of Medicine, University of
Oxford

Professor Nilesh Samani FMedSci
British Heart Foundation Professor of Cardiology,
University of Leicester

Professor Pamela Shaw FMedSci
Professor of Neurology, University of Sheffield

Professor Rosalind Smyth FMedSci
Brough Professor of Paediatric Medicine,
University of Liverpool

Professor Robert Stout FMedSci
Professor Emeritus of Geriatric Medicine, The
Queen's University, Belfast

Dr Reza Vaziri
Academic Clinical Fellow in Histopathology,
Barts and the London, Queen Mary University of
Medicine and Dentistry.

Secretariat

Dr Suzanne Candy
Director, Biomedical Grants and Policy
Academy of Medical Sciences



Academy of Medical Sciences
10 Carlton House Terrace
London, SW1Y 5AH

Tel: +44(0)20 7969 5288
Fax: +44(0)20 7969 5298

E-mail: info@acmedsci.ac.uk
Web: www.acmedsci.ac.uk www.academicmedicine.ac.uk