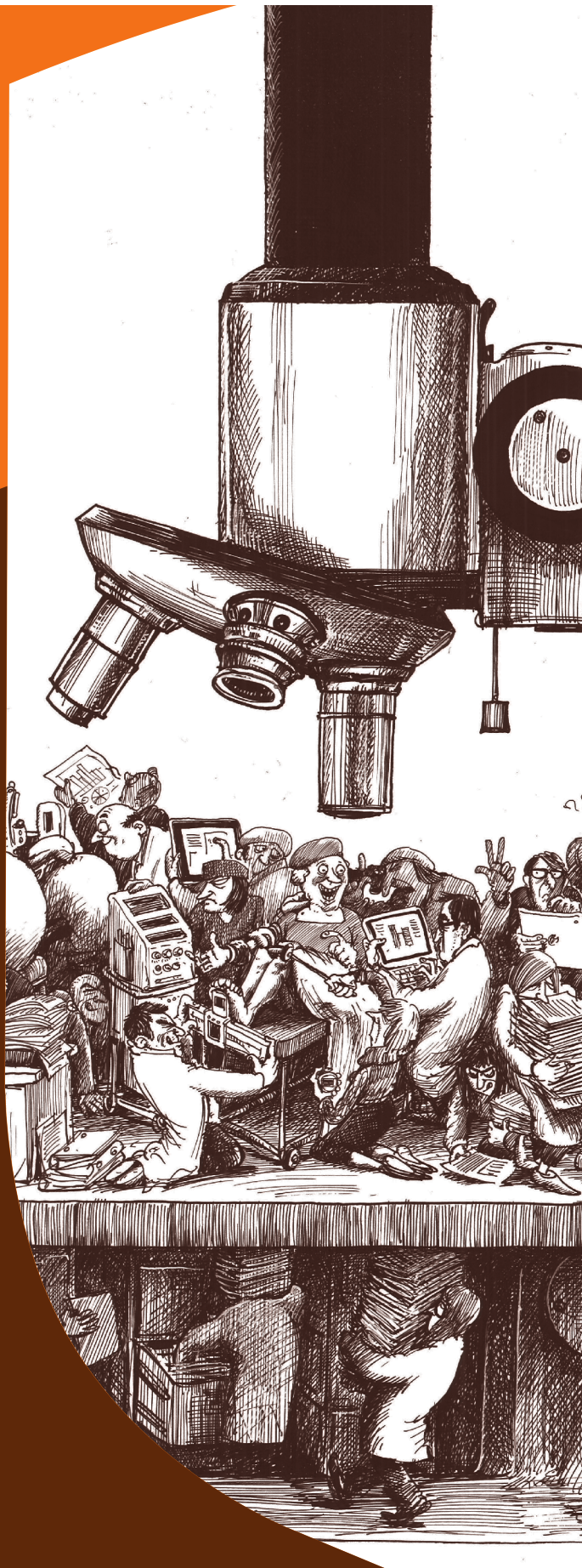
Royal College of Physicians

Research engagement toolkit



Second edition
March 2017

Everyone in healthcare should be committed to ensuring that high-quality research becomes embedded in the core day-to-day work of the NHS, for the benefit of patients and the NHS as a whole. Engaging in research is intellectually rewarding, and is good for your patients, your hospital and your career. We want all doctors to have the opportunity to enjoy what research engagement has to offer and to find the best way to fit research into their career; however, we know that it can be daunting and challenging, especially if you simply don't know where to start.

This toolkit, produced by the Royal College of Physicians (RCP) with support from the National Institute for Health Research (NIHR) and the Health Research Authority (HRA), aims to provide information that will help you to engage in research in lots of different ways.

It provides:

- information about the range of research options and ways to get involved
- information about the different pathways into a career in research, at any career stage from medical student to consultant
- resources to support research-active doctors at all stages in their careers
- case study examples from research-engaged clinicians at all career stages.

We hope that this toolkit inspires you to explore what a career involving research might mean for you.

For enquiries relating to academic medicine and the RCP's work in this area, or if you would like to recommend additional resources that might enhance the toolkit, please contact:

> academicmedicine@rcplondon.ac.uk

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Introduction

Welcome to the second edition of the RCP's research engagement toolkit. After the first edition of this toolkit was published in 2015, the RCP published *Research for all*,[1] a report that highlighted the perceived barriers to research from the perspective of doctors and recommended allowing all doctors who are interested in research to pursue it as part of their career.

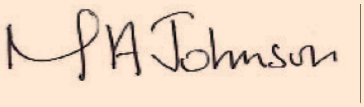
The research sector is ever changing and as such this second edition of the research engagement toolkit includes up-to-date guidance and support for those who wish to become more involved. Research doesn't just provide better outcomes and experiences for patients, as evidenced by a recent article in *Gut*,[2] but it also enhances doctors' careers and, crucially, it provides innovation and efficiencies for the NHS.

As someone who has had the privilege of working with a range of researchers throughout my career and as a specialist in respiratory and HIV medicine, I have had first-hand experience of the satisfaction and reward that research can bring to a doctor's career.

Seeing the benefit to patients that research can bring, whether through clinical trials or quality improvement, really brings to the forefront what it means to be a doctor. It is only through pushing the boundaries of medicine that we can address the challenges that a modern healthcare system faces. The NHS is one of the UK's crowning achievements, so it is fantastic to hear from the National Institute for Health Research's (NIHR's) Clinical Research Network League Table that 100% of trusts are research active and that 60% of trusts increased their activity since last year.[3]

The research culture is something that everyone can contribute to. Highlighting the good work that is going on in your department and sharing your enthusiasm with colleagues can help to encourage others to become involved. A research-engaged workforce benefits everyone, contributes to knowledge about the causes and treatments of diseases and can lead to new ways of working. Research also helps individual doctors to develop professional skills such as team working, mentoring and communication. It is important that everyone is aware of research that colleagues or other institutions are undertaking, so that they can signpost and inform their patients whenever possible and, crucially, research also leads to a fulfilling and interesting career for those who are involved in it.

I hope that you find this toolkit useful. We are continually looking to update this toolkit, so please send any feedback to academicmedicine@rcplondon.ac.uk



Professor Margaret Johnson
Academic vice president

A career involving research

Why engage in research?

Research is extraordinary. Not only does it benefit researchers and their organisations but, fundamentally, it improves patient care. Patients have found that participating in research can help them to understand their condition better and have valued the opportunity to help others in the future.[4] Doctors have found that undertaking research ensures that their knowledge is up to date. It can also enhance their career and be intellectually rewarding.[1,5]

The UK is a world leader in medical research, with an awe-inspiring history of medical advancements such as discovering penicillin, making the link between smoking and cancer and mapping the human genome, to name a few. There are so many reasons why you, your patients and the health system all benefit when you engage in research.

What types of research are there?

'I think it's really important to challenge what it means to do research. Many people immediately think of a laboratory and a microscope but really important changes are also made through combining your daily clinical role with translational research or by improving the way that you and your team work.'

Dr Judith Tweedie, health policy research fellow, RCP

There are many different research areas, types and methodologies, which offer a broad scope for you to discover your area of interest. For example:

- basic scientific research (experimental medicine) – discovering new drug therapies or understanding disease pathways
- translational research – turning early-stage innovations into improvements in human health and treatment
- clinical research – answering clinical questions about patient datasets and changing guidelines and clinical practice
- health services research – leading innovation in healthcare delivery to improve efficiencies in healthcare systems
- health technology research – leading innovations in information technology, such as wearables, telemedicine and assessing the cost-effectiveness of interventions
- epidemiological and public health studies – understanding population health, advancing social policy and improving public understanding of health issues
- medical education research – advancing the design and delivery of educational intervention
- quality improvement and audit research – assessing ways of working and identifying how it can be done better
- implementation research – evaluating how research findings will work with service delivery.

There are many different research methodologies, including:

- laboratory bench work
- randomised controlled trials
- cohort studies or case control studies
- observational studies
- systematic reviews
- qualitative research.

Improving patient care and service delivery

There is evidence to show that research-active trusts have better patient outcomes.[4] Further evidence that was published recently in *Gut*[2] supports the Ozdemir *et al* study that concluded that patients have better outcomes in research-active institutions.[4] Participating in research provides your patients with access to cutting-edge treatments, but the process of engaging in research will also ensure that you are more informed about the literature in your field. It will also hone your transferable skills, which you can then bring to your practice – these are all things that benefit all your patients, whether they are directly involved in your research or not. Moreover, a research-engaged hospital motivates staff, can lead to savings for the NHS,[6] attracts high-calibre doctors to work at your trust and raises the profile of your organisation.

Participating in high-quality research is not only beneficial to your patients and your organisation, but it also benefits the wider population and the health service as a whole by leading to the development of more effective, high-quality, cost-efficient treatments and healthcare delivery models. Promoting innovation within the NHS is essential for the future of patient care and for developing a sustainable model of care.

Career enhancement

There are many ways that getting involved in research can benefit your career. As well as presenting an intellectual challenge and being highly rewarding, a career in research opens up many opportunities, including working abroad and travelling the world to present at conferences. Involvement in research looks good on your CV and it may enhance your future career opportunities. It also fosters collaboration and provides you with the opportunity to meet new and interesting people who have similar interests to you.

Professional development

Doctors are necessarily intelligent and analytical, and clinical practice hones many skills that make them suited to research, such as team working, communication and analytical thinking. Not everyone will choose to pursue a long-term career in research. However, any time that you spend in research is valuable because it will equip you with many skills, including an understanding of statistics, systematic reviewing and critical appraisal, and the ability to synthesise evidence and publish findings, which will be useful throughout your career. You can expand your skills through taking a master's degree or other shorter courses as an alternative to a PhD. Such courses also provide skills that are transferable to clinical practice and directly benefit patient care, such as time management, prioritisation, team working, communication and leadership, as well as engaging you with the cutting edge of your field.

How can you engage in research?

There are a wide range of research activities that doctors can engage in, depending on your skills and interests. For example:

- disseminating research findings
- recruiting patients to trials
- performing laboratory benchwork
- conducting systematic reviews
- being the lead investigator on a clinical trial
- leading your own research team
- undertaking audit
- quality improvement
- developing new research methodologies.

You can find out about the range of roles in research through a series of short videos from the perspective of a trainee, a senior investigator and a chief investigator.

'My advice to those who would like to pursue research is to go for it! There are increasing opportunities around foundation jobs and fellowships that give a taste of research so you can see whether it is for you. I'd also advise people to try out different areas – it's important to find the right niche, given the time and investment you will be making.'

Jamie Read, academic clinical fellowship (ACF) in medical education / geriatric ST2

Does a career in research come at the expense of clinical practice?

Definitely not! While some doctors commit significant time to research, it is very common to be involved in research alongside clinical practice. Clinical researchers are well placed to translate research into practice and to think of new research questions that arise from their clinical observations and experience. The different types of research, listed above, all take different time commitments, so you can find what's right for you: from leading research projects full time, to simply familiarising yourself with current trials in your field so that you can be a prolific recruiter of patients – which doesn't take you out of the clinic at all.

With increasing pressures in the health service, it is important that protected time for research is taken into account – don't be too shy to ask for it! It can make a big difference, and a lack of protected time was highlighted as one of the biggest barriers to engaging with research in *Research for all*.[1] It is important to be persistent and ask for protected time to do your research. Speaking with your research and development (R&D) director can help you to gain the support that you need for this, so making contact with them is a good place to start.

You can read a blog post written by Professor Margaret Johnson, RCP academic vice president and researcher, about how to address some of the common barriers to research.

Eligibility requirements

The good news is that there are no strict entry criteria for engaging in research activity. If you have an enquiring, analytical mind and you enjoy solving problems, you are likely to find a career in research rewarding. Doctors naturally possess many of the key skills that are needed for a successful research career, including team working, good communication skills, self-discipline and motivation – and the rest can be learned!

Don't be put off if you have no prior experience – some of the skills that are needed in research are different from those used in clinical practice, but you'll be supported to learn these skills or to gain access to people who already have them. There are opportunities to attend courses to develop specific skills or to complete higher qualifications within your research training. However, you do not need to have a command of all research skills (for example conducting statistical analysis), because research groups are composed of individuals who have diverse and complementary skill sets.

You also do not need a PhD to engage in research. Ultimately, if you aspire to conduct your own research and to lead your own research team, you may be supported to complete a PhD through your research training or as part of your professional development. But, equally, there are many opportunities to continue to undertake research alongside your clinical work.

How can I find out more about a career in research?

If you are interested in getting involved in research but you are not sure what type of research you are interested in, or if you would like to gain more experience before you apply for a grant or research training, spend time with your local research group or R&D department or speak to other clinicians who are engaged in research: they will be happy to provide insights and to share their experiences.

Funders frequently provide information about recent projects that have received funding or about their upcoming priorities. There are also a range of networking sites for researchers and those who are interested in finding out about the research that is taking place. For example:

- Piirus is a collaboration network for people who are interested in or currently doing research and are looking for other individuals who are in a similar field
- ResearchGate is a networking site for scientists
- Vitae supports the professional development of researchers.

Conferences and courses are a great way to network and to find out more about a career in research. They also offer an opportunity for you to present a poster or give a presentation in your chosen specialty. Some relevant conferences are listed below.

- The National Student Association of Medical Research conference provides an opportunity for medical students to present their work and find out more about a career in research.
- The British Medical Association holds a conference for clinical academic trainees to discuss how to make the most of training.
- The Academy of Medical Sciences holds workshops and events all over the UK for:
  - clinical academic trainees – to provide information about navigating the clinical academic training pathway and developing a research career
  - biomedical researchers – to provide advice and information on developing a research career
  - postdoctoral researchers – to develop practical skills and to network with senior colleagues.

Twitter is a great place to explore what is going on with research and to find out about cutting-edge research developments, events and opportunities for funding. A few organisations to follow on Twitter include:

- the Royal College of Physicians (@RCPLondon)
- the Medical Research Council (@The_MRC)
- the Wellcome Trust (@wellcometrust)
- the Association of Medical Research Charities (@AMRC)
- the Academy of Medical Sciences (@acmedsci)
- NIHR Research (@OfficialNIHR)
- NIHR Clinical Research Network (@NIHRCRN)
- NIHR Dissemination Centre (@NIHR_DC)
- Department of Health (@DHgovuk)
- Biotechnology and Biological Sciences Research Council (@BBSRC).

Ask your local R&D department what research is going on in your trust. R&D departments have oversight not only of what research is already going on but also of the facilities and capacity of your organisation for undertaking research, and of ensuring appropriate governance and compliance.

Standard and alternative training pathways into a career involving research

Top five tips from Andrew Carson-Stevens, GP and NIHR health services and delivery research chief investigator:

'Securing your first big project grant can be time-consuming, fraught with many rejections before success, and require a lot of pre-work even just to apply. It's competitive and the funders have a big responsibility to allocate finite resources. So don't wait for your big break, work for it; here are some ideas to prepare you to maximise resilience for the challenges and opportunities ahead:

1 **Got an idea? Apply for 'corn seed' funding to help nurture a small idea into a larger one. The preliminary findings can be used to inform your plans for the next big proposal, as well as reassure grant peer reviewers that you have evidence for the strong degree of belief in your proposal.**

2 **Got a vision? Articulate the goals you expect to achieve and work backwards from each goal and identify the key concepts (and accompanying ideas) that you think are needed to achieve the vision. Ensure that every member of your team can identify how his or her work helps to achieve the vision.**

3 **Got no money to hire researchers? Be resourceful and plan creatively to enable you to achieve your goals. Students and junior doctors can make insightful, hardworking research assistants. Be clear about what is expected from them. Have courage to be flexible with their schedule and consider how to determine whether they are on or off track. Have curiosity to learn what can realistically be achieved by your volunteers, ranging from half a day (one clinical session) and upwards by testing this out: different tasks, complexity, skill set required, level of clinical training. Learn from failures. Have a process for capturing the learning.**

4 **Identify and nurture talent. Medicine has no shortage of very good people, although not everyone gets the support they need to be brilliant. Give those supporting you the same opportunities you had or even wished you had. Negotiate funds where possible for them to attend seminars and to present posters and oral presentations at conferences, and encourage them to write first drafts of manuscripts and assume the responsibility of first author. Consciously make the effort to determine their strengths and weaknesses – try them out in different roles and responsibilities that will enable the team to be productive, where they will willingly contribute 110% and where they can find autonomy to grow further and work towards independence. This process is time-consuming but very rewarding.**

5 **Surround yourself with experienced mentors from research, education, policy and other subject disciplines. Identify who you enjoy thinking with, and those you feel you can trust with your ideas that will one day change the way that medicine is practised to deliver safer, better quality care for patients. Be a student for life, embrace humility and find enjoyment in being challenged.'**

It's never too late to get involved in research – there are many entry routes into research training at all stages throughout your career. *Research for all* showed that many people develop confidence in their skills and an interest in research at a later stage.[1] Consultants are also more likely than junior doctors to have built up their networks of contacts. There are opportunities to become a researcher at any point, whether it is working in collaboration or independently.

Medical students

'I was exposed to the usual analysis of biomedical research papers in medical school, but my interest in research was not ignited until I investigated research in medical education. I was fortunate that my medical school placed a large emphasis on qualitative research into education, something that I found especially fascinating because I was experiencing the benefits of this research first hand as a medical student.'

Jamie Read, ACF in medical education / geriatric ST2

If you know that you wish to combine your clinical career with research, there are plenty of opportunities to get experience as a medical student. You can get involved through student-selected modules, intercalated BScs (with the potential to extend to a PhD), student research societies, working with local research groups and summer internships. This will enable you to explore your interest, will provide an introduction to research methodology and will create opportunities for you to present your work at conferences. Arrange to talk to someone in the specialty that you are interested in who is interested in research and has a track record, and offer to get involved in their work. Although it is not essential, a track record of high academic performance, attaining a first-class degree with distinctions or honours, winning prizes, presenting at conferences or publishing work as a student will make you more competitive in your application for an academic foundation programme (AFP).

Useful resources for students

- The National Student Association of Medical Research is a student society, funded by the Wellcome Trust, for medical students who are interested in research. It offers a mentorship programme and provides a database of projects that you can get involved in.
- The UK Medical Students' Association has a bank of research projects for students to get involved in and provides information about research studentship opportunities.
- AcaMedics offers a bank of research projects for students to participate in and it supports students to present at conferences and publish their work.
- The Wellcome Trust offers a summer internship programme that funds students to complete a 6–8-week project between university terms.

Trainees

'I took a very personal route to medicine: a degree and PhD in chemistry, followed by several years in the pharmaceutical industry making tablets and vaccines. Eventually, I wanted to know why they worked and I wanted to be able to prescribe them. During a 6-year medical degree in the Czech Republic, I kept asking questions, and publishing a research article as an undergraduate served to whet my appetite for more. I am now in the third year of an ACF, and applying for a transitional research fellowship that will reinvigorate my rusty research skills and bring me up to date. After that, a whole spectrum of opportunities that will benefit patients awaits.'

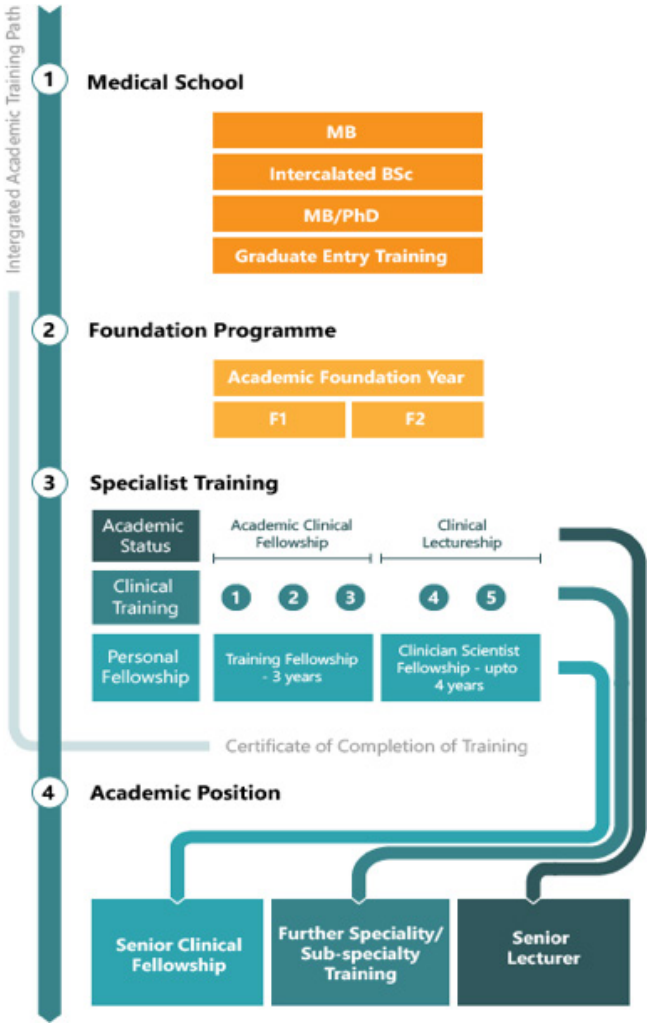
Catherine McGrath, ACF in rheumatology (ST3)

Integrated academic training pathways

Integrated academic training pathways offer formal training in research alongside clinical training. The UK Foundation Programme's *Rough guide to the academic foundation programme* provides a comprehensive overview of both the AFP and the post-AFP academic career pathways in the four nations of the UK.

The Medical Research Council offers an interactive career framework to show you how you can progress your career within academia or industry, and some of the funding that is available to support you. Fig 1 also provides an outline.

Fig 1



'Through my interests, I was able to become involved in some small-scale research projects, and I then undertook an academic F2 post in medical education. This allowed me to formalise my research role and expand my knowledge of medical education, which was complemented by undertaking a certificate in education. This has subsequently developed into a master's project that I am undertaking this year.'

Jamie Read, ACF in medical education / geriatric ST2

England

In England, the NIHR Integrated Academic Training Programme enables doctors to combine research with clinical practice. The pathway is designed to be flexible and can be joined or re-joined at various points. Once you are in an integrated pathway, movement between the different stages of the pathway is encouraged and supported. Entry to the scheme is through open, competitive recruitment at each stage, ie you do not need to have completed the first stage (of the AFP) to apply for the next stage of the pathway.

- The academic foundation programme (AFP) presents newly qualified doctors with the opportunity to spend up to 4 months in academia.
- Academic clinical fellowships (ACFs) enable trainees to spend 25% of their time during specialty training developing research skills and being supported to prepare an application for a PhD. The ACF is for a maximum of 3 years (4 years for GPs). Trainees may then be able to apply for a PhD that is funded by the NIHR, the Medical Research Council, the Wellcome Trust or other charities / funding bodies.
- Having completed a PhD, academic trainees can apply for an academic clinical lectureship (ACL), which allows trainees to spend 50% of their time undertaking research while they complete specialty training over 4 years.
- Those who wish to continue on an academic path and to lead research can apply for a 5-year Clinical Scientist Award, which bridges the gap between completing specialist training and gaining a more senior research post, such as a senior clinical research fellow or honorary consultant.

You can find more information about the academic training programme on the NIHR Trainees Coordinating Centre's website or from your local education and training board (LETB).

Scotland

There are no ACF or equivalent posts in Scotland. The Scottish Clinical Research Excellence Development Scheme (SCREDS) provides doctors with opportunities for academic training throughout their post-AFP career.

The NHS Education for Scotland website provides further information about the Scottish academic training programme.

Northern Ireland

Trainees in Northern Ireland are eligible to apply for ACFs and ACLs from ST3+. More information about clinical academic training in Northern Ireland can be found on the Northern Ireland Medical and Dental Training Agency website.

Wales

The Welsh Clinical Academic Track (WCAT) fellowship programme provides run-through lectureship training posts for post-AFP trainees in Wales. For further information about the posts and how to apply, visit the website.

Alternative pathways

'It took me a while to get involved in research, having not shown much interest in medical school, but as I got more interested in public health, I surprised myself by enjoying learning the practical applications of statistics – it was rather addictive!

Tamsin Newlove-Delgado, doctoral research fellow and specialty registrar in public health

Don't be put off if you are not on an integrated academic training pathway – there are many routes into a career in research. You can pursue independent research jobs, fellowship schemes or PhDs at all career stages alongside your clinical role or assist others in their research by recruiting patients. Research jobs are advertised on medical recruitment websites such as NHS Jobs and the Medical Schools Council's Clinical Academic Jobs website, as well as in medical journals including BMJ Careers' university research and fellowships section, and the websites of the major medical research charities and individual universities and trusts.

It can be challenging to negotiate having time away from clinical practice, but securing funding can help. To get started, speak to academics at your local university, your hospital R&D department or the local clinical research network to find out what is going on in your field of interest and to find a research-active mentor to support you through the application process. Further information on how to get started is available in the 'Research activity in your locality' section later in the toolkit.

Local, audit and quality improvement research

You can also get involved with research as part of your clinical role. Quality improvement and audit work are important ways of improving care within a hospital through research. There could be studies that are already taking place that you can get involved in, or you can conduct your own study. The first place to start would be by talking to the R&D office or research champions within your organisation.

In preparation, you can undertake a short course on how to develop your skills in quality improvement research, such as the RCP's 'Learning to make a difference: quality improvement for consultants' workshop. You can also visit the RCP's Quality Improvement Hub for more information on this type of research and to access resources that can help you to get started, including webinars on context, a guide to methods and a guide to evaluation. Courses from the RCP Quality Improvement Hub will begin in the spring of 2017. The Royal College of Paediatrics and Child Health (RCPCH) also has free e-learning courses on clinical audit that can support you to develop your skills in this area of research. For an overview of what constitutes quality improvement, you can read a quick guide by The Health Foundation.

Developing new skills in research

Useful resources for trainees

- The annual British Medical Association (BMA) Clinical Academic Trainees' Conference gives academic trainees opportunities to network and to have their questions answered by leading clinical academics.
- The Academy of Medical Sciences' Spring Meeting for Clinician Scientists in Training is a cross-specialty event that is designed to bring clinical academic trainees together to present their work, to build relationships and to network with senior scientists.
- The BMA Conference of Medical Academic Representatives (COMAR) provides an opportunity each year for medical academics from across the UK to meet to discuss key issues, to share experiences and to set priorities for the BMA Medical Academic Staff Committee for the coming year.
- The NIHR Trainees Coordinating Centre runs an annual 2-day National Trainees Meeting for all NIHR-funded trainees. This meeting allows trainees to present their work, to network, to hear from senior NIHR health researchers and to learn more about the NIHR.
- The Medical Research Council has a Regulatory Support Centre that can provide short e-learning courses on issues such as tissue regulation and data protection. The Medical Research Council also has an online guide that can help you with the ethics approval process and toolkits on clinical trials or the use of data, which can guide you through specific elements of research.

Consultants

It doesn't matter if you have had no prior research experience – it is never too late to get involved in research. Many top researchers established themselves later in their careers as their expertise and networks developed. There are grants and fellowships that are open to consultants to take time out of clinical practice for research training, leading research projects or pursuing further degrees (see the 'Alternative pathways' section on the previous page).

Recruiting into a portfolio study is a good way to initially dip into the research world. The NIHR Clinical Research Network provides support to consultants to design, develop and lead clinical trials or for those who recruit into portfolio adopted clinical trials. You can then get in touch with the national programme. You can find out more about portfolio studies on the NIHR website or from your local R&D office, who can put you in touch with your specialty Clinical Research Network leads.

Of course there are never enough hours in the day, and time is a common barrier that is faced by consultants who want to carry out research. The RCP supports protected time for doctors, which is devoted to supporting professional activities such as audit, teaching, continuing professional development (CPD), research, appraisal, assessment of trainees, clinical governance and service development. When you are negotiating protected time with your trust, they are more likely to support you if you can demonstrate the benefits for your organisation, so have a think about the following.

- What transferable skills will you develop and how will your patients benefit from them?
- Will you bring in funding?
- Will you raise the hospital's profile by publishing results?
- Will the project provide opportunities for others to develop their skills?
- Will it be a 'good news story' that the trust can promote on their website etc?
- Will it create opportunities for collaboration and learning from other colleagues?

The BMA can help to support you in negotiating your contract.

Returning to research

If you are a researcher who is returning from a career break, the Daphne Jackson Trust can help you to get back into research with their fellowship scheme. Also, the Welcome Trust offers research career re-entry fellowships in addition to tips and advice, including a blog with posts from individuals with first-hand experience.

Research activity in your locality

Local research groups

A good first step is to speak to local academics in your university or organisation, to find out what research is being conducted in your area of interest. If you do not already have a link with a lab or research group, look online to find their contact details and specialty. Researchers generally love talking about their work and are delighted to have new people take an interest in research, so don't be shy! They will generally welcome you approaching them. If you see a research paper that you are interested in finding out more about – approach the author. They are usually more than happy to answer any further questions that you have and it can be a great way to expand your networks.

League tables

The good news is that, since 2016, all trusts are engaged with research, though to varying degrees and in varying specialties. Promoting the research culture within your organisation is a great way to enhance this, so don't be afraid to start asking questions – get the conversation started.

The Research Activity League Table,[3] which is published annually by the NIHR Clinical Research Network, provides a good overview of research activity by geographical area. The League Table shows the number of clinical research studies that took place in each NHS organisation over the last full year, and the number of patients who took part in the studies. It allows NHS organisations to compare their performance with other organisations of the same size and type, so you will be able to see how your trust is performing in research and to identify projects that interest you.

Research and development (R&D) departments

R&D departments offer a wealth of expertise about local research and can signpost you to colleagues within your trust who can share their experiences and knowledge about conducting research. Communication across your trust and with the research networks is really important to ensure that your study runs smoothly and to time and budget. It will be useful for you to find out more about how they support research and ensure governance and compliance. To find out more about the work of R&D departments, you can visit the NHS Research and Development Forum website, which will state the R&D contact in your area.

The R&D department can help you with:

- assessing local capability
- safety and risk assessments
- financial management of awards
- promoting the research culture
- monitoring and auditing studies
- issues concerning intellectual property.

To see the full range of assistance that your R&D office can provide, you can view the Research and Development Forum's infographic.

Clinical research networks

Top tip:

If you are not sure where to begin or what is right for you, the NIHR's Clinical Research Network and Research Design Service can provide support and advice to help you to navigate the research environment.

As a first step, one of the best ways of finding out what research is happening in the UK is to get in touch with your Local Clinical Research Network (LCRN). These networks have been established in England, Scotland, Wales and Northern Ireland to provide the infrastructure to support the delivery of clinical studies, to create a research environment in which high-quality research can thrive and to attract, develop and retain the best research professionals. The network is not only a great place to start if you are interested in research, but it also provides essential support for principal investigators.

Some of CRN activities include:

- ensuring national consistency
- gathering national data intelligence
- globally promoting the research offering
- advising on regulatory approvals
- signposting to resources such as costing templates or ways to embed the research culture in your organisation
- identifying other appropriate sites and patient pools.

The CRN national helpdesk can assist with queries, help you to find any further support that you need, or signpost you to learning and development opportunities. You can also find out who your local CRN contact is on the NIHR website.

NIHR Study Support Service contact details

www.supportmystudy.nihr.ac.uk
supportmystudy@nihr.ac.uk
0113 3434555

You can also gain support through the NIHR Research Design Service, which provides design and methodological support to researchers who are writing for peer reviewed grants. Or you can listen to the *Business of discovery* podcast series by Professor Allan Gaw, which discusses specific topics such as clinical trial recruitment.

Establishing yourself as a principal investigator

The Medical Research Council has a New Investigator Research Grant to support those who want to take a step towards being a principal investigator. The NIHR also runs a Principal Investigator Oversight Masterclass to improve practice and to increase oversight during set-up and throughout clinical trials.

There are also several articles that give tips about becoming a principal investigator, such as Don't wear your new shoes (yet): Taking the right steps to become a successful principal investigator. Vitae also provides advice and training on becoming a principal investigator, along with advice about general career development for researchers.

England

In England, the NIHR provides the infrastructure to support health research. The NIHR coordinates a vast range of centres, units, facilities and networks that work together to conduct leading-edge research for patients – you can contact the NIHR about your area of research interest.

- The NIHR Clinical Research Network is composed of 15 local clinical research networks that support clinical research across 30 clinical specialties. You can search the network to find research in your area.
- There are various Biomedical Research Centres and Biomedical Research Units across the UK that conduct and support translational research to transform scientific breakthroughs into life-saving treatments for patients.
- NIHR Collaborations for Leadership in Applied Health Research and Care (CLAHRCs) undertake high-quality applied health research. The 13 NIHR CLAHRCs primarily focus on research that is targeted at chronic disease and public health interventions.
- Translational Research Partnerships foster early collaboration between leading researchers and the life sciences industry in the development of new drugs and other interventions, to ensure that scientific ideas are applied to patient need.
- Translational Research Centres work with industry on drug, device and diagnostic development. There are two Translation Research Centres: one in joint and related inflammatory disease and one in inflammatory respiratory disease.
- Two Patient Safety Translational Research Centres support research that is focused on improving the safety, quality and effectiveness of NHS services. Further infrastructure funding will be awarded in August 2017.
- Nineteen Clinical Research Facilities for Experimental Medicine support collaboration between basic and clinical scientists to help speed up the translation of advances in research into improvements in healthcare.
- Fourteen Experimental Cancer Medicine Centres speed up the process of cancer drug development and the search for cancer biomarkers.
- The Dementia Translational Research Collaboration aims to translate basic science to benefits for patients in the area of dementia research.
- The Rare Diseases Translational Research Collaboration aims to provide patient-centred research into rare diseases.
- The Medical Research Council / NIHR National Phenome Centre studies the phenome, to determine how the environment and genes combine to affect biochemical processes that lead to disease.
- The NIHR BioResource is a panel of thousands of volunteers, both with and without health problems, who are willing to be approached to participate in research studies.
- The NIHR National Biosample Centre provides biosample processing, storage and retrieval services.
- The NIHR Health Informatics Collaborative brings together five of the country's leading NHS trusts with large NIHR Biomedical Research Centres, to make NHS clinical data more readily available to researchers, industry and the NHS community.

Other research institutes include:

- The Francis Crick Institute – an interdisciplinary biomedical research institute founded by the Medical Research Council, Cancer Research UK, the Welcome Trust, University College London (UCL), Imperial College London and King's College London
- Wellcome Trust Sanger Institute – a centre of research for genomic study
- Cambridge Institute for Medical Research – a partnership between basic and clinical research that aims to understand the cellular basis of disease
- Heart Research Institute – an institute for cardiovascular research.

Wales

Health and Care Research Wales supports the design and delivery of high-quality research via:

- five Biomedical Research Centres
- three Biomedical Research Units
- three Infrastructure Support Groups
- three Clinical Trials Units
- School for Social Care Research.

You can sign up here for a weekly update on funding and training opportunities in Wales, to stay informed about new developments that are available to you.

Scotland

The Chief Scientist Office in Scotland supports health research and provides a number of funding opportunities and fellowships.

Grants include:

- Researcher Initiated Grant Scheme
- Scottish Government Policy Priorities Scheme – coming soon
- Catalytic Research Grants Scheme

The Chief Scientist Office also funds six Research Units, which promote excellence within their field.

- Health Services Research Unit
- Health Economics Research Unit
- Institute of Hearing Research
- Nursing, Midwifery and Allied Health Professions Research Unit
- Social and Public Health Sciences Unit
- Scottish Collaboration for Public Health Research and Policy

The charity Medical Research Scotland also provides a range of funding opportunities, and NHS Research Scotland can provide further support regarding research in the NHS.

Northern Ireland

The Northern Ireland Clinical Research Network (NICRN) provides research infrastructure as part of the UK Clinical Research Network. The NICRN coordinates clinical research across trusts and academic organisations, maintains a portfolio of network studies and assists with all aspects of study delivery. The network coordinating centre is based at the Royal Victoria Hospital in Belfast, and it coordinates nine NICRN interest groups (cardiovascular, primary care, children's, respiratory, critical care, stroke, dementia, diabetes and vision).

The European Union

Funding from the European Union's (EU's) research funding programme, Horizon2020, will be available until the UK leaves the EU, and further information will be available about funding beyond that point in due course. In the meantime, the UK government has announced that it will underwrite the funding until the UK leaves the EU. The European Commission has stated that the decision for the UK to leave the EU should have no immediate impact on researchers but if you do experience problems, please report any issues to Research@beis.gov.uk. For further information on the RCP's response to the impact of Brexit, you can read the RCP's consultation response to the House of Commons Science and Technology Committee Inquiry.

A wide range of funding opportunities are available through Horizon 2020, particularly the Health, Demographic Change and Wellbeing challenge. Marie Curie fellowships are also available to researchers in any discipline from any EU country. The fellowships allow not only funding for research, but professional development support to a range of career stages.

The NHS European Office can provide further information or assistance with your application.

UK Clinical Trials Gateway

The NIHR's UK Clinical Trials Gateway provides information about most clinical research trials that are running in the UK, and it is searchable by research topic or geographical location. It aims to enable patients and clinicians to locate trials that they are interested in and to contact the researchers who are involved. The NIHR has a useful toolkit that can provide more information on designing and conducting publically funded clinical trials in the UK.

Getting involved in research

Finding a supervisor

A supervisor is an experienced academic who provides guidance and support throughout your research project, from planning to publication.

Tips for finding a research supervisor[7,8]

Working relationship

- Your choice of supervisor is intimately linked to the topic of your project. Choose a supervisor who has similar interests to your own and who you get on with – you will be spending a lot of time together and their interests will soon be your interests.
- What is their approach to ownership and authorship of published work?

Experience and availability

- Finding a clinician supervisor may work well if your project is clinically based, but they may be around less, owing to clinical commitments. A scientist may be able to supervise you more directly, but a senior research scientist may have a number of other commitments and projects. A combination often works best, and you should seek support and mentorship from the most appropriate individuals, irrespective of their professional background.
- Work with people who are successful. Find out about their track record – how many of their research projects have resulted in high-impact publications and international presentations?
- Ask trainees who have previously worked with your prospective supervisor about their experiences. Did they complete their degrees? Did they get presentations and publications? How did they progress in their academic careers? How many trainees has your prospective supervisor had experience of supervising?

Working environment

'The most enjoyable and productive time of my career so far highlighted for me the importance of conducting research in a friendly, supportive and collaborative environment.'

Pearse Keane, NIHR clinician scientist and consultant ophthalmologist

- Whether you are undertaking basic science research or allied health research, visit the laboratory or research department and consider the following.
  - Do you like the set-up?
  - What projects are other team members working on, and how will your project fit in?
  - Is there a precedent for medics being part of the research group?
  - Are training and support available?
  - What is the size of the research group and how do they work together? Will you fit in?
  - What is the size of the facilities – is there room for you?
  - Do they collaborate with other research groups?
  - Importantly, is there a good research culture?

'Collaborative work is just that; any success that I have had has been due to the success of the group rather than me as an individual within it.'

Tom Clarke, consultant in adult critical care and anaesthesia

And remember!

Don't be shy about approaching someone – researchers love to talk about their work and are delighted when new people want to contribute to advancing medical knowledge. Even if they are not the right fit for you, researchers will not mind putting you in touch with a colleague or acquaintance who might be. A mentor may be able to provide valuable support, you can find out more about mentoring later in this toolkit.

'Like most medical students who do a BSc, I was given the opportunity to choose a research project. With my first poster under my belt, I felt confident enough to approach my clinical supervisors to ask whether there were any research audit opportunities. Most were extremely forthcoming and supportive, and suggested various projects that I might like to get involved with, some of which I am still working on 5 years later.'

Sonia Szamocki, foundation year 2 doctor working in ophthalmology

How do you choose a research project?

If you don't already have a clinical question that you wish to answer, here are some great places to start:

1 Discuss your interests with your supervisor or research group. While it is preferable to develop your own ideas, they may have a project in mind that they have not yet had the capacity to conduct to get you started.

2 Take a look at the James Lind Alliance's database of priority research questions, which have been devised via a process of thorough consultation with patients who have experienced the relevant conditions.

3 Read systematic reviews of your topic of interest to identify unanswered or further research questions.

4 The Innovation Observatory provides information about emerging health technologies that may have a significant impact on patients or the provision of health services in the near future.

It is important that you have a genuine interest in the research area – you may spend months, or even years, of your life working on it and it may be frustrating at times.

'I would urge anyone choosing a project not to be afraid to design one yourself, rather than simply picking one from the list. You will learn a great deal about actually planning a feasible project by yourself and bringing resources together.'

Sonia Szamocki, foundation year 2 doctor working in ophthalmology

Patient and public involvement in research

'Quality research and quality clinical care go hand in hand, and so being at the cutting edge of a subject means that I know my patients are getting the best care available.'

Charles Ferro, NIHR fellow, consultant nephrologist and honorary reader in renal medicine

'To many patients, research suggests involvement in a large clinical trial. However, improvement in the NHS is mostly about doing things better and this is where patient involvement is critical. Simple studies such as electronic provision of appointments, prescriptions and doctors' letters will lead to savings in time and reduced risk of error. Think small and have a big impact.'

Derek Calam, member of the RCP's Patient and Carer Network

Patient and public involvement in research is a requirement of all research studies and is an indicator of quality research. To generate improvements that meaningfully benefit patient care, patients must be at the heart of research, advising and informing research design and contributing to the measurement of improvements.

Patients want to be involved in research. A survey by the NIHR Clinical Research Network found that 95% of people said it was important to them that the NHS carries out clinical research, 9 out of 10 people would be willing to take part in clinical research and only 3% would not consider it at all.[9] Patients' perspectives can be a powerful driver for clinicians to want to engage in research.

Even if you are not actively recruiting patients to trials or leading research, if patients ask you about research, you need to be able to answer their questions, to know about opportunities for them to engage in clinical trials and to know where to direct them to obtain further information.

Opportunities for patients to get involved in research

'As with most things these days, time and money are the major challenges facing any potential researcher. However, there are more opportunities now than ever before, especially for those who want to carry out research that is directly relevant to patient care.'

Charles Ferro, NIHR fellow, consultant nephrologist and honorary reader in renal medicine

Patients can get involved in research by:

- offering advice and experience to researchers
- helping to identify research priorities
- participating in a focus group / completing a questionnaire as part of a research study
- being recruited into a clinical trial
- being a member of a research project advisory group
- influencing study protocol design
- influencing research study design
- helping to design patient information leaflets or other research materials
- helping a research funding body to decide how to allocate money for research
- recruiting other patients into clinical trials
- being a co-applicant on a research project
- helping to deliver research, eg by interviewing research participants
- helping to disseminate research findings.

What are patients' experiences of research?

'Research changed my life' from the NIHR shares inspirational stories from patients, families and carers whose lives have been transformed by clinical research.

Some of the benefits that patients gain from participation in clinical research include:

- a better understanding or management of their condition
- additional contact and partnership with their health professionals
- being able to give something back to the NHS and contribute to better treatments.

How to involve patients in research

Information for patients

The NIHR provides a comprehensive guide for patients, which highlights the ways that they can get involved in research. It provides links to videos of people talking about being part of a clinical trial: how they made the decision to take part, what was involved and what their experience was like.

OK to ask encourages patients to ask their doctor about whether there are any current trials that would be suitable for them

INVOLVE, which is funded by the NIHR, provides information about ways in which people can contribute to research without taking part in a trial. There is evidence that when patients and the public are involved in the way that research is designed, funded and managed, it is more likely to produce results that improve healthcare practice.

People in Research is a web resource run by INVOLVE that helps to put members of the public in touch with organisations and researchers who want to actively involve people in clinical research.

Further information about patient and public involvement can be found on the NHS Choices website.

Information for doctors

The NIHR provides a wide range of advice and support for doctors about how to make patient and public involvement in your research easier and more effective, and how to generate a patient-led research culture at your trust.

The Wellcome Trust also provides guidance for involving patients in research and you can find further assistance on the Medical Research Council website.

Recruiting patients into studies

The NIHR Clinical Research Network Portfolio helps you to recruit patients into other people's studies and can help with a recruitment strategy. You can also find a range of blogs on the issue that provide advice, or an ebook from Forte Research.

The UK Clinical Trials Gateway provides access to a large range of information about clinical research trials that are running in the UK. It is designed to enable patients and doctors to locate and contact trials that are of interest to them.

Developing a research question

Research proposals must have a clearly defined research question. Important points to consider when you are developing a research question include the following.

- How important is the question? Why is the research needed? How will it add value to what we already know and for whom?
- Why does the research need to be done now?
- Who is interested in the answer? Target your research questions to ensure that research questions are in the remit of the particular funding stream and are answering the specific details of a call for research.
- Is there a viable solution to the problem and if it is shown to work, is it likely that the NHS will take it up?
- Has it been done before? (A literature review will enable you to establish gaps in the literature and will reveal institutions that are already working in your area of interest.)
- What is the potential scientific, social and economic impact of your research?
- What is the benefit to patients? It is important to demonstrate maximum benefits to patients. See the James Lind Alliance database to find out whether any work has been done to map the research questions that patients consider to be a priority in your area of interest. How will your research translate into policy and have an impact on healthcare in practice?
- Is it cost-effective? Value for money is paramount in the research world – demonstrate how your research will have an impact and add value.
- What study design will you use?
- How will you involve patients and the public in your research? The NIHR Research Design Service's patient and public involvement handbook provides useful information about how to involve patients and the public in research. INVOLVE is also a great source of information, as they offer briefing notes on how researchers can involve patients and the public in their research.

'Despite the challenges, I have found it immensely satisfying to pursue my own research questions and to use new skills.'

Tamsin Newlove-Delgado, doctoral research fellow and specialty registrar in public health

- How much time and resource is needed to complete the research in the time period?
- Do you have the right team to deliver the research?
- Does it align with your long-term career goals?

Developing a research proposal

What is a research proposal?

A research proposal is a detailed plan that outlines your proposed research project, supported by evidence from the literature and results from pilot studies. A research proposal is written to convince others that you have a good research idea, that you have a good understanding of the relevant literature, that you are competent to conduct the research and that you have the appropriate methodology and resources to complete the research. It should address *what* you plan to achieve, *why* you want to conduct the research and *how* you are going to do it and disseminate your findings.

How to write a research proposal

There are many different reasons for writing a research proposal, including applying for research funding, gaining permissions (such as ethics approval), or as part of an application for a PhD programme or fellowship. The type of proposal that you write will change accordingly and will depend on the type of research study that you plan to undertake.

In general, a research proposal should have sufficient information to convince the reader that you have an important research idea; make sure the aim of your research is clearly stated at the beginning of your proposal, and present a clearly defined research question.

You need to demonstrate that you are able to deliver the research by presenting a comprehensive and feasible research plan, describing every methodological step, the resources required, the cost implications, consideration of ethics and funding, and realistic timescales. Importantly, you need to anticipate any potential problems and state how you would deal with them. A project management plan is also important to ensure that your research runs as smoothly as possible.

The quality of your research design will be assessed: you need to convince the reader that your methodological approach is appropriate and high-quality, and that it will achieve results. The quality of your written proposal will also be assessed, so make sure you write it so that a lay member of a panel can understand it: be clear and concise, and remember to spell check!

Support for writing a research proposal

Start by seeking advice from your supervisor and senior researchers who have submitted successful applications in your area of interest. If you are looking for support or guidance around getting involved in research, the RCP mentoring scheme gives you the opportunity to be paired up with a trained mentor whose expertise is tailored to your needs, which is particularly useful if you are just starting research. The Academy of Medical Sciences also offers a mentoring programme that may be of interest for established academics.

Check what local guidance is available: individual hospitals and universities often produce their own guidance on writing research proposals and your hospital's R&D department will be able to provide assistance.

The NIHR Research Design Service provides expert advice on all aspects of writing a research proposal. If you are proposing a clinical trial, you are strongly advised to consult your local Clinical Trials Unit for help to develop your proposal.

It is crucial that your research proposal will 'work' in the NHS environment. The NIHR Clinical Research Network provides free, confidential advice on the feasibility of research proposals and it advises that you contact them as early as possible. Many funders' application forms now ask for evidence or confirmation that the NIHR Clinical Research Network has been consulted. Researchers who receive funding from these organisations are automatically eligible for consideration of Clinical Research Network support for study delivery.

Vitae, a website that provides resources and support for researchers, has produced a useful online guide to writing a research proposal. A simple Google search will also reveal many individually produced guides to writing research proposals and example proposals for your review. For example, 'How to write a research proposal' or the 'Proposal writer's guide' are written for researchers who have little or no experience of writing research proposals, and 'The art of grantsmanship' provides a useful timeline for planning writing your research proposal and addressing common pitfalls. Your R&D department can also be a good place to ask for help with grant writing or they can recommend a researcher who you can talk to within the trust who has successfully secured a grant in the past.

Applying for funding

Funding is available for all research, from research training fellowships to PhD bursaries and senior clinical research posts. Applying for funding can be confusing because there are many different types of funding available and a plethora of different funding bodies that all have different eligibility criteria, application processes and deadlines. However, there are comprehensive guides and support available to help you through every step of the funding application process. The important thing to realise is that this all takes time. The process may take several months, so it is a good idea to get advice about how long it might take to secure funding.

Another thing to think about when you are starting out is whether there are ways to carry out your project without having to apply for new funding. Sometimes, if you find the right research team to become involved with, you may be able to utilise existing resources by carrying out your project as an additional activity within an existing research project.

Funding opportunities

Specific funding opportunities are always changing, so it is best to watch out for announcements from all the major funders. Some of the main funders are listed below.

Government funding

The UK government provides funding for health research projects, mostly through the NIHR.

Research councils

> Medical Research Council
> Biotechnology and Biological Sciences Research Council
> Innovate UK

Research charities

> The Royal Society
> The Wellcome Trust
> The Academy of Medical Sciences
> Association of Medical Research Charities
> The Medical Research Foundation
> The BMA

Specialty-specific charities

> British Heart Foundation
> Cancer Research UK
> Diabetes UK
> Arthritis Research UK
> Alzheimer's Research UK
> Age UK
> Stroke Association

Think tanks

> The Health Foundation
> The King's Fund
> The Nuffield Trust

Royal colleges and specialty societies

Royal colleges and specialty societies often offer prizes, grants, fellowships, travel grants and funding to attend conferences. For example, the RCP offers several awards as part of its commitment to improve clinical standards and to support clinicians in a variety of specialty areas:

> Dame Sheila Sherlock fellowship in hepatology
> Thomas Watts Eden paediatric fellowship
> Graham Bull prize and Goulstonian lecture
> James Maxwell Grant Prophit fellowship
> John Glyn bursaries in rheumatology
> Samuel Leonard Simpson fellowships in endocrinology
> Linacre lecture
> Lady Estelle Wolfson lecture in translational medicine
> Lewis Thomas Gibbon Jenkins of Briton Ferry fellowship.

For information about funding opportunities, refer to the websites of the professional societies that are related to your specialty or area of research focus.

The European Union

Your original medical school

Industry, including pharmaceutical companies and private healthcare companies

Local hospital R&D departments/laboratories/ universities

Circumstances are different for each organisation in terms of funding for research. Your R&D department will know more about bequests, capacity funding or donations that might be available to you.

Guidance for applying for research funding

The National Cancer Research Institute has produced an easy-to-navigate pictorial guide to research funding opportunities for surgeons. Many of the funding schemes are open to applications from all specialties and for research areas other than cancer.

The Research Professional database shows funding that is available – you can sign up for a free trial or your R&D department might have a subscription. The NIHR also outlines current funding opportunities on its website.

Writing a successful funding application

Applications for funding differ according to the funding body you apply to. Most funding processes involve submission of an electronic application form, following which you may be invited to interview in front of a funding panel.

Tips for writing a funding application

- **Allow yourself time.**
- **Read the guidelines before you begin.**
- **Keep it simple and focused.**
- **Present a high-quality study design and evidence that you can deliver it.**
- **Tailor the application to the funding panel you are applying to.**
- **Discuss your application with colleagues before submitting it.**
- **Provide and justify detailed costings.**

Leave plenty of time to complete the application

Start your application early, as it is likely to take much longer than you anticipate to complete it. The application form is often lengthy and you may require input from several colleagues to complete all of the sections.

Read the guidelines carefully before you begin

The guidance notes that accompany the application form are designed to help you complete it and are well worth a read. Establish what needs to be submitted and when. Some funders ask for hard-copy as well as electronic applications, to arrive by the same submission deadline. Some funders ask for a one-page summary of the research proposal to be submitted ahead of your application. Make sure you are reading the latest version of their guidance and read the instructions carefully.

The Medical Research Council has a short video that provides application and process tips, and its application guidance is listed here.

Note: Funders can be very strict about proposal submissions and if you do anything that differs from their guidance it may affect your chance of being funded. Each funder has slightly different requirements, so it is always best to check the specific funder's guidance, even if you have read others.

Research your funding sources

Speak to your supervisors who have made successful applications, to discuss which funding opportunities would be most appropriate for you to apply for. Your organisation may already have established relationships with certain funding bodies.

Many grants are specialty and topic specific, so read all online guidance carefully to understand what can and cannot be funded before embarking on an application.

Write a clear, focused research question

Research proposals must be focused and succinct, with a clearly defined research question. Make sure you target your research question to match the interests and strategic priorities of the funding panel that you are applying to. Refer to the guidance in the 'Developing a research question' section above.

Present a high-quality study design

Research funders are looking for the highest standards, and the quality of your research design will be assessed. You need to demonstrate that you are able to deliver the research. Think carefully about the time and resources that you will need to complete the research successfully. Your R&D department can help with this, as they will understand the capacity and capability of your organisation.

Ask a colleague to read your application

Ask your supervisor and colleagues to comment on your application, and be prepared to make changes. It is also helpful to read colleagues' previously successful submissions. Your R&D department may also have the capacity to review your application.

Keep it clear and simple

The key to a successful research proposal is to communicate your message in the clearest way possible in the available space. Remember that the panel is likely to contain lay members and researchers who are not experts in your area, so your proposal needs to be accessible to a range of audiences.

Do not be disheartened if your application is not successful

If you have no experience of writing funding applications, do not expect to get everything right first time. If you do not get funding straightaway, discuss your application with your supervisor and try again. You will get feedback that will help you in your next application.

Support for writing funding applications

Lots of support is available for all stages of funding applications, from writing and submitting your application through to advice for funding panel interviews. Please see the 'Support for writing a research proposal' section above.

Tips for applying for a research fellowship

If you are applying for a fellowship, be enthusiastic. The panel are investing in you to be a future leader in the research world, so demonstrate to them how you will apply the skills that you develop through the fellowship to your future career in research, as well as showing your skills and commitment.

Applying for ethics approval

Ethics approval is a legal requirement and it cannot be applied for retrospectively; however not every piece of research requires ethics approval. To find out whether you need to get ethics approval, you can visit the NHS research ethics committee tool and fill in a short questionnaire.

It is important to provide information about ethics approval in all research publications. It is mandatory to complete Good Clinical Practice training if you are undertaking clinical research. The Clinical Research Network now provides training for Good Clinical Practice, which is completed by around 30,000 people a year.[10]

When to apply for ethics approval

You can apply for the approvals that you need simultaneously; however there are preparations to be made before doing so. The Health Research Authority (HRA) provides guidance on what you need to do before applying for ethics approval.

Applying for regulatory approvals to undertake research in the NHS in England

Regulation provides assurances that research is ethical, safe and of high quality. Any health-related research that involves humans, their tissue or their genetic material and/or data must be reviewed by the appropriate regulatory bodies before you can start. The Health Research Authority (HRA) provides guidance on which approvals you need, and how to apply for them.

Many grant-funded studies are eligible for support from the NIHR Clinical Research Network.

HRA Approval

HRA Approval (which is managed by the Health Research Authority (HRA)) is the mechanism for research to be approved for the NHS in England. It gives assurance to NHS organisations in England, to patients and to the public, that research meets the necessary legal and compliance standards. HRA Approval was introduced in March 2016 to bring together the assessment of governance and legal compliance with the independent NHS research ethics committee opinion that is provided through the UK health departments' Research Ethics Service.

HRA Approval replaces the need for local checks by each participating organisation of legal compliance and related matters. This allows organisations to focus their resources on assessing, arranging and confirming their capacity and capability to deliver the research study.

If your study will be led from England and will involve the NHS, you will need to apply for HRA Approval. Research studies that have sites in Northern Ireland, Scotland or Wales will be supported through existing UK-wide compatibility systems. If you have sites in Northern Ireland, Scotland or Wales but your study is being led from England, the HRA will share information with the relevant devolved administration.

When to apply for HRA Approval

You can apply for the other approvals that you need (eg Clinical Trial Authorisation) in parallel, and HRA Approval will be issued once all the other relevant approvals are in place.

You should ensure that you have developed and planned your study so that it is ready to begin in the NHS before you apply for HRA Approval. An application for HRA Approval includes, where applicable, the application to an NHS research ethics committee.

The HRA website provides guidance on which review bodies you will need to apply to for approval.

How to apply for HRA Approval

You can apply for HRA Approval by electronically submitting an Integrated Research Application System (IRAS) application form (called the 'IRAS Form') and your supporting documents to the HRA. To find out more about this process, see the IRAS guidance on HRA Approval.

Tips for applying for HRA Approval

- Get in contact with your university or hospital R&D team before you start the application process. They will be happy to provide guidance and to review your application before you submit it, to check that everything has been completed correctly, and to authorise and sponsor the application.
- Start early: it can take time to complete the IRAS form and to go through the process.
- Every research project presents different ethical and legal issues that need to be considered. Key principles to consider in any HRA Approval application include:
  - the practical logistics of running your study (including funding)
  - informed consent
  - the right to withdraw
  - confidentiality
  - data protection
  - safety – risks/harm reduction for both participants and researchers
  - what will you do if something goes wrong or if you discover an unexpected result?
- Write a clear, concise research protocol in language that a lay member of an ethics committee can understand.
- Attend the research ethics committee meeting and be prepared to answer questions to provide further information about your study. Respond promptly to queries from the HRA about your application.

Useful resources

A wide variety of training is available for researchers who are undertaking different types of studies. If you are undertaking clinical studies, the NIHR Clinical Research Network provides free Good Clinical Practice training, which prepares researchers to meet the ethical and practical standards to which clinical trials should be conducted.

The role of your R&D department and how it can help you

It is important that you consult your R&D department while you are setting up your research, as they are able to advise on local capacity and capability and to support the delivery of your research project once it is up and running. Some of the other ways that they can help you include:

- supporting the development and delivery of research projects within the trust
- ensuring local capability and capacity
- managing the grant and reporting on expenditure
- providing local expertise and guidance on research strengths and weaknesses within the trust
- providing information about what research is taking place
- providing performance management
- promoting the research culture
- reporting to and advising the hospital's board.

You can find more information about the role of the R&D department via the NHS Research and Development Forum and the R&D Functions Wheel.

Support for research delivery

The NIHR has many services that provide support and advice to researchers for study delivery, from helping to set up clinical studies quickly, to helping to ensure that the trials progress, and providing support for translating the results into clinical practice. The Study Support Service illustrates all the ways that the NIHR can help.

'There are plenty of hurdles to overcome – finding the time to complete the work is always the biggest challenge and there are always exams and work commitments that get in the way. Other challenges include accessing accurate and complete data and IT problems; I am yet to be involved in a project where this was not the case! But to some extent, these challenges can be mitigated by careful planning, and although research is often time-consuming, rarely goes to plan and involves a great deal of flexibility, it is enormously enjoyable!'

Sonia Szamocki, foundation year 2 doctor working in ophthalmology

Your local NIHR Clinical Research Network can help with many aspects of study delivery, by:

- providing research training for healthcare professionals
- providing funding for workforce, resources and study delivery costs
- providing skilled research support staff who can help to identify and gain consent from patients who are eligible for trials, and monitor patients as they progress through the study
- providing support for applying for permission to run a clinical study in the NHS
- helping to secure protected time for NHS staff to conduct research.

See the full offer that the NIHR Clinical Research Network makes to researchers and find out whether your study is eligible for NIHR Clinical Research Network support.

Researchers who are running clinical trials are encouraged to engage with a UKCRC Registered Clinical Trials Unit (CTU) early in the process, for help to design and run high-quality trials. The CTUs bring together the different experts who are needed to undertake a clinical trial, including clinicians, statisticians and trial managers. They offer expertise and advice, and they participate throughout the research process, from initial development of research ideas and preparing funding applications, to project delivery and publishing the results.

Your research might not always be eligible for Clinical Research Network support (for example, when conducting audit or quality improvement), but you can also access support from your local R&D department for these types of research.

Research skills development and training

'My involvement in research has opened many doors. One of the major advantages has been the additional skills that I've gained as a doctor. In particular, it has improved my teaching and learning skills, and my analytical and writing abilities have also benefited.'

Jamie Read, ACF in medical education / geriatric ST2

There are no specific skill requirements for getting involved in medical research. Your research group and supervisor will support you to develop the necessary competencies to deliver high-quality research through your research projects.

There are also lots of opportunities to seek further training in research skills. Many universities, royal colleges, specialty societies and research bodies offer research skills courses, training and further degrees in research methodologies. These range from broad introductions to courses in specific skills, methodologies or research areas. They are delivered in a variety of modalities, including 1-day training sessions, week-long courses, online learning modules and further degrees such as postgraduate certificates (PG Certs), diplomas or PhDs.

Specific training courses are always changing, so it is best to keep an eye out for opportunities in your area of interest. We have listed a few courses below, to demonstrate the wide range that are available. A simple Google search will reveal many more national courses, and you can speak to your supervisor to find out what is on offer locally.

Introductory courses on research

- Many universities offer courses on starting out in research.
- The Academy of Medical Sciences hosts 'Developing a career in research' events.

Courses for active researchers

- The NIHR Clinical Research Network provides training in good clinical practice, information governance and informed consent to healthcare professionals who are engaged in research.
- The Wellcome Trust offers a variety of courses, conferences, workshops and summer schools to develop specialist research skills.

Courses for advanced researchers

- The University of Oxford and Vitae, among others, conduct courses for advanced researchers in a wide range of topics, from managing your relationship with your supervisor to human genome analysis.
- The Academy of Medical Sciences' skills workshops for postdoctoral researchers are an opportunity to develop practical skills that are essential for successful research careers and will help you to bridge the gap between research training and an independent research career.

Training in research methods

- The NIHR Research Methods Programme offers support for developing expertise in research methods, including statistics, clinical trials, health economics, operational research and modelling.
- The NIHR funds master's studentships in economics of health and medical statistics.
- The University of Sheffield offers a 3-week residential introduction to laboratory research, and the University of Warwick's 2-week laboratory skills intensive course provides the opportunity to learn vital and fundamental laboratory skills in biomedical science.
- The National Guideline Centre runs courses on critical appraisal and systematic reviews and meta-analysis in action.
- The library at your local hospital or university will provide training in literature searching and conducting systematic reviews.

Training in specific research areas

- Research training is available in different topic areas. For example, the University of Manchester offers a course on health informatics and Imperial College London offers courses on translational research skills and biomedical research.

Other resources

- The Royal Society of Medicine's 'Resource of the month' feature is compiled by experienced library staff. It highlights online resources that many doctors may find interesting and that they can use to support their research.
- Attending conferences is another great way to support your further professional development and to gain new skills as a researcher, as well as to make contacts in the specialty that interests you. Most conferences have special rates for trainees, and some even offer free places or grants for students.

Mentoring and supervision

A career in research is rewarding and fulfilling; however, at times it can be challenging, so it is important that you have a good supervisor and academic mentor. Mentors can:

- act as a sounding board for ideas
- provide support, encouragement and constructive challenge
- signpost to relevant information and resources
- provide guidance, eg with funding and ethics applications
- provide careers advice.

The Academy of Medical Sciences coordinates a highly regarded mentoring programme for academic trainees. It also provides mentoring resources and information about starting a mentoring scheme at your local institution. Also, many universities have an academic mentoring scheme. Enquire locally for further information.

Getting your research published

'Don't be deterred by repeated rejections from journals and grant awarding bodies. Console yourself by remembering that major scientific breakthroughs were invariably brought about by determined individuals who would not be put off by the conventional wisdom of the day.'

Charles Ferro, NIHR fellow, consultant nephrologist and honorary reader in renal medicine

Getting your research published is important to disseminate the findings of your research and to promote translation into clinical practice. It is also an important step in your career and it can help your future funding applications. How you write and what you present will depend on the type of research and the journal that you are approaching. Start by speaking to your supervisors, who will have experience of publishing in your area of research and will be able to help you to get started.

Your NIHR Clinical Research Network can provide guidance on writing up your research, getting published and disseminating the results.

BMJ Learning offers an online module on how to write a research paper and get it published. It includes background information on how journal editors assess research papers, advice on how to avoid the common mistakes that researchers make when structuring their article, how to sell your paper to a journal editor and how to respond to rejection.

The Equator Network website provides a useful list of resources to help you to produce high-quality research publications, including advice for writing up your research, recommendations about where to publish and tips on how to get published.

The Guardian also published an interesting article that consults editors from top academic journals and collates 17 'top tips' about how to get published in an academic journal.

Presenting your research

Presenting your work at conferences and events is another important way of sharing your research and inviting critique and challenge from, and constructive conversation with, leading academics. Many different academic conferences are held locally, regionally, nationally and internationally across all specialties and research areas, all year round. There are a variety of ways that you can present at a conference or event, including giving a poster presentation, speaking in a seminar, facilitating a workshop or giving the keynote lecture.

Do not be put off if you don't feel that you have enough research experience to give a presentation – academics love to support new researchers and to help you develop your ideas, and they will help with the presentation. You may feel more comfortable starting off by presenting a poster, which gives you the opportunity to present your work and answer questions in a smaller, chaired poster session and to experience what a conference is like, to build the confidence that you would need to give an oral presentation at a later date.

To hear about upcoming conferences, events and opportunities to present:

- speak to your supervisor and mentor (who will not only advise you about which conferences to apply to, but will also be able to help you to write abstracts)
- keep an eye out for adverts in research journals
- sign up to the mailing lists and Twitter accounts of the main research bodies and specialty societies in your area of research interest.

How to create a research culture in your trust

'Setting up a research programme at yet another hospital was a massive undertaking. Thankfully, I have very supportive renal colleagues, as well as cardiology colleagues who had an interest in kidney disease. From humble beginnings with a single British Heart Foundation (BHF) project grant and a research fellow, we have now built up this group to be internationally recognised and attract millions of pounds of competitive research funding.'

Charles Ferro, NIHR fellow, consultant nephrologist and honorary reader in renal medicine

There is evidence that research-active organisations provide better outcomes for their patients, by offering patients early access to effective new treatments and by creating a culture that leads to improved care.[4] Engaging in research can generate income for your trust, which can support further innovations and patient care activities. Research-active trusts find it easier to attract leading doctors and establish a positive reputation. There is also evidence that clinical research is important to patients and the public. A survey conducted on behalf of the NIHR Clinical Research Network shows that 95% of people say it is important to them that the NHS carries out clinical research.[11]

The good news is that, as of 2016, all trusts are research active! However, work still needs to be done to make each trust more active – each person can make a real difference in their organisation.

Case study examples

For a research and innovation culture to flourish, it must be actively cultivated by creating space for and supporting it, by providing opportunities for its implementation, and by providing staff education and encouraging them to engage with it. Many exemplar organisations have implemented a research and innovation strategy to tackle real and perceived barriers to clinical research and have successfully embedded research into their core business. The examples highlight the factors that contributed to success and the impact that it has on the trust, in terms of both research performance and patient outcomes.

The RCP Future Hospital report[12] recognised the importance of developing a strong research culture in trusts, to increase research activity and performance. Tees, Esk and Wear Valleys NHS Foundation Trust, winners of the *Health Service Journal* (HSJ) 2011 research culture award, are one such example.

The NIHR Clinical Research Network is keen to identify and share good research practice and to recognise those trusts and clinical commissioning groups (CCGs) that are already making great strides in developing the research capability within their organisation. To this end, the NIHR Clinical Research Network established the HSJ Clinical Research Impact Award, a jointly sponsored award with the HSJ for organisations that demonstrated a step change in research culture.

Tips to help you support your trust to become more research active

What can you do to expand the research culture in your organisation? The RCP chief registrar programme can give you some ideas about embedding an ethos of quality improvement, and you can speak to your R&D department about becoming a research champion among your colleagues and helping others with their research.

Useful links

Visit the following websites for further information about medical research.

- The RCP Research and Academic Medicine Committee
- The NIHR
- The NIHR Clinical Research Network
- The Academy of Medical Sciences
- The Medical Research Council
- The Association of Medical Research Charities
- The UK Clinical Research Collaboration
- The Wellcome Trust
- NHS Health Careers
- Academic Health Science Networks

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