



Clinician Scientist Fellows Scheme Evaluation

January 2013

The Academy of Medical Sciences

The Academy of Medical Sciences is the independent body in the UK representing the diversity of medical science. Our mission is to promote medical science and its translation into benefits for society. The Academy's elected Fellows are the United Kingdom's leading medical scientists from hospitals, academia, industry and the public service. We work with them to promote excellence, influence policy to improve health and wealth, nurture the next generation of medical researchers, link academia, industry and the NHS, seize international opportunities and encourage dialogue about the medical sciences.

Foreword by Professor Sir John Tooke PMedSci

It is with great pleasure that I present the findings of this independent evaluation of the Academy's and The Health Foundation's Clinician Scientist Fellowship scheme. When we launched the scheme in 2001 it was hoped that these individuals would cultivate important research programmes, create and lead research teams and become the next generation of clinical academic leaders. This evaluation indicates that the CSF scheme is meeting these aims and contributing towards achieving the strategic objectives of the Academy and The Health Foundation. Inspiring and supporting the next generation of medical scientists along their career pathway is one of our most important goals, and this report will give us the evidence to guide us as we consider how best to continue supporting the careers of clinical academic researchers in the future.

Strengthening clinical academic medicine has always been a core priority for the Academy. Academic clinical practice translates scientific discoveries into patient care, but the quality of the science and its translation are only as good as the people involved. After the Academy's establishment in 1998, our first piece of work set out to address the decrease in the numbers of young medical doctors pursuing a dual career in clinical service and medical research. The Academy's work in this arena culminated in the publication of the report '*The Tenure-Track Clinician Scientist: a new career pathway to promote recruitment into academic medicine*' in 2000. The report made a number of recommendations to address disincentives to pursuing a clinical academic career, most significantly the creation of a competitively entered Clinician Scientist Fellowship (CSF) scheme, to provide doctors who have a PhD/MD with protected time to undertake post-doctoral research. It is these individuals, with both their first hand experience of current medical practice and knowledge of the latest research, who can ensure the translation of the UK's strengths in clinical and biomedical research into improved healthcare for wider society.

Following on from this pivotal report, in April 2001 the Academy partnered with The Health Foundation to launch a CSF scheme to enable cohorts of individuals to develop their research programmes and careers whilst completing their clinical specialty training and to assist them to become independent researchers. Whilst the scheme was responsive, applications from clinical academics working in vulnerable clinical academic specialties such as academic surgery, radiology and paediatrics were encouraged. Each fellowship offered the clinician financial support to cover salary and research expenses as well as personal and professional development opportunities. It was hoped that these individuals would cultivate important research programmes, create and lead research teams and become the next generation of clinical academic leaders.

An evaluation of an early phase of the programme in 2005¹ showed that the fellowships were helping participants attract other organisations to invest in clinical academic medicine. At this point, 13 fellows had been awarded funding, and the scheme had brought in over £4.2 million in additional research funding. Both the fellows and their senior colleagues reported that the programme was providing them with the opportunity to become leaders in their field. In 2011, after 21 awards over three cohorts and more than a decade on, it seemed timely to pause and

¹The Health Foundation (2005) '*Evaluation of the Clinician Scientist Fellowship scheme*'.
<http://www.academicmedicine.ac.uk/uploads/Health%20Foundation%20evaluation%20of%20CSS.pdf> .

reassess the impact of the scheme and to consider our ongoing strategies for the provision of career development support to clinical academic researchers.

I believe that this independent evaluation shows how important this fellowship programme has been in nurturing a cadre of research-led clinical academics capable of leading development in their discipline and strongly supports its continuation. The report demonstrates that the CSF scheme is meeting its objectives and contributing towards achieving the strategic objectives of The Health Foundation and the Academy. CSF fellows are being enabled to advance knowledge and establish themselves as a leader in their field, with 297 significant publications and 37 prestigious prizes reported across all cohorts. It is also building research capacity and CSF fellows have leveraged over £50 million in additional research funding across all cohorts, which is a return of £4.45 for each £1 invested in the scheme. CSF fellows are also forming important collaborations, at the inter-disciplinary level, and between industry and the NHS. The evaluation has also found evidence that the quality and performance of healthcare is improving as a result of the fellows' research, with research being translated into clinical practice and healthcare policy at local, national and international scales. This has been manifest through the optimisation of clinical protocols and guidelines, the successful filing of patents, and the development of new clinical trials, devices and technologies.

The CSF fellows and high-level stakeholders that were interviewed hold the scheme in high regard and identified a number of key strengths that they believe have led to the scheme's success, such as its tailored and flexible approach, the focus on specialities which do not have a big charity-funding base, and the complementary partnership between the Academy and The Health Foundation. However, we were also told about some parts of the scheme that could be changed next time, if we were to run the scheme again, such as the need to consider providing funding for research assistance to help fellows to balance their time between research and clinical practice, and the need for further support for CSF fellows at the end of the award to aid their transition to senior positions.

The focus of the scheme has evolved over time, as the Academy and The Health Foundation have developed and grown. But we continue to have a shared aspiration to advance clinical research and improve healthcare. By working in partnership, we have been able to provide prestigious, targeted, awards utilising the skills and expertise within each of our organisations. CSF fellows have been supported by the knowledge and commitment of the Academy's highly respected Fellowship and broad-based networks in academia, industry, the charities, parliament, and public service. The awardees have also had the opportunity to participate in the Academy's highly successful Mentoring and Outreach programme. In addition, the CSF fellows have benefited from The Health Foundation's expertise in leadership training and strategies to define and deliver better health and healthcare outcomes.

Since its inception, this prestigious scheme has been established across a number of funders, medical research charities and pharmaceutical companies, such as the Wellcome Trust, Medical Research Council and Cancer Research UK. There have also been significant developments in the wider education and training context, and funders have developed a number of initiatives aimed at revitalising the clinical academic workforce, including the National Institute for Health Research Integrated Academic Training Pathway, which provides a clear training pathway for those wishing to pursue this career. The impact of these changes has been significant, but

challenges remain and it is crucial that the new education and training architecture is taken as an opportunity to create a research-aware workforce that encourages and rewards academic excellence. As such, developing the next generation of leading global medical researchers continues to be one of the Academy's key strategic goals.

This evaluation report shows clearly the value of this specific partnership with The Health Foundation, but it has also helped us understand in more detail the importance of this type of fellowship and should be of use to other organisations running these and similar schemes. The report will give us the evidence to guide us as we think about other ways of supporting the careers of clinical academic researchers. It will show us how we can best support the future leaders of the profession as they set up research programmes alongside their clinical practice. We want these academic clinicians to translate their research into clinical practice and wider healthcare policy for the benefit of patients, and I think this report gives us some ideas on how to make this happen.

**Clinician Scientist Fellows Scheme
Evaluation 2012**

Report

Prepared for the Academy of Medical Sciences

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1 Summary

The Academy of Medical Sciences and The Health Foundation have partnered to deliver three cohorts of the Clinician Scientists Fellowship scheme (hereafter the CSF scheme); which provides clinicians who have a PhD with protected time to undertake post-doctoral research. In total, 21 fellowships were awarded between 2002 and 2008. This evaluation aimed to:

- Assess the impact of the Academy/The Health Foundation CSF scheme; and
- Develop an evidence base to inform future design and investment in such schemes.

The evaluation used a combination of qualitative and quantitative methods to measure the impact of the scheme, including an online survey completed by 18 CSF fellows followed by telephone interviews with 17 of these fellows, and telephone interviews with 10 high-level stakeholders. The findings have been structured according to the aims of the scheme, and are examined in relation to the impacts on research, clinical and healthcare practice, and leadership and career progression.

Research impacts

The evaluation indicates that the CSF scheme is achieving its stated aim of enabling clinical academics to cultivate important research programmes alongside their clinical practice. It has:

- Enabled CSF fellows to meet their research objectives and advance knowledge in their chosen field. For example, across all cohorts fellows reported 297 publications in significant journals and 37 prestigious prizes that have been awarded as a result of their CSF or related research.
- Built research capacity through leveraging funding and research support to create and grow new research groups and develop related projects, with fellows reporting leveraging a total of £49.36M in additional funding, a return of £4.45 for each £1 invested in the scheme.
- Led to the formation of important inter-disciplinary collaborations, involving industry and the NHS, with 135 new research collaborations reported across the UK and internationally.
- Helped CSF fellows to establish themselves as a leader in their field and to encourage a culture of clinical academic research through teaching and supervisory activities.

The extent to which these impacts have been achieved appears to be influenced by the type of research, with more basic research taking longer to have impact, and by the length of time since the award was made, with fellows in earlier cohorts reporting the biggest impacts to date.

Clinical and healthcare impacts

The data indicate that the CSF scheme has had a positive impact on CSF fellows' own clinical practice and on healthcare practices and policy at local, national and international levels. The most significant of these are that it appears to have contributed to are:

- New or optimised local and national clinical protocols and guidelines. For example for radiotherapy treatment and the management of pancreatitis.
- New clinical trials to evaluate safety and efficacy of products developed during their CSF research, such as a national study to reduce transplant injury in renal transplantation.
- The development of new devices or technologies, such as a new technique for sentinel node biopsy, which has is being evaluated in the UK and the Netherlands.
- The successful filing of patents in the fields of neurosurgery, paediatric surgery and ophthalmic surgery.

Where there were less evident clinical or healthcare policy impacts, fellows and stakeholders felt it was important to recognise the different timescales that basic research may require to manifest impacts. High-level stakeholders emphasised the benefits that CSF schemes produce, such as increased research awareness and application in the NHS, by helping to build the reputation of the UK for research leadership, building NHS staff morale and encouraging evidence based changes in clinical practice.

Leadership and career impacts

The data indicates that the scheme has clearly helped to retain fellows within clinical academia, and all the fellows reported that the scheme had, or was having, a positive impact on their career, for example by:

- Furthering professional development by encouraging fellows' research ambitions, enhancing their confidence and facilitating access to key networks.
- Aiding fellows' career progression and encouraging promotion, for example through gaining senior fellowships and tenured appointments.
- Enabling fellows to become involved in collaborative research funding applications and to establish their own teams and influence the work of other researchers.
- Helping fellows to become perceived as an emerging leader in their field.

The prestigious nature of the award coupled with the support for leadership development were the most significant factors in influencing fellows' career and leadership progression.

Delivering impact

Fellows and stakeholders emphasised that a key benefit of the scheme is its personal and tailored approach, which allows fellows flexibility to pursue their research and individual career objectives. The key factors underlying this success of the scheme appear to be that it:

- Encourages clinicians to pursue academic research, when it is a less secure career path than mainstream medical practice, by supporting fellowships of sufficient duration to enable significant research outputs, particularly in niche or vulnerable specialties where research may not otherwise be supported.
- Uses Academy Fellows to peer review applications and progress reports, ensuring that talented candidates are selected to receive the award, high quality research objectives are pursued, and academic support is provided.
- Provides fellows with protected time to pursue their research in an environment where balancing clinical practice and research priorities is increasingly difficult.
- Allows fellows' flexibility in their use of the grant to develop and pursue existing and new projects, and, under certain circumstances, to extend the award.
- Enables fellows to develop a broad perspective and experience base in research, which enables them to bridge existing gaps between clinical practice and basic research.
- Provides fellows with opportunities to build their leadership skills, profile and professional networks, and to access a broad range of career support and guidance, such as mentorship.

Key reflections

Overall, CSF fellows and stakeholders hold the scheme in high regard, particularly for its tailored, personalised approach. Key strengths are identified as:

- The focus on specialties that do not have a big charity funding base ensures that clinical practice in these specialties benefits from high-quality research.
- The ability of the partners to complement each other. The Health Foundation offers leadership training aimed at stimulating novel and innovative practice and the Academy takes a leading role in the peer review process, the provision of a range of career support, such as mentorship, and facilitates profile building and networking with Fellows.

CSF fellows and stakeholders identified two key points for consideration with regard to future development of the scheme:

- Provision of funding for research assistants to help fellows to balance their time; and
- Further support for fellows at the end of the award to aid transition to more senior positions.

2 Introduction: the scheme and its aims

2.1 *Clinician Scientist Fellowship scheme*

Founded in 1998, the Academy of Medical Sciences is the independent body in the United Kingdom (UK) representing the diversity of medical science. The Academy's elected Fellows are the UK's leading medical scientists from hospitals, academia, industry and the public service. Its mission is to promote medical science and its translation into benefits for society.

The Health Foundation is an independent charity working to continuously improve the quality of healthcare in the UK. It carries out research and evaluation, runs a wide range of improvement programmes, supports leaders and spreads learning into healthcare policy and practice.

Soon after it was established, the Academy set out to address the decrease in the numbers of young medical doctors pursuing a dual career in clinical service and medical research. This work culminated in 2000 with the publication of a report, *'The Tenure-Track Clinician Scientist: a new career pathway to promote recruitment into academic medicine'*. A significant outcome of the report was the creation of Clinician Scientists Fellowships (CSFs), which provide clinicians who have a PhD with protected time to undertake post-doctoral research. CSFs have been established across a number of funders, medical research charities and pharmaceutical companies. The Academy has partnered with The Health Foundation since 2002 to award a number of CSFs. The aims of this particular CSF scheme (hereafter the CSF scheme) are:

- To enable clinical academics to cultivate important research programmes alongside their clinical practice.
- To encourage fellowship holders to maximise their research, through translation into clinical practice and wider healthcare policy.
- To nurture the next generation of clinical academic leaders capable of leading development in their discipline, by assisting them to become independent researchers and to create and lead research teams.

2.2 *Academy of Medical Sciences/The Health Foundation CSF awards*

The Academy and The Health Foundation have partnered to deliver three cohorts of the CSF scheme. The scheme was developed to be open and responsive, and applications have been especially encouraged from clinical academics working in vulnerable academic specialties, including surgery, radiology and paediatrics, or where people are working across disciplinary boundaries. It has supported 20 individuals in three rounds of awards:

- **Cohort 1** - 9 CSF fellowships were awarded in 2002-04. They were either three or five years' duration. One was renewed for a further five years and continues.
- **Cohort 2** – 6 CSF fellowships were awarded in 2006 for five years' duration. Four have either ended or are coming to an end and two have one year remaining.
- **Cohort 3** – 5 CSF fellowships were awarded in 2008 for five years' duration. All are active.

In total, £11,088,176 has been awarded across the three cohorts - an average of £554,409 per fellow - with award amounts ranging from £168,978 (Cohort 1) to £726,047 (Cohort 2). A breakdown is shown in Figure 2.1 below.

Figure 2.1: Amount of funding awarded to all CSF cohorts

Cohort	No. of fellows (individuals)	Amount awarded	Average per fellow
1	9	£4,224,256*	£469,362
2	6	£3,652,244	£608,707
3	5	£3,211,676	£642,335
All	20	£11,088,176	£554,409

Note: *Includes a renewal award for 1 fellow for 5 years.

This report uses the term ‘current’ to describe all fellows who are yet to finish their fellowships. This includes all five members of Cohort 3, three members of Cohort 2 and the member of Cohort 1 whose fellowship was renewed and continues. The term ‘completed’ refers to the eight fellows in Cohort 1 and three in Cohort 2 whose fellowships had ended prior to June 2012 when this evaluation commenced.

2.3 Evaluation aims

The Academy commissioned Jenesys Associates to conduct an evaluation of this CSF scheme in order to:

- Assess the impact of the Academy/The Health Foundation CSF scheme; and
- Develop an evidence base to inform future design and investment in such schemes.

In order to meet the aims of the evaluation, two objectives were pursued:

1. To gather quantitative data relating to the impacts of the scheme on the fellow’s field of research, clinical practice and healthcare policy, and the fellow’s career progression.
2. To gather qualitative information from the CSF fellows and stakeholders to enable a deeper understanding of how the scheme had achieved any identified impacts, and to highlight any challenges and how these might be addressed through amendments to the scheme or other means of support.

2.4 Evaluation methodology

An online survey was developed in liaison with the Academy staff to capture a wide array of potential impacts. The survey was based on indicators used in past evaluations and contained closed and open questions. It was piloted internally.

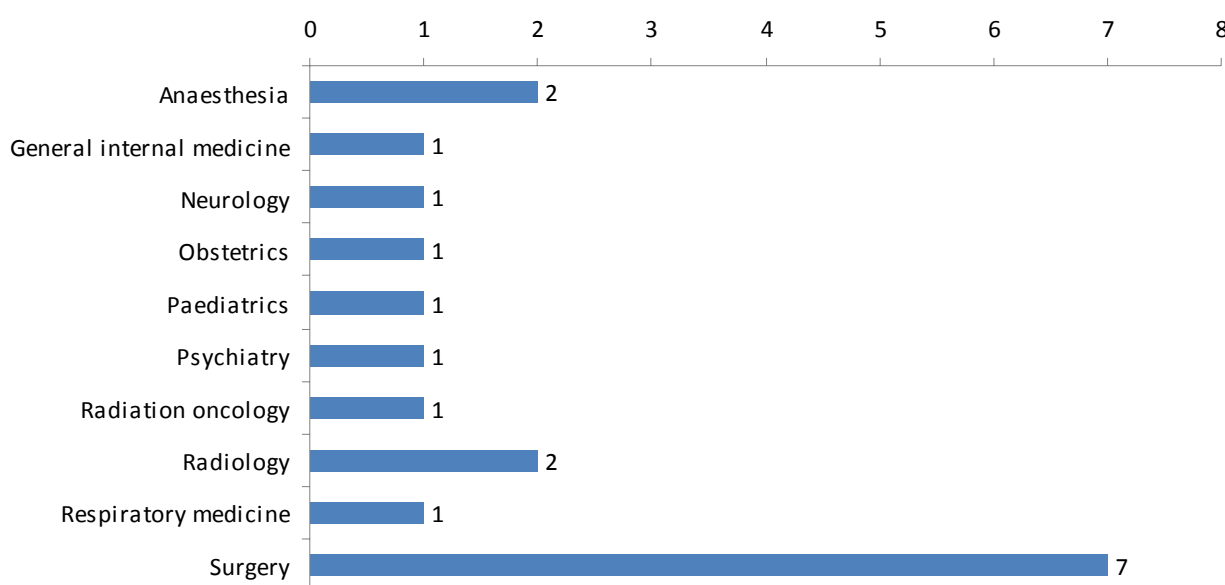
Topic guides for semi-structured interviews with fellows and stakeholders were also developed in liaison with Academy staff. The interviews with fellows sought to build on the findings of the survey and the stakeholder interviews were intended to explore the broader context for the scheme and wider impacts.

Data collection and sampling

The online survey ran from 13 June to 15 August 2012. It was designed and distributed using 'Snap Surveys' software. CSF fellows were initially invited by Academy staff to take part in the evaluation and were given the opportunity to opt out of the survey. No fellows opted out and their contact details were subsequently passed to Jenesys Associates by the Academy. Jenesys emailed each fellow a unique link to the survey, which they could re-enter until it was completed.

In total 18 fellows answered the survey (10 completed and 8 current fellows, 8 of Cohort 1, 5 of Cohort 2 and 5 of Cohort 3), representing a response rate of 90%. Survey respondents were not forced to answer all questions and whether or not they answered some questions was dependent on responses to earlier questions. Therefore sample sizes differ and the report shows the number of respondents (n=) for every question. As Figure 2.2 shows, the 18 fellows who completed the survey were spread across 10 different specialties.

Figure 2.2: Fellows' research specialties (n=18)



The 18 fellows who completed the survey were subsequently invited by personal email to take part in follow-up telephone interviews. 17 agreed to participate and the interviews took place between 25 June and 21 August 2012. The interviews were audio-recorded and transcribed.

All quantitative data were self-reported by the CSF fellows and Jenesys have not attempted to validate the data. As such, due care has been taken in the interpretation of the data, and the reported figures should be used as indicative only and taken alongside the qualitative findings.

Interviews with 10 high-level stakeholders, representing a wide range of research, clinical and policy interests, took place between 13 July and 24 August 2012. Stakeholders were invited by the President of the Academy to take part in the evaluation, and were subsequently contacted by Jenesys to schedule telephone interviews.

Data analysis

Quantitative survey data were collected using the survey distribution software. The data from the interviews and the answers to open survey questions were coded and analysed using 'NVivo' software and reviewed to identify interesting quotes and case study examples. Detailed notes were taken of the interviews with stakeholders, which were systematically reviewed to identify key themes and points.

Reporting

Data in this report have been anonymised. Quotes from fellows are attributed to the different cohorts e.g. (CSF fellow, Cohort 2). Quotes from stakeholders are attributed to named individuals.

Sections 3 to 5 of this report detail the main findings of the evaluation, and have been structured according to the overall aims of the scheme, examining the impacts on research, clinical practice and healthcare policy, and leadership and career progression separately. Section 6 presents the structure of the CSF scheme and examines the key underlying factors which fellows and stakeholders considered were important in delivering the identified impacts. Section 7 summarises the main findings and presents some reflections on the strengths of the scheme and considerations for future development. Short case studies featuring the fellows are used throughout to illustrate key themes and points of interest.

3 Research impacts

Aim: To enable clinical academics to cultivate important research programmes alongside their clinical practice.

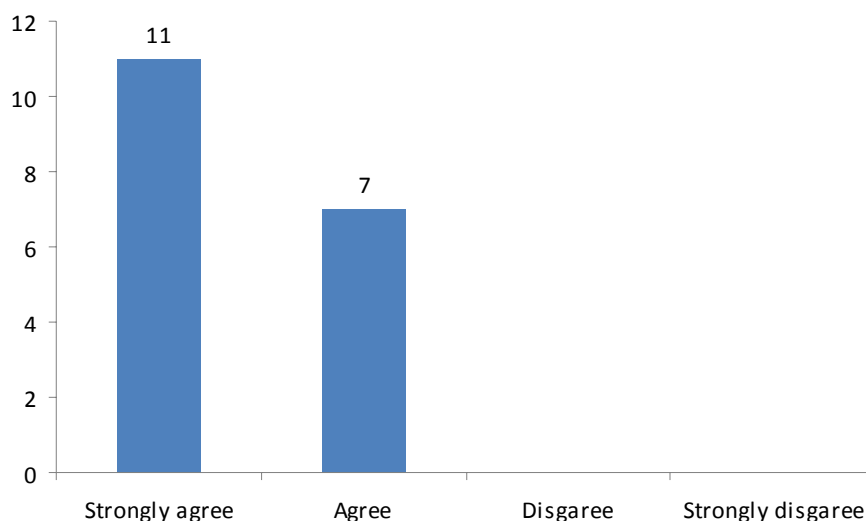
In order to address the decline in the number of clinical academics identified when the scheme began, a key aim has been to support clinical research. There are a number of aspects to achieving this aim, which are explored in this section of the report, including:

- Encouraging fellows to undertake important medical research.
- Enabling fellows to build knowledge in their discipline and to disseminate this knowledge, for example through peer reviewed publications, presentations and awards.
- Building research momentum, by increasing the capacity of departments and institutions, for example by leveraging funds and creating new research posts.
- Encouraging other clinicians to undertake academic research and/or to help to embed research in clinical practice.

3.1 Meeting research objectives

All fellows reported that they ‘strongly agree’ or ‘agree’ that the CSF scheme is enabling or has enabled them to meet their research objectives (see Figure 3.1), which can be taken as a proxy indication that fellows are successfully undertaking important research, since these objectives are peer-reviewed by Academy Fellows at the time of application for the award.

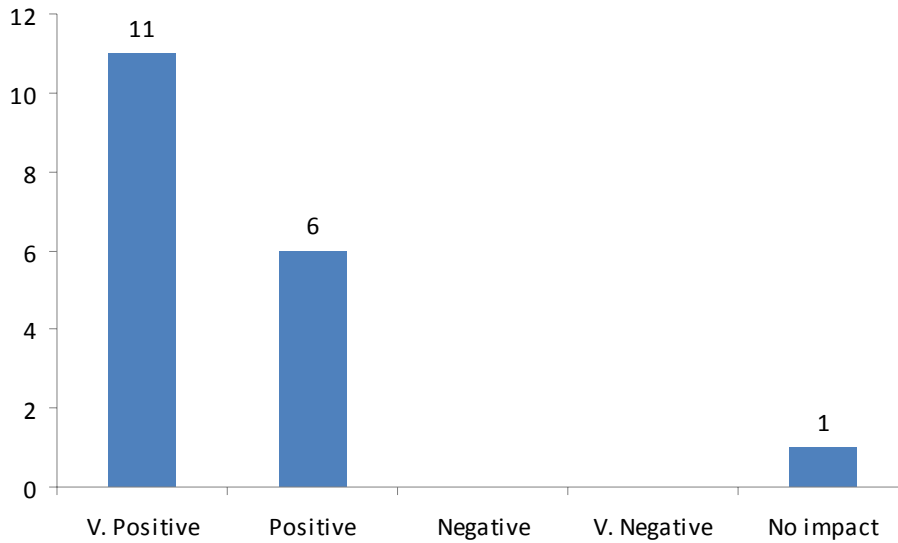
Figure 3.1: Extent to which the scheme enables fellows to meet their research objectives (n = 18)



In terms of building knowledge, with one exception, all fellows reported that that the CSF scheme has, or is having, ‘very positive’ or ‘positive’ impact on the knowledge base as Figure 3.2 shows. The one fellow who reported ‘no impact’ in the survey explained during interview that they felt it had not made an impact because they had not carried out a clinical trial as originally planned. However, they had developed their research in other areas and published widely in their field, implying that their research is contributing to the knowledge base:

“When I wrote the CSF research bid, it was going to be based around a clinical trial, but that didn’t happen at the planned time - it happened four years later. So although the research track we followed was related [to the CSF research] it was not directly the project that was initially planned. A lot of the things which happened since have been spin offs from this research, including papers I’ve had published” (CSF fellow, Cohort 2).

Figure 3.2: Scheme's impact on knowledge base (n=18)



3.2 CSF and related research

The survey asked fellows to report impacts from their CSF funded research and any related research, which was defined as research that has developed from the CSF research and is being, or has been, funded from other sources. For the quantitative metrics, such as publications, funding awards etc., a majority of Cohort 1 fellows reported combined figures for their CSF and related research due to difficulties in separating the two. The main explanations given for this were very close links between their CSF and related research and the length of time since their fellowships had been awarded, which made it difficult to recall exactly which impacts had come from specific awards. There was also a suggestion that some of these fellows were at a more advanced stage in their careers than later cohorts when their fellowships were awarded and that their CSF awards were part of a portfolio of different funding, all of which had contributed to the reported impacts. As a consequence, consolidated figures are reported for Cohort 1 for publications, presentations, number and value of grants and research posts etc.

3.3 Publications and presentations

In response to the survey, all fellows reported direct impacts in the form of publications and presentations from their CSF funded research and related research, suggesting that they are building knowledge in their disciplines, and disseminating this knowledge widely (see Figure 3.3 below). CSF fellows in Cohort 3 reported fewer publications than other cohorts, which is to be expected as their research is still ongoing. All of these fellows noted that they anticipated having further meaningful publications in the near future.

Figure 3.3: Academic publications and presentations attributed to CSF and related research (n = 18)

	Cohort 1 (n=8)	Cohort 2 (n=5)		Cohort 3 (n=5)		All cohorts (n=18)
	CSF & Related	CSF	Related	CSF	Related	
No. of academic papers in significant journals *	184	60	43	9	1	297
No. of UK conference presentations	117	28	25	39	9	218
No. of international conference presentations	126	18	15	30	4	193

Note: *Fellows were asked to report the number of academic papers in high impact journals. As such, the reported figures include the highest possible impact journals in niche specialties as well as journals which have lower impact factors but which fellows deem to be important because of the nature of their readership or particular focus.

Across all cohorts fellows reported 297 publications in journals that they regard to be the most significant in their particular fields as well as general medical journals. Some of these publications have occurred in the highest impact medical journals, such as the *Lancet* and the *Journal of the American Medical Association*, which are rated 38.278 and 30.026 (2011 Journal Citation Reports®, Thomson Reuters 2012). Others are in the highest impact journals in niche areas, which are important given the emphasis the CSF scheme places on vulnerable academic specialties. Examples include *Radiology* (impact factor 5.726), *British Journal of Anaesthesia* (4.243) and *Transplantation* (4.003). All fellows were able to cite publications in the highest impact journals within their own areas of research.

“My work has been published in the British Journal of Anaesthesia, which is the third highest ranking journal in my field. I am also published in JAMA (the Journal of the American Medical Association) which is one of the highest ranking of all medical journals” (CSF fellow, Cohort 3).

“There was a Lancet publication which is certainly the highest impact. I am also published in journals that rank highly in my field, such as Radiology” (CSF fellow, Cohort 1).

Academic stakeholders highlighted the significance of the duration of the fellowship, emphasising that five years were necessary to publish research in a significant journal with high impact.

“The duration [of the CSF award] is significant because it gives the fellow sufficient time to establish themselves - to develop into someone with an international reputation and to give them the time to publish in high impact journals” Professor Stephen Lawrie, Head of Department for a Cohort 2 CSF fellow.

“Having 5 years is important because it is very difficult to get good papers in three years. 5 years buys the space to get something in a big journal with high impact” Professor Mervyn Singer, Supervisor for a Cohort 3 CSF fellow.

All fellows reported conference presentations. These totalled 218 in the UK and 193 overseas. The fellows emphasised that they had been invited to make presentations at significant national and international conferences, and frequently attributed this to the prestigious nature of the CSF scheme.

“I have received many invitations to speak in the UK and overseas. There have been lots of opportunities for oral presentations and dissemination at some really quite prestigious meetings. There has been no trouble in getting my work accepted and the work has had a major impact in this way” (CSF fellow, Cohort 3).

Case Study – Presentations

Dr Jonathan Fallowfield, CSF in General Internal Medicine

The CSF award has enabled Dr Fallowfield to pursue his research into the haemodynamic and anti-fibrotic effects of targeted therapies in models of liver cirrhosis and portal hypertension. He has received invitations to present his work at prestigious international and UK conferences. Dr Fallowfield was also invited to speak at the first ever Fibrosis summit at the Cleveland Clinic in America and to teach on their post-graduate courses, which has been very important for his international reputation and broader awareness of his research. He said the impact was very beneficial in terms of getting him and his work noticed by significant people in his field.

“The most prestigious was being invited to give an oral presentation at the American Association for the Study of Liver Disease (AASLD) which is the premier international conference in my field. In the UK I have given two presentations at the Association of Physicians, which is very prestigious and an achievement because all the most influential people were present.”

3.4 Prizes and awards

Fourteen fellows across all cohorts reported a total of 37 prizes and awards, all of which were attributed directly to the fellows’ CSF research and not to related research. Figure 3.4 includes prizes for research, as well as awards for leadership and wider healthcare contributions, which are discussed in section 6 of this report. Most of those who reported prizes and awards had completed their fellowships.

Figure 3.4: Prizes and awards made to fellows (n = 18)

	Cohort 1 n=8	Cohort 2 n=5	Cohort 3 n=5	All cohorts n=18
No. of prizes or awards	25	9	3	37

In relation to awards and prizes that recognise research, fellows mentioned prizes for presentations and papers at national and international conferences. Examples of awards not related to specific papers or presentations include the Flude memorial prize awarded by the British Institute of Radiology for advancement of radiological science in the UK and a World Health Organisation (WHO) award in recognition of outstanding efforts in the research of tobacco control and tobacco industry strategies in Europe.

3.5 Building new research capacity

The extent to which the CSF scheme has enabled fellows to develop research capacity and activity within their speciality has been measured by the amount of funding leveraged, the creation of research posts and teams, whether the research has contributed to recognition of research excellence of their departments through formal assessment exercises, and the extent to which it has encouraged other clinicians to undertake academic research and/or helped to embed research in clinical practice.

3.5.1 Further funding

All fellows reported grants they had received from other funders and which they attributed to their CSF and related research. The reported amounts represent the funding that has been leveraged through CSF and related research by the fellowship awards but do not include the funding for the awards. Figure 3.5 shows that the £11,088,176 awarded to all fellows has leveraged £49.36M

funding from other sources, which represents a return on investment across all three cohorts of 4.45:1, meaning £4.45 of funding for each £1 invested in the scheme. The ratio is highest for the earlier cohorts, who have had longer to attract further funding.

Figure 3.5: Further funding attributed to CSF and related research (n = 18)

	Cohort 1 (n=8)	Cohort 2 (n=5)		Cohort 3 (n=5)		All cohorts (n=18)
	CSF & Related	CSF	Related	CSF	Related	
No. of grants obtained from other funders	87	20	20	16	4	147
Total value of grants obtained from other funders (£)	30.23M	6.89M	7.83M	4.13M	0.28M	49.36M
Return on investment ratio*	7.2:1	1.9:1	2.1:1	1.3:1	0.1:1	4.45

Note:

* Amount of leveraged funding divided by total amount of fellowship award

In interviews, all fellows said that a variety of sources had awarded the funding attributed to their CSF and related research. They named national and international funders, including research councils, e.g. Medical Research Council (MRC) and Science and Technology Facilities Council; charities, e.g. Wellcome Trust, Cancer Research UK; and European Union funding sources, such as EU Framework Programme 7 (EU FP7). Some fellows also named local funders, e.g. Guys' and St Thomas's Charity and Sheffield Charitable Trust. All fellows described different types of funding which complemented their CSF award including grants for equipment and infrastructure and funding to create new posts, such as grants for research assistants.

"We had a Wellcome Trust research grant which kicked in towards the end of the fellowship. Through the university, we had SRIF (Science Research Investment Fund) funding for development of imaging techniques locally. And then we've got some smaller local grants for research" (CSF fellow, Cohort 1).

"I have also gained additional grant support which is over ten times the original amount awarded ... for the CSF, which provides an excellent return on investment" (CSF fellow, Cohort 2).

Case Study – Further funding

Dr Jonathan Coles, CSF in Anaesthesia

Dr Coles' research interests are focused on describing the pathophysiology of head injury and optimising patient outcome. The fellowship enabled him to establish himself as a researcher who has since been involved in a number of larger grants to continue his research.

"I was a co-investigator on an MRC programme grant. There was also a Wellcome Trust project grant which I led and two research fellowships. One was for a PhD student and another was from the National Institute of Academic Anaesthesia. There is also a European Union Framework Programme 7 (EU FP7) grant where I'm a co-investigator."

The EU FP7 project involves an imaging group and a clinical group in Finland, an imaging collaboration with Imperial College London and support from GE Healthcare. Dr Coles says it has created a good foundation for future funding bids in the same area.

"There's been a recent EU call for a body of research across Europe looking at head injury and so our group with these collaborators and others is putting together a bid for this funding."

During interviews, most fellows mentioned the advantages in this regard of having received CSF funding, which they said is a prestigious award that is highly-regarded by other funders.

“Whilst nobody says you have to have a CSF, what it does show is that you are clearly good enough to have been funded by a scheme to begin with. It stands you in good stead as very often on an application there is a question about previous funding. The status of the CSF scheme and the size of award look good as answers” (CSF fellow, Cohort 3).

At the outset of the CSF scheme it was recognised that, to be regarded as successful, fellows would need to leverage additional funding in order to build upon their research outcomes and contribute to the reputation of their departments. All fellows reported that their CSF or related research has or is contributing to leveraging further funding for their department or institution. All academic stakeholders also indicated that this is being achieved.

3.5.2 New research posts

All fellows reported student and staff posts that have been created by their CSF and related research. As Figure 3.6 shows, across all cohorts 88 studentships and 36.5 fulltime equivalent (FTE) staff posts have been created. This is evidence of the contribution made by fellows to building or strengthening research teams.

Figure 3.6: Research studentships and staff posts attributed to CSF and related research (n = 18)

	Cohort 1 (n=8)	Cohort 2 (n=5)		Cohort 3 (n=5)		All cohorts (n=18)
	CSF & Related	CSF	Related	CSF	Related	
No. of research studentships created	51	13	12	11	1	88
No. of research staff posts created (FTE)	11.5	8.5	9.5	6	1	36.5

3.5.3 Recognition of research excellence for fellow’s department

In order to identify the extent to which their research has or is contributing to the recognition of research excellence for their departments, fellows were asked to report if their CSF and related research was submitted for the 2008 Research Assessment Exercise (RAE) or is being earmarked for submission in the 2014 Research Excellence Framework (REF). RAE and REF are the systems used by the four higher education funding bodies for assessing the quality of research in UK higher education institutions. REF is the new system which is replacing the RAE and will be completed in 2014. Fellows were also asked whether they thought their research had or was contributing to their department or institution being recognised as a centre of excellence for academic research.

As shown in Figures 3.7 and 3.8, most of the completed fellows reported that their CSF research or related research had been submitted in the 2008 RAE. Over half of all fellows said their CSF research has been earmarked for REF 2014, with the remainder reporting that they didn’t know. In interview, the fellow who reported ‘no impact’ on their department or institution being recognised as a centre of excellence for academic research attributed this to the period since 2008 having been challenging in terms of attracting sufficient funding to develop the research capacity that is required for recognition of excellence.

“This has been a challenging time with little external funding to support clinical training fellows to work with me. The next step, or big challenge, is to fund a basic scientist position or post-doc to work with me in my laboratory studies” (CSF fellow, Cohort 1).

Figure 3.7: Contribution of CSF research to recognition of research excellence (n=18)

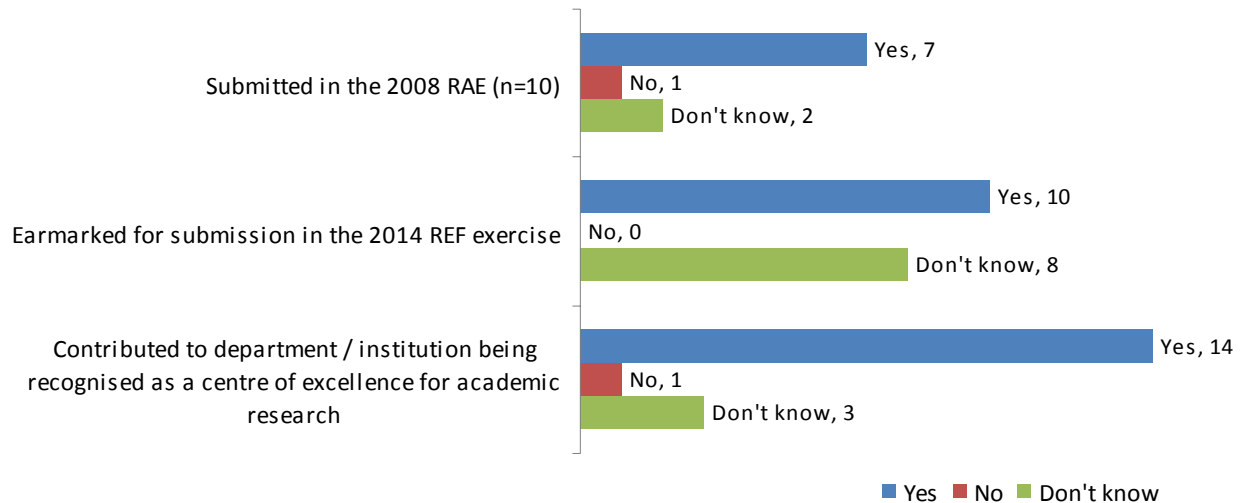
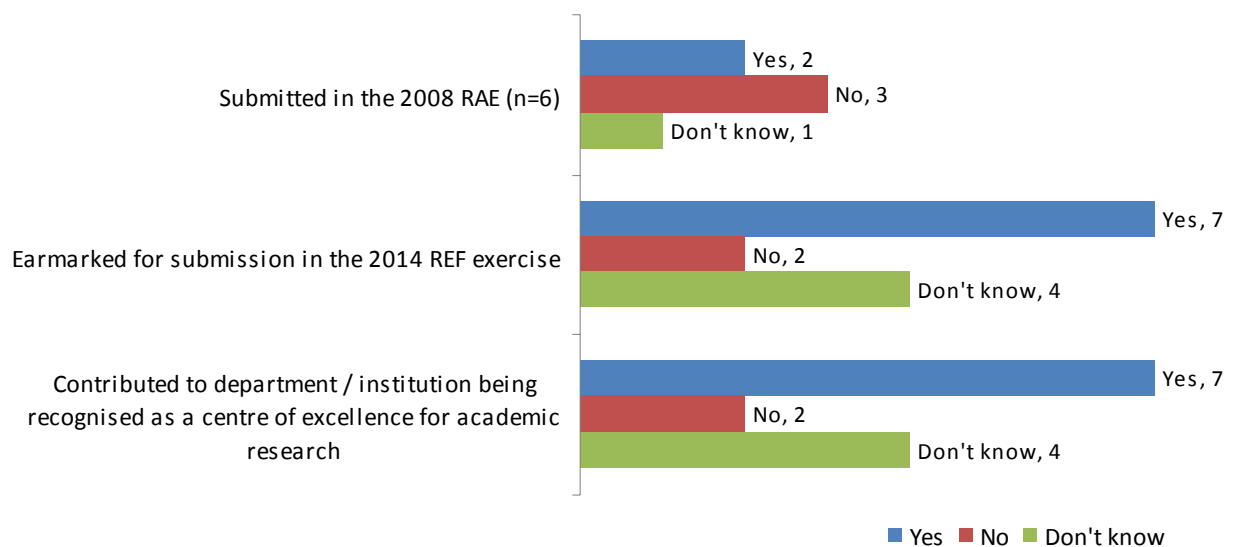


Figure 3.8: Contribution of related research to recognition of research excellence (n=13)

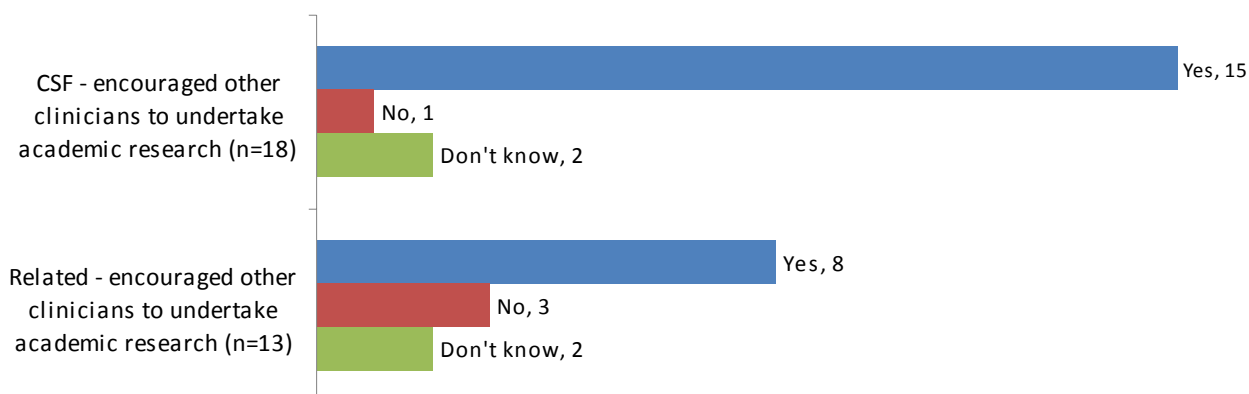


For research to be recognised by departments and institutions, it has to be of high quality. During the interviews, fellows highlighted their doubts as to whether their publications in journals that are significant in a particular field but have a low impact factor in comparison to generalist medical journals would be put forward in the REF. However, all academic stakeholders said that based on their experiences with their own fellows they thought it was likely that all the recipients of the fellowships were carrying out research that is of sufficient quality to be considered for submission in REF 2014. These stakeholders were more likely than fellows to consider research quality and impact more broadly than the citation impact factor of a journal.

3.5.4 Encouraging other clinicians to undertake academic research

Most fellows reported that their CSF or related research had or was encouraging others to undertake academic research, as seen in Figure 3.9.

Figure 3.9: Impact of CSF and related research on encouraging other clinicians to undertake research



In interview, most fellows described a range of positive impacts on departmental growth, reputations and inspiring others to undertake research.

“The impacts can be translated as benefiting the wider department, for example the employment of others in the team, including laboratory scientists, clinicians etc.” (CSF fellow, Cohort 2).

“The increase in the quality of academic research and also the kudos associated with the CSF award has resulted in the increased number of clinical lecturers appointed to my department over recent years” (CSF fellow, Cohort 1).

Most fellows said in order for them to be given the opportunity to build research capacity they needed to be as widely recognised as possible within their own departments and institutions in order to build research capacity. Some of the wider recognition was attributed to non-research activities such as the teaching and supervisory roles undertaken by fellows.

“I help run a course in the University and am teaching within the hospital. I have higher degree students in the lab that I am supervising. I think I have inspired people in my clinical area. The award has increased my visibility – people are aware and interested and have a role model” (CSF fellow, Cohort 3).

Academic stakeholders described a range of impacts that fellows were having or had on their departments and institutions, indicating that they are emerging or have emerged as research leaders, which is an important objective of the CSF scheme. For example:

- Becoming senior members of research teams, establishing their own teams and influencing the work of other researchers.
- Being awarded personal chairs and supervising other members of staff.
- Being identified as role models who are demonstrating that it is possible to pursue research in craft and other vulnerable specialties.
- Receiving formal recognition by their institutions as potential research leaders.

“The contribution to the wider department is significant. It has helped to portray an important message that it is possible to pursue research in a so called ‘craft’ speciality. She has been a very good role model in that she has demonstrated how it is possible practically to do this” Professor Jayne Franklyn, Head of School for a Cohort 2 CSF fellow.

“In terms of the institution the CSF has been very beneficial. [The CSF fellow] is now one of the senior members of the research team. He has been awarded a personal chair and is supervising other members of staff. There has been a very beneficial impact on the Department. Imaging and genetics research fellows have really taken on the psychiatric genetics side of things from his research. More recently we have developed expertise in stem cell biology linked to this work and got significant funding - about £4 million” Professor Stephen Lawrie, Head of Department for a Cohort 2 CSF fellow.

3.6 Research collaborations

Collaborations are important in helping fellows to establish their research reputations and for encouraging inter-disciplinary work, and translational research. As Figure 3.10 shows, all fellows reported that their CSF and related research has led to new research collaborations. Across the three cohorts a total of 77 UK collaborations, 58 international collaborations and 16 involving industry were reported. Industry collaborations were higher for Cohort 2 than Cohort 1, which could reflect the different types of research funded in each round.

Figure 3.10: New collaborations attributed to CSF and related research (n = 18)

	Cohort 1 (n=8)	Cohort 2 (n=5)		Cohort 3 (n=5)		All cohorts (n=18)
	CSF & Related	CSF	Related	CSF	Related	
No. of new UK research collaborations	34	9	11	17	6	77
No. of new international research collaborations	32	10	9	5	2	58
No. of new collaborations with industry	4	6	1	5	0	16

Most fellows said they felt that the prestigious nature of the CSF award had helped to raise their own research profiles and to attract collaborators. All fellows said it was important that the CSF scheme had given them time and freedom to establish relationships and to network with potential new collaborators.

“Collaborations have resulted from the fellowship - an EU FP7 project and our UK network have come directly from the fellowship. Definitely I would say that the networking opportunities that you get from the fellowship are probably one of the most significant benefits for me” (CSF fellow, Cohort 2).

There were also examples of academic training collaborations that had developed from research funded by the CSF scheme, such as:

“I host a different technical medicine student every 3 months from a University in the Netherlands. I’ve also hosted from a trainee surgeon from Rome – for 18 months as part of a PhD” (CSF fellow, Cohort 1).

During interviews, some fellows described collaborations involving industry, which they said were important in ensuring that research in certain areas is translated into patient benefits. Relevant stakeholders said that the fellows’ combination of clinical experience and research knowledge is an important factor in forming industry collaborations, which is explored in more detail in section 4.3.

“Having someone involved with a clinical background has been a real advantage. As a clinician, he has contributed to pre-clinical research from a practical perspective, for example choosing the appropriate delivery method for a drug. Seeing someone who spans the whole clinical-research divide ensures a very good scientific basis for the research as well as clinical understanding” Dr Diane Harbison, Head of Business Development, Edinburgh Bioquarter.

Case Study – Research collaborations

Dr Gareth Ackland, CSF in Anaesthesia

Dr Ackland researches cellular and humoral mechanisms associated with improving postoperative outcomes. During the fellowship he has established some important research collaborations, which he believes have been aided by the prestigious nature of the CSF scheme.

“New research collaborations are mainly down to the gravitas of the CSF. They have included international partners, e.g. in Canada. One of the large studies which I’m involved in has been a huge international study. It would have been pretty difficult to engender international interest without backing of the CSF award and my institution.”

In the last 18 months, Dr Ackland’s work has transformed in a relatively unexpected way through a multidisciplinary collaboration involving several departments within his university.

“At least one of the collaborations would have been impossible without the CSF. Basically that collaboration would not have happened without it and the gravitas it brings.”

3.7 Summary of impacts

There is evidence that the CSF scheme is achieving its stated aim of enabling clinical academics to cultivate important research programmes alongside their clinical practice. This was emphasised to be of key importance by stakeholders, particularly in relation to encouraging collaborations with industry. The highest research impacts appear to have been in:

- Enabling fellows to meet their research objectives and advance knowledge in their chosen field. For example, across all cohorts, fellows reported 297 publications in important journals, and 37 prestigious prizes have been awarded.
- Building research capacity through leveraging funding and research support to build new research groups and develop related projects, with fellows reporting leveraging a total of £49.36M in additional funding, a return of £4.45 for each £1 invested in the scheme.
- The formation of important collaborations, at the inter-disciplinary level, and involving industry and the NHS, with 135 new research collaborations reported across the UK and internationally.
- Establishing the CSF fellows as leaders in their field and encouraging a culture of clinical academic research through teaching and supervisory activities.

The extent to which these impacts have been achieved appears to be influenced by the type of research, with more basic research taking longer to have impact, and the length of time since the award was made, with fellows in earlier cohorts reporting the biggest impacts. Interestingly, most current fellows were uncertain about the suitability of publications in niche journals with lower impact figures for the 2014 REF; however academic supervisors confirmed that fellows are working to the required level.

4 Clinical and healthcare impacts

Aim: To encourage fellowship holders to maximise their research through translation into clinical practice and wider healthcare policy.

A key aim of the scheme has been to encourage fellows to maximise the impacts of their research through translation into patient benefits where appropriate. To examine the extent to which this has been achieved, this section of the report examines a number of proxy measures, relating to the scale and type of impact, which correspond to a number of relevant indicators of success in meeting this aim. They include the extent to which CSF and related research has been, or is being:

- Applied in clinical practice.
- Translated into new products, interventions or services.
- Used to inform wider healthcare policy.

4.1 Impact on clinical practice

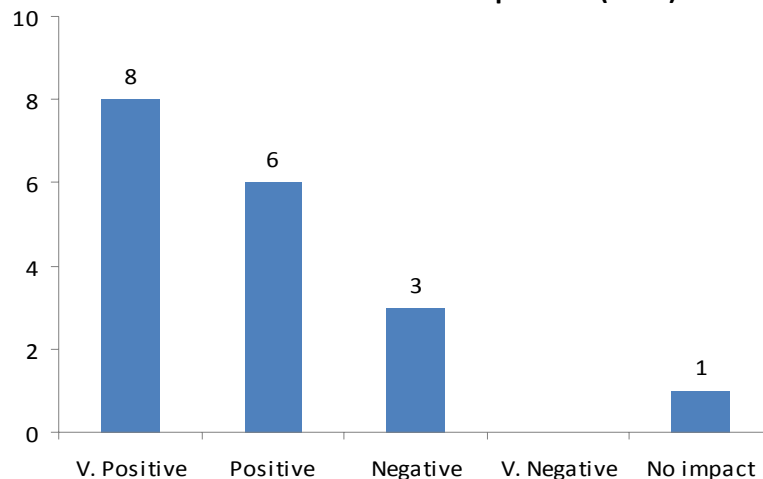
Figure 4.1 shows that for a majority of fellows, the scheme has or is having a 'very positive' or 'positive' impact on their own clinical practice. Three fellows reported a 'negative' effect on their own clinical practice. Of these, two current fellows indicated during interview that this was due to the time pressures of combining surgical training with research, and the third, who had completed their fellowship, attributed their answer to a lack of support within their local NHS environment.

"It is extremely challenging to combine higher surgical training and the research programme, which has led to several occasions where I have had to make very difficult choices between advancing my clinical training and progressing the research" (CSF fellow, Cohort 3).

One fellow reported that the scheme had not had any impact on their clinical practice or more widely to date; however, during interview they highlighted the basic nature of their research and noted that it was important to recognise that this may mean that significant wider and clinical impacts would take longer to emerge.

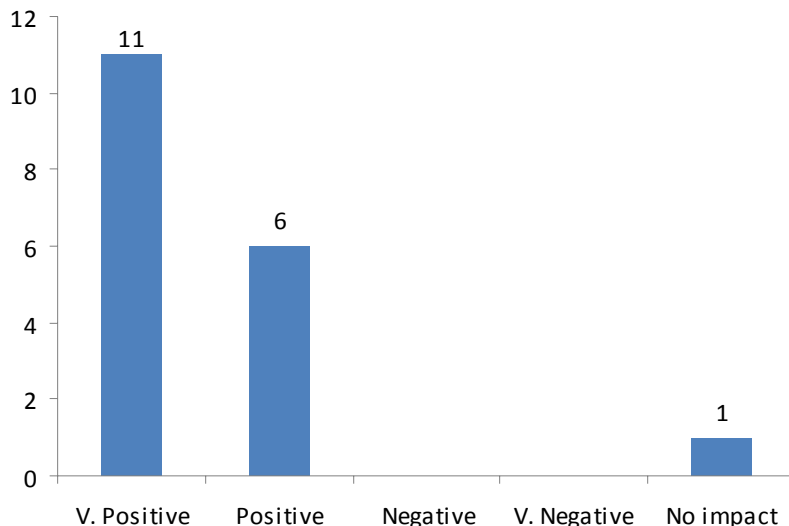
"I'm looking into basic scientific research in a clinical context, which is not going to impact on my clinical practice in the immediate timeframe. If it was a more applied type of research then it could be different, but it is basic research" (CSF fellow, Cohort 2).

Figure 4.1: Impact of the scheme on fellow's own clinical practice (n=18)



Fellows were asked to rate the scheme’s wider impact, which was described as impact on other clinical practice, patient care and health policy. As Figure 4.2 shows, the majority of fellows felt that the scheme has or is having ‘very positive’ or ‘positive’ impact in these areas. The fellow who reported no wider impact also reported that the scheme had not had any impact on their clinical practice as explained above.

Figure 4.2: Wider clinical or healthcare impact of the scheme (n=18)



Academic stakeholders highlighted two significant areas around the clinical impacts of the CSF scheme. Firstly, they noted that it is important that the scheme is open to niche specialties that do not have a big charity-funding base to ensure clinical practice in those specialties is able to retain and benefit from high quality researchers.

“There is a significant possibility that without the CSF both the university and the research discipline - psychiatry - would have lost him” Professor Stephen Lawrie, Head of Department for a Cohort 2 CSF fellow.

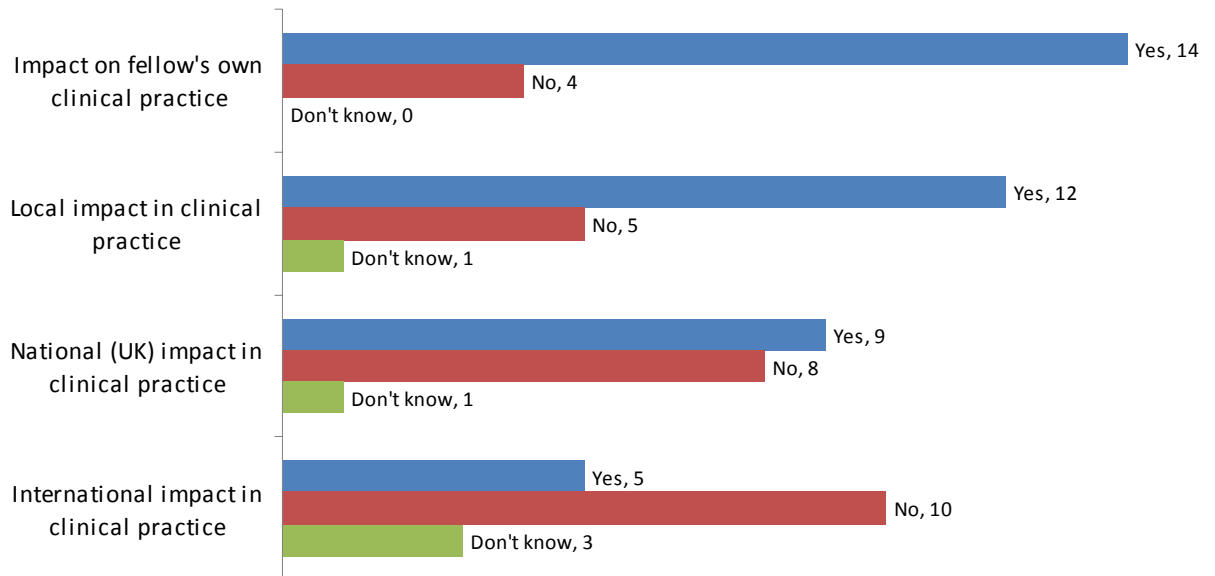
Secondly, academic stakeholders said that developing a group of individuals who are ideally placed to conduct translational research could enhance the reputation of the UK for research leadership.

“Key to the translation of research to clinical practice is an individual who skillfully combines the ability to translate from bedside to bench and from bench to bedside. Having someone with a good understanding of both sides is essential. The person is key to translational success” Professor Mervyn Singer, Supervisor for a Cohort 3 CSF fellow.

4.1.1 Scales of clinical impact

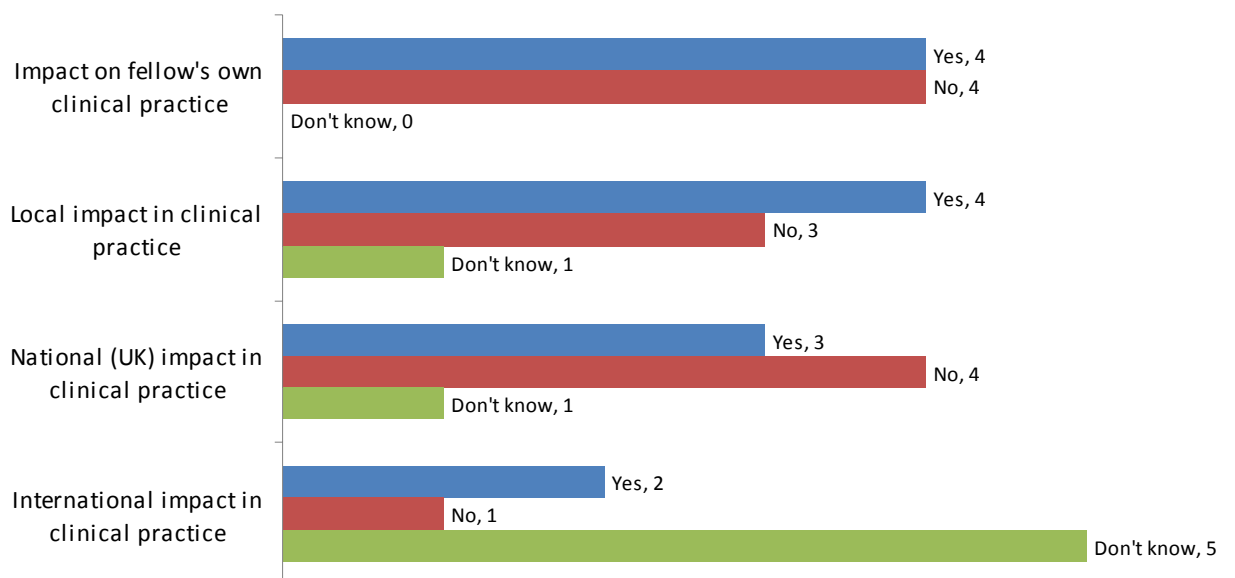
The previous section and Figures 4.1 and 4.2 refer to the CSF scheme's impact on clinical practice. This section examines clinical impacts arising from CSF research and related research. As shown in Figure 4.3, most fellows reported that their CSF research had impacts in their own, local or national clinical practice. Five fellows identified international clinical impacts.

Figure 4.3: Clinical impacts of CSF research (n=18)



As Figure 4.4 shows, eight fellows reported impacts from related research on their own, local, national or international clinical practice. During interview, three fellows reported specifically that their related research, and not the CSF research, was having an impact on their own clinical practice. They explained that this was because they felt that these clinical impacts were more closely linked to the related research.

Figure 4.4: Clinical impacts of related research (n=8)



Locally, fellows reported establishing new links with clinical practitioners and building clinical capacity within their specialties.

“When I started there were no surgeons with a specific interest in my speciality, whereas we now have two specialist surgeons in the speciality. The CSF scheme has also helped in terms of the implementation of our clinical service - there’ve been some technical developments and the standard of care has gone up for patients” (CSF fellow, Cohort 2).

Case Study – Clinical impacts

Professor Andrew McIntosh, CSF in Psychiatry

Professor McIntosh was awarded a CSF to examine brain structure and function in people at high risk of schizophrenia or bipolar disorder for genetic reasons. The award allowed him access to the high-risk patient subjects that are central to his work and to build upon this in future investigations. Following on from the CSF, Professor McIntosh looked at the information conveyed by a combination of human clinical, genetic and brain imaging assessments *in vivo* – and developed an experiment to obtain brain tissue for genetically vulnerable individuals for study *in vitro*. This is a groundbreaking area of discovery.

Professor McIntosh has a consultant role for the University Health Centre and runs a clinic for bipolar disorder. His clinical practice is underpinned by the CSF research.

“My research has led to greater clinical awareness of the high risk state of vulnerability for schizophrenia and mood disorder. My work emphasises the importance of looking at ‘high risk’ subjects to prevent the long term effects of psychiatric disorders.”

Half the fellows reported national clinical impacts and nearly half reported international impacts. The majority of these national and international examples are partnerships and clinical trials, which are examined in more detail in section 4.2 below. Some fellows reported cases where training activities have resulted in clinical impacts through trainees adopting clinical guidelines for use in their own hospitals in the UK and overseas.

“We get a lot of specialist trainees within my field who wish to come and work in our unit to get experience and to get involved with some of our research and they often take back our clinical guidelines and use them in their own institutions, nationally and internationally” (CSF fellow, Cohort 1).

Fellows from Cohorts 1 and 2 were more likely than those in Cohort 3 to identify national and international clinical impacts, which probably reflects the length of the timescale necessary for changes in clinical practice to spread geographically.

NHS and translational stakeholders said that the CSF scheme is helping to improve patient care at the same time as boosting the UK’s reputation for medical excellence.

*“These people [CSFs] help to build the reputation of the UK for research leadership. There are local, national and international impacts on patient care. Nationally, others will send their patients to such people for the best treatment. The scheme also benefits the reputation of the UK overseas and the international collaborations involving CSFs are an important factor” **Dame Julie Moore, Chief Executive, University Hospitals Birmingham NHS Foundation Trust.***

4.1.2 Increasing research awareness and application in the NHS

Often, the knowledge created by CSF fellows can only be applied more widely through partnerships with other clinical academics and clinicians. Most fellows drew attention to the importance of working in conjunction with clinical staff and healthcare workers to achieve clinical impacts and said there was a demand for their research.

“Another thing that has been positive is that clinicians on the front line genuinely want contact with people who are researchers in their direct field of interest. They are crying out for people to take an academic interest in their area” (CSF fellow, Cohort 3).

Case Study – Clinical application

Dr Elspeth Whitby, CSF in Radiology

Dr Whitby’s CSF research examined the use of magnetic resonance imaging (MRI) as an adjunct to ultrasound for foetal imaging where ultrasound images have given uncertain diagnosis, thus aiding accurate diagnosis and monitoring outcomes for both mother and baby. She is now widely recognised as providing an important foetal MRI service which accepts referrals from centres throughout the UK.

“For some centres I will report all their scans and I’ll also train their radiographers who then take over reporting, with me double-reporting as back up. Other centres send selected scan images for me to report, meaning they get the quality of service and specialist expertise in particular cases.”

Collaboration is key to Dr Whitby translating her research into practice and increasing patient benefits. She works closely with her clinical colleagues in neonatology, pathology and obstetrics to collect outcome data which determine the value of foetal MRI in clinical practice.

“Locally I am working very closely with clinical colleagues without whom I could not do any research. They have decided that they want the answers and so they’ll pay for it. It means that my patients are referred clinically and I get research money for providing extra patient care.”

Partnerships between fellows and clinical practitioners were highlighted by stakeholders from the NHS as an important factor, which contributes to the clinical application of research and embeds a culture of research more widely in healthcare. It also has the potential to boost morale amongst clinical staff.

“The idea of clinicians pursuing research is good for individual morale, as it allows the fellows to explore something that they really want to. This could inspire others or have wider impact within NHS through the fellows themselves who have a responsibility to make their role and work known by others - their Trusts, the nursing staff and trainees” Dame Julie Moore, Chief Executive, University Hospitals Birmingham NHS Foundation Trust.

4.1.3 Optimising clinical protocols

One of the ways in which CSF research can improve quality of care is by informing and optimising local and national clinical protocols and guidelines. Most fellows in Cohorts 1 and 2 described examples of where this has already happened and fellows in Cohort 3 described how they were starting to contribute to clinical guidelines. Examples include UK guidelines for imaging, radiotherapy treatment and management of pancreatitis.

“My research has been used to modify local clinical protocols about how and when patients are referred to us, and how they are subsequently managed. These are now used by our hospital and by the referring hospitals in our district” (CSF fellow, Cohort 1).

“My head of department is involved in the group that is testing out the related NICE (National Institute for Health and Clinical Excellence) guidelines for the management of injury in this field, and so I have an impact in that he’s feeding back anything that we do into that group. The research feeds back to the NICE guidelines, the Faculty of Intensive Care Medicine and the Intensive Care Society” (CSF fellow, Cohort 1).

Case Study – Clinical protocols and guidelines

Dr Shiao-yng Chan, CSF in Obstetrics

Dr Chan researches thyroid hormone action in the foetal brain and in placental development and function. She has now achieved national and international standing and is increasingly invited to speak at thyroid and foetal conferences. Dr Chan has created a new clinical service for pregnant women and has developed new guidelines; the finer points of which are based on her CSF research.

“I have piloted changes in the management of pregnant women with thyroid disorders through development and implementation of new guidelines locally, educating colleagues, junior doctors, GPs and clinical chemistry staff. My centre is amongst the first in the UK to implement such evidence-based changes in clinical practice and predates the publication of the American Thyroid Association Guidelines on this issue in July 2011.”

All stakeholders praised the CSF scheme for investing in individuals with the potential to contribute to improvements in patient care. Academic stakeholders said giving clinicians protected time to carry out and implement their research was an important factor.

“The time she [the CSF fellow] has had to become established is important. There have also been clinical impacts and a positive influence on patient care. She has had time and opportunity to create a new clinical service; the finer points of that service are based on her CSF research” Professor Jayne Franklyn, Head of School for a Cohort 2 CSF fellow.

The scheme was also deemed by non-academic stakeholders to be very relevant to the current focus of the NHS on quality of care and the increased recognition of the importance of research within the NHS, including in the development of clinical guidelines and protocols.

“The emphasis on competency-based training carries with it a risk of creating an army of technicians. These sorts of initiatives [CSF scheme], which emphasise research and identify and support exceptional people at an early stage in their careers represent a brilliant investment” Dr Robert Winter, Director, Academic Health Science System, Cambridge University Health Partners.

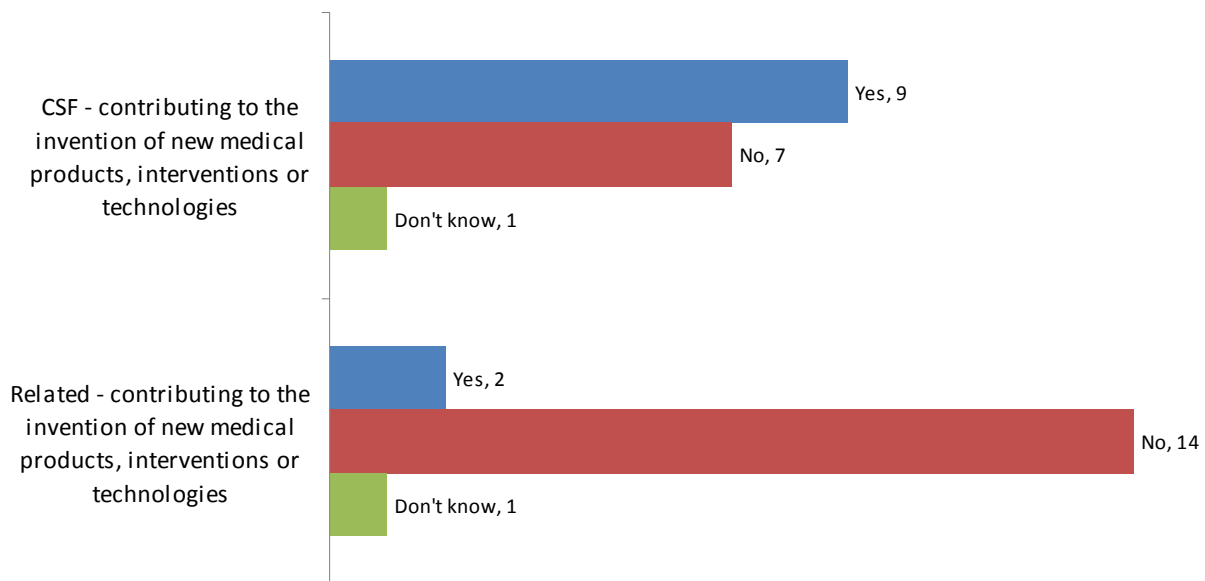
4.2 Developing new products, interventions or technologies

The creation of new products, interventions and technologies demonstrates the potential of the CSF scheme to create wider clinical and economic impacts. As Figure 4.5 shows, the majority of fellows reported these impacts. Using qualitative survey feedback and interview findings, the impacts have been categorised into clinical trials, new devices and techniques, and economic returns (see following sub-sections).

The five fellows who reported no impact of this type said this was due to the nature of their research, which they said was more likely to impact on procedures, protocols and policy than devices or techniques. One fellow who reported ‘don’t know’ indicated that their research could have these types of impacts in the future.

“I’ve said don’t know due to the nature of my research studies now - if it evolves into more societal or public health issues, then I see immediate economic relevance” (CSF fellow, Cohort 2).

Figure 4.5: New products, interventions and technologies from CSF or related research (n=17)



4.2.1 New clinical trials

During interviews, seven fellows from Cohorts 1 and 2 described examples of clinical trials where the safety and efficacy of products developed during their CSF research are being evaluated. These included national studies, international collaborations and trials carried out in partnership with industry. Whilst it is too soon to say how these trials will impact directly on patients, fellows pointed out that they have significant potential to improve care and treatments. For example:

“The recently commenced clinical trial may lead to the introduction of universal screening of this condition in women during preconception care and in early pregnancy. This will change the way antenatal care is currently delivered in the UK and increase the prominence of preconception care in general practice” (CSF fellow, Cohort 2).

Two fellows in Cohort 3 reported that their research could be translated via future clinical trials.

“Identification of this receptor as a potential therapeutic target has paved the way for a clinical trial in human cirrhosis and generated enthusiasm from industry” (CSF fellow, Cohort 3).

Case Study – Clinical trial

Miss Lorna Marson, CSF in Surgery Transplantation

The CSF Award allowed Miss Marson to concentrate on renal transplantation. Her research involved setting up a technical model which has been translated into an NHS-funded clinical trial that is attempting to reduce transplant injury at the time of transplant. She says:

“This clinical trial will look at how to minimise transplant injury by treating transplant recipients just before they receive a kidney from a deceased donor.”

In addition, Miss Marson and her team are undertaking a national study looking at factors that affect the time from extraction to transplant. Around 2000 transplant ‘journeys’ form this trial and local and national trends or variations will be examined in the analysis. The NHS Blood and Transplant Kidney Advisory Group and the Scottish Government are taking a keen interest in the trial and its findings, and it is expected to have an important impact on future health policy.

4.2.2 Developing devices and techniques

New medical products and techniques are one of the outputs of the CSF scheme that can impact on healthcare and practices. Five fellows reported and described in interview how their research had contributed to the invention of new medical products or techniques. The most significant of these were developing a new technique for sentinel node biopsy, optimising imaging techniques for assessing immature brain development and a new treatment for a previously incurable retinal disease.

“The CSF scheme has been an excellent investment in clinical research, which in my case has led to the development of two novel treatments for blindness in patients” (CSF fellow, Cohort 2).

Case Study – New devices or techniques

Mr Michael Douek, CSF in Surgery

Mr Douek’s interests are in translational research programmes that evaluate novel devices and imaging modalities to improve breast surgery for cancer. This research led him to develop a hand held magnetometer in collaboration with a physicist colleague at UCL. He also developed a magnetic resonance contrast agent, which resulted in the formation of a spin-out company called Endomagetics.

He is very appreciative of the CSF award and the opportunities that have arisen from it. He is the chief investigator of a national clinical trial that he developed during his fellowship. The SentiMAG multicentre trial is evaluating a new technique for sentinel lymph node biopsy. It has been adopted by the National Institute for Health Research (NIHR) and currently operates at six hospital sites in the UK and one in the Netherlands.

“The SentiMAG trial is ongoing. However I am confident that it will have a positive clinical impact. It has now recruited 161 patients, meeting the first analysis requirement and we are now analysing the results.”

4.2.3 Technology transfer

Three patents have been filed successfully based on CSF and related research conducted by fellows from Cohorts 1 and 2 in the fields of neurosurgery, paediatric surgery and ophthalmological surgery. Five fellows from all cohorts described how collaborations with the private sector are helping them to translate their research into new products and services with the potential to deliver economic benefit. These fellows also said they had benefited from learning about the process of commercial collaboration. This includes insights into the relationship between pre-clinical and post-clinical research and the importance of identifying the most relevant contacts in order to establish successful collaborative relationships.

“Meeting the right people is key. I met a guy who showed me a way into the company. It’s been an exercise in tenacity and resilience. I’ve learned a lot; both about confidence in myself and in dealing with commercial people and how to bring these collaborative projects along” (CSF fellow, Cohort 3).

Case Study – Technology transfer

Mr Damian Mole, CSF in Surgery

Supported by the CSF scheme, Mr Mole is researching the prevention of acute lung injury in pancreatitis patients. He aims to work on preventing organ failure, looking in the longer term to reduce the pressure for intensive care beds.

His work was one of 20 opportunities that his university submitted to GlaxoSmithKline (GSK) for its DPAC (Discover Partnerships with Academia) scheme. In this case, the partnership is aiming to discover and develop medicines with the potential to treat severe acute pancreatitis. For GSK, the fact that Mr Mole is able to challenge research ideas from a clinical perspective is vitally important. He has contributed to this pre-clinical research from a practical perspective and is positive about the impacts that this partnership could have.

“I’ve got a GSK DPAC award that if successful will result in my research actually being translated. We’re well on the way to actually doing what the aspiration was at the beginning of the fellowship, which shows that it is possible.”

The publicity generated by Mr Mole’s collaboration with industry has helped to raise the profile of his institution’s translational research and has led to the identification of other research projects with commercial potential.

Stakeholders from the pharmaceutical industry and technology transfer offices said that the clinical understanding of the fellows combined with their research knowledge was a significant factor in delivering translational research with economic impact. It was pointed out that someone with a clinical background could contribute significantly to pre-clinical research, because fellows’ ability to challenge research ideas from a clinical perspective was highly beneficial.

“If someone is clinically qualified, they also have patient engagement, which should have a positive impact on research outcomes. Our Discovery Partnerships with Academia (DPAC) projects are undertaken by a joint team, with members from an academic group and GSK working towards a common goal. Having a clinician scientist as the partner adds significant value, bringing academic clinical expertise into those partnerships” **Dr Malcolm Skingle, Director, Academic Liaison, Glaxo Smith Kline.**

Technology transfer officers noted that people are key to the commercial collaborations that deliver economic impacts. For them, another advantage of the CSF scheme is the fact that fellows have a broader perspective and experience base than other researchers. This means that they regard partnerships to be part of their role, are very happy to develop collaborations and are willing to be approached by private sector representatives.

“We have been working with a fellow whose research has attracted substantial in-kind support from two major pharmaceutical companies. The ability to translate and see both sides - clinical and basic research - was a key element to attracting this support” **Dr Amy Lam, Business Development Executive, Edinburgh Bioquarter.**

4.3 Healthcare policy

CSF fellows also reported wider impacts on healthcare policy from their CSF or related research. Eleven fellows reported local impacts and six reported UK policy impacts as seen in Figure 4.6 and 4.7. Fellows from Cohort 3 were most likely to say their research was influencing local and national healthcare policies, which represents a positive trend for the scheme. It is not certain what is influencing this trend; it could be the type of fellowships that have been funded, the specialties that have been supported or an underlying trend for research having a greater influence on healthcare.

Figure 4.6: Health policy impacts from CSF research (n=18)

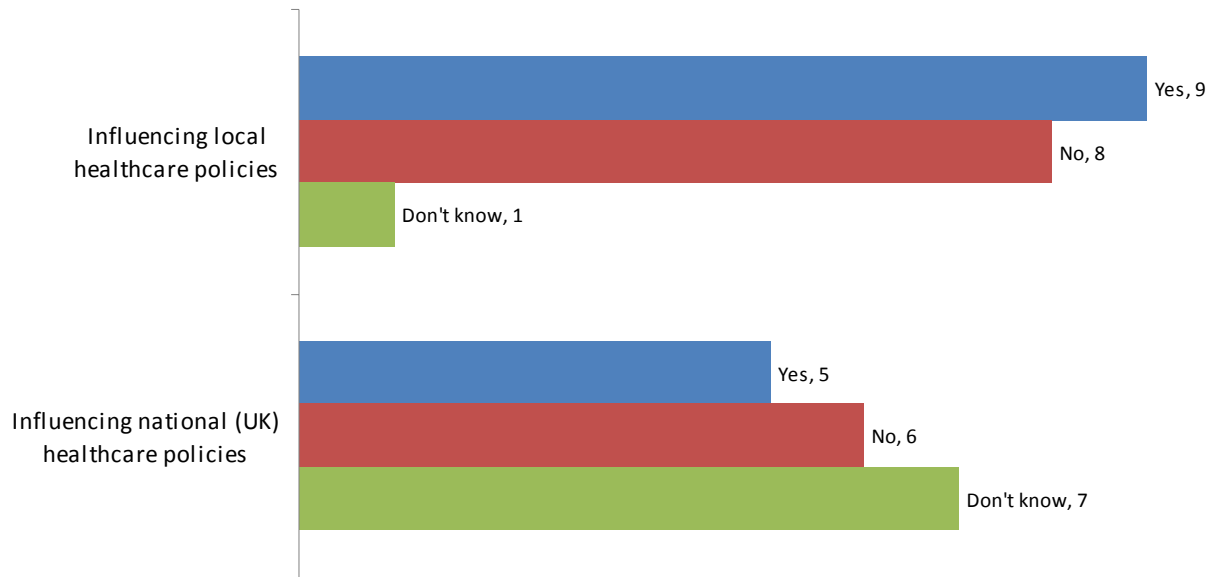
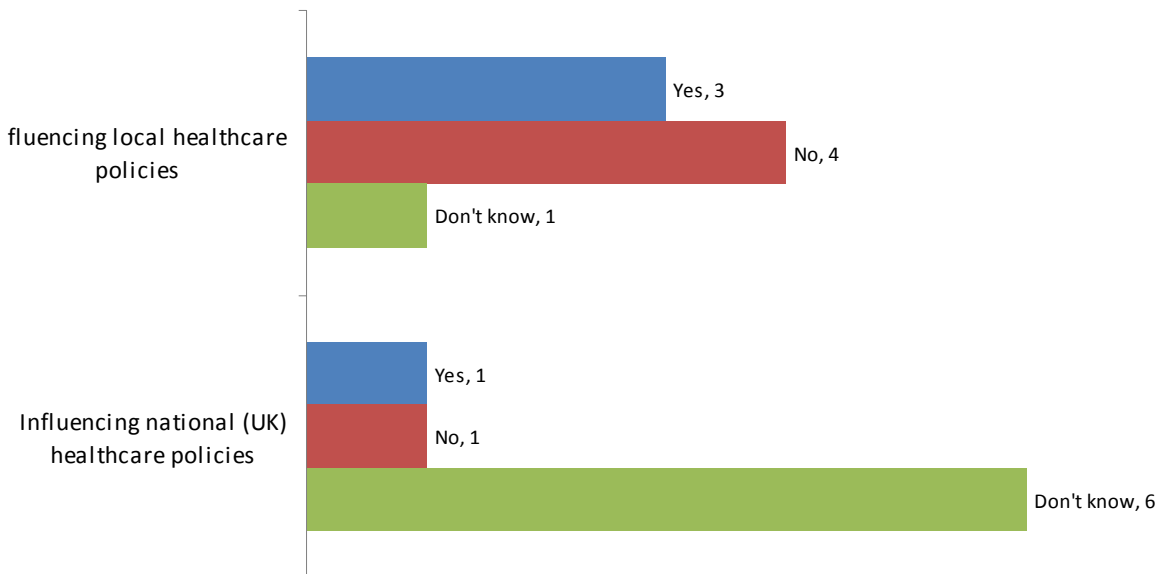


Figure 4.7: Health policy impacts from related research (n=8)



Local examples of influence on healthcare policy include policy guidelines for treating and handling patients. Key policy impacts on the national scale include the development of NICE guidelines, which have had a direct impact on policy decisions.

“The study was published in Annals of Surgery and allowed me to contact NICE to ask for the development of a UK guideline in this area. The NICE guidance uses the published evidence and is now nationally and internationally available” (CSF fellow, Cohort 1).

“My research has contributed to standards and health care policies in this field, e.g. my work with the British Thyroid Association” (CSF fellow, Cohort 2).

Fellows also identified examples of where their research was likely to impact on future healthcare policies, including those relating to brain injury and organ donation.

“In terms of affecting health policy in the future, the trial is conducted alongside the Department of Health’s Clinical Advisory Group and also involves the Driver and Vehicle Licensing Agency. It is envisaged that on successful completion, this work will set new UK - and possibly wider - standards and guidelines for the improvement of patient outcomes” (CSF fellow, Cohort 1).

Case Study – Policy

Mr Luke Devey, CSF in Surgery

Mr Devey has set up a large study that looked at 26,300 patients entering intensive care at UK hospitals and explored an extensive range of parameters pertaining to their organ donation. The findings, which have been submitted for publication, are likely to influence UK organ donation policy in the future.

“I have undertaken large epidemiological studies, which have made important findings about the demographics and outcomes of organ donation. They show a natural shrinkage of the donor resource arising from improved critical care management of intracranial bleeding. This important finding is likely to affect planning with respect to the organ donor resource.”

4.4 Summary of impacts

The data indicate that the CSF scheme has had a positive impact on fellows’ own clinical practice and on healthcare practices and policy at local, national and international levels. The most significant of these are that it appears to have contributed to are:

- New or optimised local and national clinical protocols and guidelines, for example for radiotherapy treatment and the management of pancreatitis.
- New clinical trials to evaluate safety and efficacy of products developed during CSF research, such as a national study to reduce transplant injury in renal transplantation.
- The development of new devices or technologies, such as a new technique for sentinel node biopsy, which has is being evaluated in the UK and the Netherlands.
- Establishing partnerships with industry and the filing of patents in the fields of neurosurgery, paediatric surgery and ophthalmological surgery.

For industry and healthcare stakeholders, the expertise of the fellows in both research and clinical practice, and their experience of working in partnership, across disciplines and with industry, are key attributes that increase fellows’ potential value and contribution to translational medicine. For fellows, openness to new ideas and accessibility of commercial partners are important factors in establishing effective technology transfer partnerships.

Where there were less evident clinical or healthcare policy impacts, fellows and stakeholders felt it was important to recognise the different timescales that basic research may require to manifest such impact. High-level stakeholders emphasised the benefits that such schemes produce, such as increased research awareness and application in the NHS, by helping to build the reputation of the UK for research leadership, building NHS staff morale and encouraging evidence based changes in clinical practice.

5 Leadership and career development impacts

Aim: To nurture the next generation of clinical academic leaders capable of leading development in their discipline by assisting them to become independent researchers and to create and lead research teams.

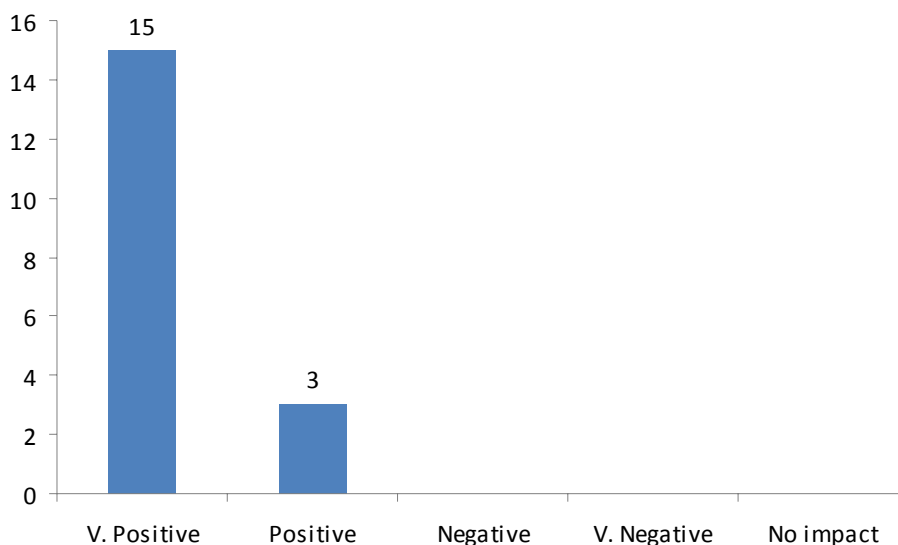
The creation of clinical academic leaders has been an important aim of the CSF scheme since it was launched. Key indicators of success for measuring the degree to which the scheme has been successful in achieving this aim are the extent to which fellows have:

- Achieved individual success as indicated by professional development and career progression; and
- Been recognised as leaders by others and encouraged others to pursue clinical academic research.

5.1 Overall impact on careers

As Figure 5.1 shows, all fellows rated the scheme's general impact on their careers as 'very positive' or 'positive'.

Figure 5.1: CSF scheme's impact on fellows' careers (n=18)



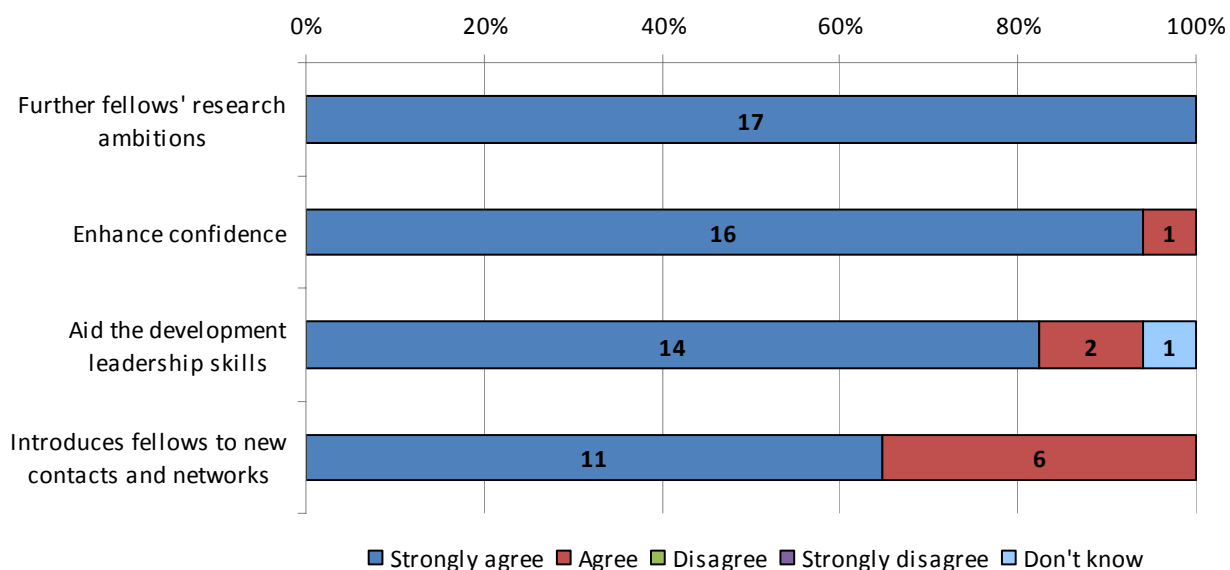
The Academy and The Health Foundation have carried out their own evaluations of their mentoring and leadership programmes respectively, and this evaluation did not seek to assess either of these programmes specifically. However, where CSF fellows referred to these during this evaluation, the findings have been reported below and in Chapter 6.

5.2 Professional development

All fellows, with one exception in one area of impact, reported that they 'strongly agree' or 'agree' with statements about the extent to which the scheme has had a positive impact on their research ambitions, leadership skills, confidence and networking (see Figure 5.2 overleaf), with the vast majority indicating that they 'strongly agree'. The one fellow who reported that they did not know if the scheme had aided the development of their leadership skills was a member of Cohort 1, and had not undergone The Health Foundation leadership training that is now offered to all fellows. In

interview, this fellow said they mentor trainees, which implies that they have been recognised as a role model.

Figure 5.2: Professional development impacts of CSF scheme (n=17)



All fellows reported that they have benefited from career development support, including the Academy's mentoring scheme and, for those cohorts that were offered it, The Health Foundation's leadership programme. They described the benefits of this support as increased confidence along with a broader perspective gained through mentoring or interaction with other fellows, and a perception of enhanced respect from colleagues, due to the prestige of the award.

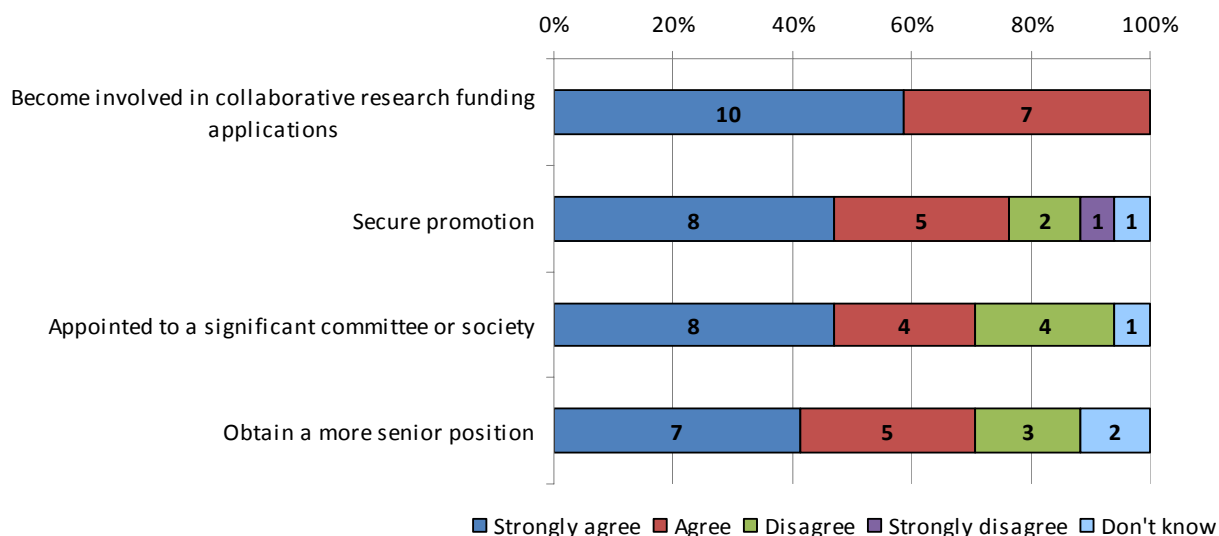
"The leadership scheme has provided very useful insights into the wider non-technical skills that can help me to achieve my career goals. Furthermore, it has provided me with a peer group of other clinician scientists at a similar stage of their careers with whom I can share experiences" (CSF fellow, Cohort 3).

5.3 Career progression

The majority of fellows reported that the CSF scheme was having an impact on a number of different areas associated with career progression as evidenced by Figure 5.3. This shows the extent to which they agreed or disagreed that the scheme had helped them to secure promotion, become involved in research collaborations, obtain a more senior position or be appointed to a significant committee or society. All the fellows who reported 'don't know' in relation to these indicators are members of Cohort 3 and have not yet completed their fellowships.

In relation to the impact of the scheme on enhancing the fellows' ability to secure promotion, the two fellows who reported 'disagree' were also yet to complete their fellowships. The fellow who strongly disagreed in relation to this indicator had completed their fellowship and said in interview that although they had not obtained promotion, they thought that being awarded the fellowship had enhanced their confidence and helped them to secure tenure as a senior lecturer, indicating that the scheme has had other positive impacts on their career. This fellow also disagreed that the scheme had helped them to obtain a more senior position or be appointed to a significant committee or society. Others who reported 'disagree' in relation to these indicators said in interview that although these particular impacts had not happened to them, they did feel that the scheme's overall impact on their careers was positive.

Figure 5.3: Career progression impacts of CSF scheme (n=17)



In interview, all fellows from Cohorts 1 and 2 described a variety of impacts on their careers that they attributed to the scheme, including progression to senior fellowships and tenured appointments. Importantly, several fellows said they would have probably not have continued in their research field without the CSF award.

“I was fortunate enough to actually get a tenured position post that followed the CSF. Without that I think I would have struggled to continue within this field and it’s much more likely that I would have had to go back to a full time clinical post” (CSF fellow, Cohort 1).

“I think without it I would probably have gone to an NHS job by now. I had five years to actually get the papers out, do the networking and get myself established as a researcher that was going to get other grants” (CSF fellow, Cohort 1).

Case Study - Career impact

Dr Raj Jena, CSF in Radiation Oncology

Dr Jena’s CSF research investigated optimisation of radiotherapy treatment for patients with high-grade tumours of the central nervous system. It has influenced protocols for how radiotherapy treatment imaging should be carried out. As a result of the award Dr Jena was able to take up a post at Addenbrooke’s Hospital and work as a clinician scientist there. He says that the career support provided by the CSF scheme has also increased his confidence in several ways.

“I’ve gained professional confidence in terms of knowledge in my field and my development as an expert that is respected by his peers. I’ve also got increased personal confidence in ... management and leadership. The scheme has been a springboard, as without it I don’t think I would have had the same level of acceptance and recognition within the community.”

The prestigious status of the CSF award and the leadership training were identified as significant factors in influencing fellows’ development and progression.

“It was a five year block of funding with status. That gave me a step up the ladder to get my CV recognised in other grant applications and it’s just opened up other doors for my career” (CSF fellow, Cohort 1).

Fellows in Cohorts 1 and 2 indicated that the scheme was not particularly well known in their departments at the time of their awards, which had limited their potential to be regarded as role models. However, awareness and understanding about the scheme appears to be increasing, and

fellows in Cohort 3 indicated that departmental recognition of the scheme had been helpful in raising their personal profiles and reputations.

“Because people have had CSF fellowships at my institution previously, there is perhaps a greater awareness or understanding of the scheme here compared to other places. It has certainly given me a platform to work from, because people know the scheme is important” (CSF fellow, Cohort 3).

All fellows in Cohort 3 said in interview that they were planning the next steps in their careers. Four of them described the uncertainty that they felt around their future career progression, especially in regard to whether they would attain a tenure track position within their university. In particular, although these fellows highlighted the strengths of the scheme in providing them with the opportunity to pursue their research, towards the end of the award they noted feelings of insecurity as their focus was shifting to looking ahead at opportunities through which they could continue their career in clinical academia. These views were in clear contrast to Cohorts 1 and 2, and Cohort 3 fellows suggested they were influenced by the changing economic climate and the consequent general decrease in opportunities for progression available within academia.

“I am at a decision point within my career and developing next steps in an ongoing career in translational medicine is my core priority at present. The CSF not guaranteeing a tenured academic position within my institution means that reaching the latter part of my fellowship is a time of some uncertainty with regard to future options” (CSF fellow, Cohort 3).

“This isn’t a tenure track post. The answer is very complex about the impact on my career. It has given me the opportunity to do what I want to do and go to the next level, but the caveat to that is that it was always only a 5-year opportunity with no guarantee. I can’t say with certainty what will follow” (CSF fellow, Cohort 3).

Most fellows across all cohorts also reported that the CSF award had helped them to become involved in research collaborations, which in interview they indicated had been helped by the prestige of the scheme and the opportunity it has given them to carry out specific research and develop specialist knowledge.

“The expertise I’ve developed in this area of research has allowed me to enter collaborations in the wider field of translational immunology. For example, I’ve entered collaborations where my knowledge in immunology transplantation has assisted heart transplant research in collaborative tissue studies undertaken with a top University in the USA” (CSF fellow, Cohort 1).

“I set up a collaboration with the world’s leading group in this technology in Seattle. I went over there and we got the technology working. The CSF award gave me the breathing space to do this collaboration with a leading group” (CSF fellow, Cohort 2).

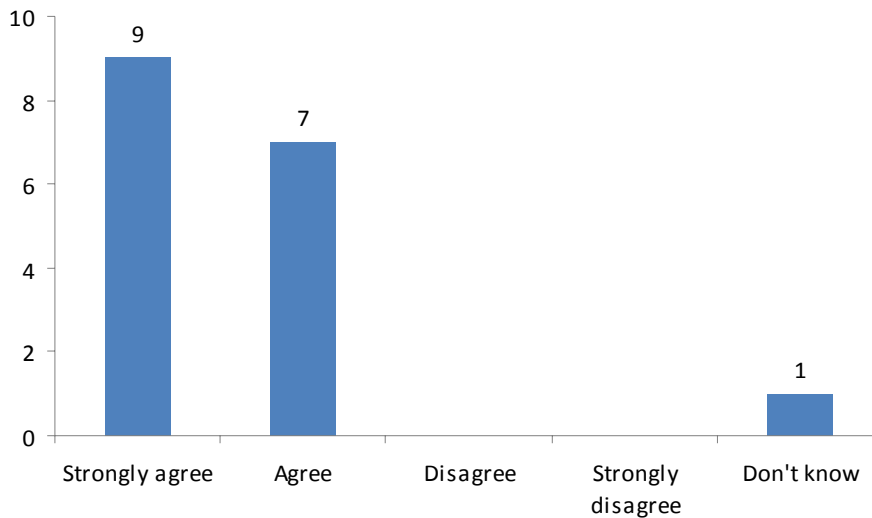
Stakeholders from academia and the NHS noted that CSF research outcomes are often more varied than is the case with a regular post-doctoral research post. This was a key positive impact and they stressed the importance of institutions and funders recognising all potential outcomes. They also suggested that further consideration be given to supporting and guiding fellows who are not appointed to senior academic roles.

*“It is important that the fellows’ clinical credibility is maintained. The support provided centrally by the scheme itself and locally e.g. by Speciality Training Committees should be consistent and must recognise the dual roles of the fellows” **Professor Stephen Powis, Medical Director, Royal Free London NHS Foundation Trust.***

5.4 Leadership

An ambition of the CSF scheme is for fellows to develop a reputation as a leader in their research field. As seen in Figure 5.4, most fellows reported that they strongly agree or agree that the CSF scheme has or is helping them to be perceived as an emerging leader in their field. The fellow who reported 'don't know' is a member of Cohort 3 and said that they would be in a better position to comment once the fellowship was completed.

Figure 5.4: Extent to which the CSF scheme helps fellows to be perceived as leaders (n=17)



Another indicator of leadership is for fellows to receive recognition from others, including through prizes and awards. As noted in section 3.4, across all cohorts fellows have received a total of 37 awards or prizes, which they attributed directly to their CSF research. These include awards made in recognition of fellows' career achievements and positions as role models. Examples include the 2010 Hunter Doig Medal awarded by the Royal College of Surgeons of Edinburgh to a fellow who has demonstrated career potential and ambition and made a significant contribution to surgery.

Case Study – Leadership and awards

Dr Gavin Pettigrew, CSF in Surgery

Dr Pettigrew's research aims to understand better how the body rejects transplanted organs, to explore whether rejection can be predicted and, where it occurs, to suppress it. The work carried out during Dr Pettigrew's fellowship enabled him to be nationally and internationally recognised as a leader in his academic field. As an academic leader, he is helping to develop the research capacity in his department. Dr Pettigrew is also directly supporting the careers of surgical trainees. He has been awarded a number of surgical training fellowships from Wellcome Trust and performs a mentoring role.

"I have mentored 8 trainee surgeons so far. I was awarded the ASiT (Association of Surgeons in Training) Silver Scalpel in 2010, and gave a presentation entitled 'Surgical Training' for the Royal College of Surgeons in England (RCS)."

ASiT awards the silver scalpel annually to inspirational trainers in recognition of excellence they have demonstrated in leadership, resourcefulness, training and development, professionalism, and communication.

All fellows reported that they have or are establishing their own research teams. They described supervising students or other research staff, indicating they have leadership roles. There were examples where students or researchers have specifically identified fellows as their preferred supervisors or trainers, indicating that these fellows were role models. Most fellows were modest about their leadership achievements, although some described examples where colleagues had recognised them as leaders.

“A colleague described me as ‘one of Europe’s leading experts in ...’. This made me realise what I’ve achieved. I suppose that the supervision and training I do here and at other hospitals probably does mean I am a leader, although I don’t think of myself in that way” (CSF fellow, Cohort 1).

“I’ve been supervising 5 biomedical students, who approached me for research training. I’ve also mentored an occupational therapist through a Masters degree. When people approach you for support, I suppose it does indicate that you are some sort of role model” (CSF fellow, Cohort 3).

All completed fellows said in interview that their institutions have recognised and rewarded their leadership qualities through either tenure or senior academic appointments. Most fellows in all cohorts also said that the CSF award helped them to develop the reputation and research outputs that are needed to secure such appointments.

“It would have been very difficult to progress without the CSF. Universities use it as a marker relating to the ability of an individual to progress in a research career and become an academic research leader” (CSF fellow, Cohort 1).

“The CSF award greatly contributed to my Senior Fellowship award. I’ve been told it marked me out as a potential leader and I believe it gave me an advantage in securing tenure when compared to my colleagues” (CSF fellow, Cohort 2).

Most of the fellows in Cohorts 2 and 3 who had received The Health Foundation leadership training said that it had enhanced their understanding of leadership and developed their leadership skills. Some fellows described how they had applied the learning from this training in their research and clinical practice.

“It was quite a potent combination to have that sort of training at the same time as implementing our clinical and research work. For instance, it opened my eyes to the power of collaboration in leadership. As a result, I am just making full use of all the collaboration opportunities that I can. This is benefitting me and my colleagues” (CSF fellow, Cohort 3).

5.5 Summary of impacts

The data indicates that the scheme has clearly helped to retain fellows within particular research fields and within research *per se*, with several indicating they would have switched to full time clinical positions or not have continued in their research field without the CSF award. All the fellows reported that the scheme had, or was having, a positive impact on their career, in various ways, for example by:

- Furthering professional development, by encouraging fellows’ research ambitions, enhancing their confidence and facilitating access to key networks.
- Aiding fellows’ career progression and encouraging promotion, for example through gaining senior fellowships and tenured appointments.
- Enabling fellows to become involved in collaborative research funding applications and to establish their own teams and influence the work of other researchers.
- Helping fellows to become perceived as emerging leaders in their fields or specialties.

Overall, CSF fellows and stakeholders said the prestigious nature of the award coupled with the support for leadership development were the most significant factors in influencing fellows’ career and leadership progression. The tailored and flexible nature of the award has allowed for a wide variety of career progression impacts, including senior fellowships, tenure appointments, chairs and promotions. These reflect the fellows’ own local circumstances and personal career ambitions. However, it is also clear that fellows in Cohort 3 are looking to continue their careers in clinical academic research in a more uncertain climate than earlier cohorts, and that there is appetite from both fellows and stakeholders for more support to be given to fellows at the end of their awards.

6 Delivering impacts

The Academy of Medical Sciences and The Health Foundation have a shared aspiration to advance clinical research and improve healthcare. Working in partnership, they have sought to provide prestigious, targeted CSF awards utilising the skills and expertise of both organisations. This section of the report examines how the structure of the scheme that they have devised has delivered impacts on clinical academic research, clinical and healthcare practice and individual careers and leadership, which have been presented in sections 3 to 5 above.

6.1 Building prestige through partnership

During the interviews, fellows across all cohorts noted that the two organisations responsible for the CSF scheme have different priorities and objectives, but said that they complement one another and highlighted the importance of the scheme being funded and managed by partners that have high profiles and significant reputations within both academia and healthcare. For example, they said the Academy of Medical Sciences is well known in academia and The Health Foundation has a high profile in the NHS.

“My impression is that the CSF effectively differentiates me from other people. The Academy of Medical Sciences has acquired a certain kudos which imbues the fellows with gravitas” (CSF fellow, Cohort 3).

“I think the Academy brought a really good academic pedigree and reputation in terms of clinical academia, and The Health Foundation has a reputation for healthcare quality - so they complement each other” (CSF fellow, Cohort 2).

“The AMS has visibility and The Health Foundation has money and also the leadership training, which has been extremely helpful. The Health Foundation could use the AMS Fellows to help with their visibility and raise awareness of themselves and the scheme” (CSF fellow, Cohort 3).

The great majority of stakeholders also said the partnership was important and mentioned the complementarity of the partners and the standing they bring to the scheme, which adds prestige to fellows. Stakeholders highlighted the benefit of partnerships in translational medicine, where they suggested that different partners offer expertise and insights that are relevant to different stages of the translational pathway.

“A partnership approach has a lot of advantages when operating in this translational area. As part of this, it is important that the partners act as ‘critical friends’ to one another as well as leaders. The imprimatur of the Academy of Medical Sciences and The Health Foundation is important as it provides cachet on the Fellows’ CVs” Dr Robert Winter, Director, Academic Health Science System, Cambridge University Health Partners.

Fellows and stakeholders described various characteristics of the CSF scheme that were perceived to have enabled it to produce impacts in research, clinical and healthcare outcomes and career progression, including:

- Encouraging clinical academia, especially in vulnerable areas, through rigorous selection, reporting and review processes.
- Enabling fellows to balance their clinical and research commitments.
- Supporting fellows to build their reputations and to become recognised as research leaders through accessing networks and career support.

6.2 Encouraging clinical academia

Fellows and stakeholders identified three main features that ensure the scheme is encouraging high quality clinical academia:

- Length of fellowship (5 years).
- Support for fellowships in disciplines that are academically vulnerable.
- Role of Academy Fellows in reviewing both the award applications and annual progress reports.

Stakeholders from academia and the NHS noted that the fellows have opted for a career path that is less secure than mainstream medicine and stressed that it was necessary to ensure that clinical academics were encouraged to pursue research, and to provide appropriate support to enable them to do so. All fellows and all academic stakeholders said it was important that the fellowships are awarded for five years, as this timeframe enables fellows to establish their reputations within academia, to publish papers in significant journals and to obtain follow-on funding. Most fellows also highlighted the importance of this timeframe in allowing them to complete their clinical training alongside their research.

“The duration, five years, is as good as you can expect. Three years may be OK for someone who is already established. Clinicians on the first step of their research careers don’t have the time, space or opportunity to establish themselves because of the pressures of training. So I think five years is excellent” (CSF fellow, Cohort 3).

A majority of fellows and all stakeholders from academia and the NHS highlighted the importance of having a scheme that encourages research in disciplines which are academically vulnerable, or where the number of researchers is small or perceived to be small. Craft specialties and surgery were mentioned repeatedly in this context. Most fellows said it was the only scheme available to clinician scientists in certain areas of research. They also said it was important to have a scheme that allows fellows to focus on their specific area of interest, and not to have to adapt their research or focus on other specialties to fit within the remit of larger funding programmes.

“It has been a hugely important opportunity for me. Having support for specific sub specialties and niches, which have not had much access to funding was great for me and my colleagues because it facilitated my continuation in this specific field” (CSF fellow, Cohort 1).

*“This can be a flagship scheme which ensures the whole surgical and medical landscape of clinical practice is covered in terms of research. It can catalyse addressing current gaps or shortages” **Dr Russell Hamilton, Director of Research and Development, Department of Health.***

Most fellows and all stakeholders noted that the rigorous selection, reporting and review processes were crucial to successfully encouraging clinical academia. The selection and post-award processes for Cohorts 1 and 3 were managed by the Academy of Medical Sciences, whereas The Health Foundation, in liaison with the Academy, managed the selection process and initially the post-award process for Cohort 2, with the Academy taking responsibility for the management of Cohort 2 after approximately two years. The partners worked together to try and ensure a smooth transition during this change; however Cohort 2 fellows said it resulted in some noticeable alterations in emphasis for the scheme, with reporting processes for fellows becoming more rigorous. The majority of fellows regarded this positively, as they felt that this peer review process would ensure that research outputs were of high quality and help to achieve wider awareness of the research being funded by the scheme. However, Cohort 2 fellows, who had experienced both processes, did note that the reporting process became more rigorous, and perceived it to have led to an emphasis on research outputs over individual development.

“The process for annual [CSF] reports and reviews became much more rigorous and they [the Academy] started a confidential peer review of your annual report. I think that was good in terms of the academic rigour of the programme” (CSF fellow, Cohort 2).

All stakeholders welcomed the peer review of annual progress reports, indicating that it helped to ensure that research outputs can be submitted for REF 2014 and have the potential to deliver patient benefits. The research and clinical impacts outlined in sections 3 and 4 are evidence that this is being achieved.

“It is absolutely vital that clinicians are able to pursue academic research. Specifically, for the future of the NHS and UK bioscience it is essential that the most gifted clinical academics are able to flourish. There are many examples of clinicians who have been supported and encouraged to develop a career in research and who have gone on to make major transformational changes in patient care, contributing to gains in both health and wealth.” Dr Robert Winter, Director, Academic Health Science System, Cambridge University Health Partners.

Most fellows and all stakeholders also noted that the rigorous selection, reporting and review processes helped to raise the profile of individual fellows and the scheme as a whole, including among other funders and potential collaborators.

6.3 Enabling fellows to balance their research and clinical commitments

Based on the interviews with fellows and stakeholders, the key features that appear to help fellows to balance their time between clinical and research activities are that the scheme:

- Provides protected time for research.
- Allows flexibility in regard to individual circumstances, including extensions and renewals.
- Encourages fellows to obtain other sources of funding.

All fellows and stakeholders said that having protected time and space to carry out research was essential in enabling fellows to achieve their research objectives.

“The strengths are having that chunk of money to support yourself over five years - having that breathing space is hugely important really and it’s just a unique opportunity to kind of set in train a piece of work and cement yourself in an academic environment” (CSF fellow, Cohort 2).

“The clinician scientist is a highly effective scheme that has significant advantages compared with going straight into a senior lectureship because the clinical workload is managed through protection of research time” Professor Jayne Franklyn, Head of School for a Cohort 2 CSF fellow.

Seven current and completed fellows who were or are finishing their clinical training during their fellowships said discussions with other CSFs had confirmed that they found the time demands to be more challenging than fellows whose training had been completed at the time their CSF awards were made. It was noted by most fellows and all academic and NHS stakeholders that craft disciplines require more hands-on training hours than medical disciplines, and that the issue of clinical time pressure was particularly acute for surgical fellows. Current fellows across the three cohorts felt that the scheme would benefit from additional support for research assistants to help alleviate this pressure and thought that such added support may enable them to balance their training, clinical and research time more effectively. This was deemed to be particularly important given the overall decrease in funding for research.

“Time management issues have the greatest impact upon both my scientific and clinical progress. This would have been alleviated in part by provision of a research assistant as part of the fellowship, as is done by other funders. What may not have been foreseen when the scheme was created was the

withdrawal of grant schemes of appropriate sizes to fund technical support that resulted from the financial downturn” (CSF fellow, Cohort 3).

Specifically, five Cohort 3 fellows and two from Cohort 2 said that a lack of funding for research assistance could increase the amount of time it takes to deliver research objectives. Most of these noted that other senior fellowships provide this type of funding and thought that it would be a valuable addition to the current scheme structure.

“The main deficit with the CSF is that it doesn’t come with additional funding for a research assistant. An Medical Research Council award would come with additional salary for this. I think that’s quite an important drawback, for a relatively small additional percentage outlay the output would be massively leveraged, provided that the fellow got the correct person to do the work” (CSF fellow, Cohort 3).

Academic stakeholders regarded this aspect of the scheme more positively. They suggested it could be useful for fellows to have to find their own funding for support staff and students, as this helps to prepare them as research leaders.

“In terms of the CSF scheme itself, the limit on the total amount of funding meant he [the CSF fellow] had to get top-up funds to conduct the amount of imaging that the research required. This is a strength as well as a weakness, as it is good for people to have to find their own funding in preparation for leading their own research teams” Professor Stephen Lawrie, Head of Department for a Cohort 2 CSF fellow.

All fellows and academic stakeholders praised the flexibility of the scheme for allowing fellows to pursue research in specific areas of interest. A few fellows who had their award extended or renewed said this flexibility had allowed them to complete their research programmes.

“I felt the investment was in the person, which is massively positive. I have been able to move institutions and extend my fellowship to achieve important outcomes” (CSF fellow, Cohort 2).

“It gave me the freedom to manage my own timetable, i.e. to schedule time both in the laboratory and in clinical practice and to undertake research in an area I am passionate about” (CSF fellow, Cohort 1).

Most fellows noted that the scheme is designed so that they develop their basic research and clinical expertise concurrently. They said that this factor, together with the leadership support, provided them with a broad perspective and range of experiences that are of particular value in bridging the gap between research and clinical practice.

“The scheme encourages your research and clinical practice to develop in parallel. Since the fellowship, my clinical work and research are totally intertwined, meaning one informs the other, which is exactly what academic medicine is pushing for” (CSF fellow, Cohort 1).

“Sometime the benefits are quite intangible - the combination of clinical and research experience plus leadership support has provided me with some incredible insights and skills. For me, it really got me thinking about the translational or implementation aspects of the project in an entirely different, but beneficial, way” (CSF fellow, Cohort 3).

6.4 Supporting career development

As noted in Chapter 5, this evaluation did not seek to directly evaluate the Academy’s mentoring programme or The Health Foundation’s leadership programme. However when asked about career impacts, all fellows said it was important for the scheme to provide support of this nature for a number of reasons. Those fellows who had undertaken the leadership training said it helps to differentiate the scheme from others, provides accessible and appropriate personalised support to help them to move towards or achieve research independence, and encourages networking

amongst fellows at workshops and training events. Academic stakeholders praised the leadership training for the experience and knowledge it provided to fellows.

“The leadership training has been a tremendously enlightening experience. It has taught me all sorts of things I’ve never learnt before. There is a ‘leadership box’ when you’re a clinician - most people go on a weekend course and tick the box – but this has been a more complete experience” (CSF fellow, Cohort 3).

The Academy mentoring scheme was said to have provided fellows with access to independent trained mentors, as well as further networking opportunities to promote their research and establish relationships outside their peer group. Academic stakeholders also highlighted the importance of mentoring. They and some fellows suggested that it could be challenging to identify suitable mentors within the smaller specialties. They said that this challenge was generic and not specific to the Academy’s mentoring scheme. Stakeholders also recognised that mentors do not always have to come from the same research area, something that was also mentioned by six fellows.

As noted in section 5.3 under career progression however, Cohort 3 fellows reported concerns about the present economic climate and the likelihood of attaining senior positions, as the availability of tenured positions appears to have diminished. This was also mentioned by some fellows in Cohort 2, who suggested that the Academy of Medical Sciences and The Health Foundation might want to consider the provision of ongoing support and advice for fellows who do not secure tenured positions.

“I have nothing but praise for the CSF award, although a slight negative point was the support given in gearing up for the transition from CSF fellow to senior fellowship - more support could have been offered in assisting in funding applications etc.” (CSF fellow, Cohort 2).

6.5 Summary of how impacts are delivered

The key ways in which fellows and stakeholders considered the scheme to have achieved the identified research, clinical and career impacts appear to be that it:

- Encourages clinicians to pursue academic research, when it is a less secure career path than mainstream medical practice, by supporting fellowships of sufficient duration to enable significant research outputs, particularly in niche or vulnerable specialties where research may not otherwise be supported.
- Uses Academy's Fellows to peer-review applications and progress reports, ensuring that talented candidates are selected to receive the award, that high quality research objectives are pursued, and that academic support is provided.
- Provides fellows with protected time to pursue their research in an environment where balancing clinical practice and research priorities is increasingly difficult.
- Allows the fellow flexibility in their use of the grant to develop and pursue existing and new projects, and, under certain circumstances, to extend the award.
- Enables fellows to develop a broad perspective and experience base in research, which enables them to bridge existing gaps between clinical practice and basic research.
- Provides fellows with opportunities to build their leadership skills, profile and professional networks, and to access a broad range of career support and guidance, such as mentorship.

7 Reflections

7.1 Strengths of the scheme

The Academy of Medical Sciences and The Health Foundation have devised an open and responsive scheme, which encourages applications from specialties deemed to be vulnerable. Overall, it appears to have been successful in delivering its objectives to enable clinical academics to cultivate important research programmes alongside their clinical practice, encourage fellowship holders to maximise their research, through translation into clinical practice and wider healthcare policy and to nurture the next generation of clinical academic leaders capable of leading development in their discipline. Benefits have been manifest for individual fellows, host research institutions, clinical practice, and wider stakeholders, and advances in the knowledge base and clinical practice have been identified which have arisen directly and indirectly from the research that has been funded by the CSF scheme.

Interviews with stakeholders and the impacts reported by fellows indicate that the scheme has developed a group of clinical academic leaders who have contributed to their own institutions' research rankings and reputation. The fellows have attracted significant amounts of research funding from high-profile funders and have achieved widespread recognition through significant publications and presentations at national and international conferences. They have also created research capacity and momentum within their own specialties, contributing to the establishment of centres of excellence. Importantly these impacts have occurred in areas that are perceived to be vulnerable academically.

Collaborations have been important, with clinical trials, translational developments and industry projects benefitting from fellows having both clinical understanding and research skills. CSF fellows have identified cases where their research is having significant impacts in clinical practice and on healthcare policy. Locally, the fellows have inspired other clinical academic researchers and helped to embed research in clinical practice. Nationally, a number of clinical trials have initiated from CSF research. Service enhancements, new treatments and improved practices are happening locally and nationally as a result of CSF-funded research. The research has also informed guidelines for clinical practice in a number of important areas including surgery and radiology.

Career impacts on individuals have been significant and relevant to fellows' personal ambitions and local environments, with fellows who have completed their fellowships having been appointed to senior clinical academic positions. There are significant examples of fellows creating their own research teams and developing research capacity within their own specialties, where they are acting as role models for others. Career support in the form of mentoring through the Academy of Medical Sciences, and the leadership development training provided through The Health Foundation, which was introduced for Cohorts 2 and 3, has been successful and praised for its quality and relevance to clinical academia by fellows and their supervisors.

7.2 Future development of the scheme

CSF fellows and stakeholders hold the scheme in high regard, and strongly support its continuation in the future, particularly as it is considered to be the only scheme available to clinician scientists in some areas of research. Key characteristics that were felt to be important and which should be retained in any future development include:

- Support in specialties which do not have a big charity-funding base, which ensures that clinical practice in these specialties is able to benefit from high-quality research.

- The flexible approach, which allows the fellow to use the grant to develop their research objectives and to pursue individual career objectives.
- The ability of the partners to complement each other, with The Health Foundation offering leadership training aimed at stimulating novel and innovative practice and the Academy taking a leading role in the peer-review process, the provision of a range of career support, such as mentorship and facilitating profile building and networking with Academy Fellows.

However, current fellows are concerned that the present economic climate means the attainment of senior positions may be more difficult for them, and fellows and stakeholders identified two areas where the structure of the scheme could be strengthened to ensure it reflects the changing context in which clinical academia is practiced:

- Provision of funding for research assistance to help fellows to balance their time more effectively.
- Further support at the end of the award to aid the transition to more senior awards and potentially tenured positions.

Stakeholders highlighted that the Academy of Medical Sciences and The Health Foundation have built up expertise and experience in managing a successful CSF scheme and are well placed to use this expertise to establish partnerships with other organisations especially smaller charity funders, who want to support clinician scientists in specialties that are not supported by mainstream medical funders but lack the necessary expertise or mechanisms to do so. Stakeholders also described opportunities, presented by the changes in the structure of clinical training, to develop new partnerships that could extend the impact of the scheme into the future, including partnerships with Local Education and Training Boards to strengthen local support for clinician scientists.

An important challenge for the Academy and The Health Foundation is to ensure that any opportunities for developing the scheme are fully realised and that their expertise and learning from this scheme are applied effectively to progress high quality clinical academic medicine, leading to the widest possible range of clinical, policy and career benefits.



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