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Stevenson, Chris James; Harris-Joseph, Helen; Harper, Lorraine; Hewison, Jenny; Mulvey, Matthew R; Heuvelman, Hein; McVicker, Clare; Razalan, Maria Magdalena; Knowles, Emma; Ebanks, Brad; Lee, Kieran; Fenton, James; Thompson, Peter; Cotterill, Lisa Ann

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Experience of an NIHR Clinical Lectureship (medical/dental) and the determining factors for a clinical academic career post lectureship: a mixed-method evaluation

Chris James Stevenson ,[1] Helen Harris-Joseph ,[1] Lorraine Harper ,[1,2,3] Jenny Hewison ,[4] Matthew R Mulvey ,[4] Hein Heuvelman,[4,5] Clare McVicker,[6] Maria Magdalena Razalan,[6] Emma Knowles,[1] Brad Ebanks,[1] Kieran Lee,[1] James Fenton ,[1] Peter Thompson,[1] Lisa Ann Cotterill [1]

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For numbered affiliations see end of article.

Correspondence to
Dr Helen Harris-Joseph; helen.harris-joseph@nihr.ac.uk

ABSTRACT

Objectives The objective of this study is to investigate early-to-late postdoctoral clinical academic progression and the experiences of NIHR Clinical Lectureship (CL) fellows, considering enablers and barriers to success, and identifying the factors associated with immediate progression to a clinical academic role following completion of the award.

Setting Datasets of CL awardees across the UK.

Participants For semistructured interviews, n=40 CL awardees that had finished their award within the previous 5 years. For quantitative analysis, n=1226 completed or currently active CL awardees.

Outcome measures The responses from the semistructured interviews to the defined questions on experiences during the award, postaward progression, and enablers and barriers to academic progression. Other primary outcome measures were quantitative data on first destinations postaward, demographic data, and whether an awardee had previously held an NIHR Academic Clinical Fellowship (ACF) or was a recipient of the Academy of Medical Sciences (AMS) Starter Grant.

Results CL awardees identified numerous benefits to the award, with the majority achieving their aims. Most awardees progressed to a clinical academic role; however, some returned to a clinical only position, citing concerns around the time pressure associated with balancing clinical and academic responsibilities, and the competition to attain further postdoctoral awards. The region of the award partnership, year of award end and success in applying for an AMS Starter Grant were associated with progression to a clinical academic role. Gender, holding an ACF and having a craft or non-craft specialty had no independent statistical association with clinical academic progression.

Conclusions The CL is a valued element of the Integrated Academic Pathway. By addressing issues around later postdoctoral progression opportunities, responding to challenges experienced by CLs, and by understanding the factors identified in this study associated with clinical academic progression, it should be possible to increase the proportion of CLs that become fully independent clinical academic research leaders.

Participants 1226 NIHR CLs active or completed on the award between 2006 and 2020.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Access to a comprehensive dataset of all clinical lectureships (CLs) (n=1226) from the start of the award in 2006 for quantitative analysis and an in-interview cohort of 40 CLs for qualitative analysis, allowing a mixed-methods approach, enabling triangulation of findings for robust investigation of the research questions.

⇒ Interviews conducted by researchers independent of the NIHR, enabling those completing or who have completed a CL to speak freely about their experiences and perceptions.

⇒ Limitations of the data available: personal characteristic information limited to gender; use of multiple datasets, with different starting points and different population sizes making comparative analysis more complex; limitations of using self-reported Researchfish data.

⇒ This study is limited to those who were successfully awarded a CL due to a lack of available (unsuccessful) application data.

INTRODUCTION/RATIONALE

The postdoctoral NIHR Clinical Lectureship (CL), alongside the predoctoral NIHR Academic Clinical Fellowship (ACF), is an integral part of the Integrated Academic Pathway (IAT) and was established to overcome barriers identified for junior doctors and dentists wanting to pursue clinical academic careers.[1] The CL is a postdoctoral award for doctors and dentists that provides protected time for higher specialty clinical

training and time for research to establish themselves as independent researchers and leaders. The standard duration of the award is up to 4 years. The intention is that the CL spends half of their time in specialist clinical training and the other half in research. The National Institute of Health and Care Research (NIHR) allocates funding for 100 posts in medicine and 11 posts in dentistry each year through the IAT Programme.

NIHR funding supports the hosting and management of the CL posts, by the IAT partnerships comprising the local offices of Health Education England (HEE), higher education institutes' medical/dental schools and NHS Trusts/organisations. NIHR funds the CLs full salary costs (both the clinical and academic components) and a £1000 annual bursary for conferences and travel. However, the award does not fund research/support staff costs, which awardees are required to seek from other sources, such as the Academy of Medical Sciences (AMS) Starter Grants for Clinical Lecturers.

An international body of literature has developed highlighting concerns around the future supply of clinical academics in the healthcare system,[1–9] and issues around clinical academic progression to early stage postdoctoral level,[10 11] including studies addressing gender difference in career progression.[7 12–15] Thus, a need to undertake an evaluation of the CL and its role in addressing the gap around clinical academic progression from early to late postdoctoral level was identified. The aim of this study was to identify barriers and enablers of CLs and factors that contribute to clinical academic career progression. By considering the factors that lead to further progression on the clinical academic pathway alongside the experiences of award holders, including the AMS Starter Grants scheme, we can propose recommendations that will strengthen this critical clinical academic pathway in England.

METHODS

Design

An integrative mixed-methods approach was adopted, starting with 40 single, in-depth semistructured interviews with CLs followed by the combined analysis of four retrospective award holder datasets. Three questions, spanning the duration of the award, were proposed and agreed by the NIHR CL evaluation advisory group, which was composed of senior staff/stakeholders from the NIHR Academy and AMS, to provide a framework to answer the overall research questions:

- What is the experience of CLs on the award?
- Where are CLs progressing after their award?
- What factors support/hinder clinical academic progression, with a particular focus on the impact of the AMS Starter Grants for clinical lecturers scheme; considered alongside other academic and demographic factors?

Where appropriate qualitative and quantitative methods have been combined to respond to each of the questions, for example, in the use of award management monitoring datasets and interview responses for the 'where are CLs progressing after their award' section.

In-depth semistructured interviews

Sample and recruitment

A purposive sampling approach to recruit 40 CLs for interview was adopted. A sampling quota approach was developed to attempt to recruit minimum numbers to interview, in specific areas of interest for the evaluation. This was not an attempt to 'mimic' the overall cohort breakdown, but to ensure enough numbers in identified groups of interest to yield reliable insight. The main eligibility criteria for inclusion was that the CL had completed their award within 5 years (to avoid issues of recollection) or were currently active on their award for 2 years or more; of 1226 award holders, 599 met the eligibility criteria to be interviewed.

Interviews were conducted independently of NIHR to mitigate against 'funder bias', that is, interviewees' responses being unduly influenced due to perceived pressure to respond positively to an NIHR interviewer. An external research agency, DJS Research, was selected to undertake and transcribe the interviews. The interview guide for active CLs and CLs who have completed their awards can be found in online supplemental files 1 and 2. The process of recruitment, screening, interviewing and transcribing is outlined below:

NIHR academy acquired permission/consent from CLs to share their contact details with DJS, while providing a participant information sheet outlining the purpose of the study, what the interview would involve and information about the confidentiality arrangements. DJS Research is compliant with data protection legislation, and awardee contact details were exchanged securely between NIHR and DJS Research and retained until the interviews were completed then they were deleted. DJS Research undertook, through emailing and follow-up phone calls, a second stage of interview screening and recruitment. Finally, they undertook the interviews and their transcription.

Interview process

Two separate interview scripts were used, one for those active on the award and one for those who had completed the award. Both scripts included questions covering all aspects of the award holder experience, from initial consideration of the award, to the post completion perspective. All interviews were conducted and recorded using video/audio recording software, by a group of four experienced interviewers. The length of the interviews ranged from around 35 to 60 min. An initial batch of four interviews was reviewed to test the effectiveness of the interview schedule, which led to a small number of minor changes in the wording of one question. No follow-up interviews were required as data saturation was considered to be achieved on completion of the first interview coding analysis.

Qualitative analysis

Interviews were transcribed verbatim for analysis. Transcripts were analysed within NVivo,[16] a qualitative data analysis tool, using an adapted version of the thematic analysis method,[17] a multistep framework for identifying themes in interview data. The approach to coding within this study was most aligned to the reflexive thematic analysis approach that has been well-described by Braun and Clarke.[17–19] Specifically, it was deductive and not structured through use of a codebook, it resulted in an array of individual codes being produced, it was 'recursively evolving', and it was only finalised at the end with researcher subjectivity (CJS) 'integral to the analytic process'.[18]

The coding process had several iterations, with the first author (CJS) essentially restarting the process after an unsuccessful initial attempt to align the coding more closely to the interview questions set, which did not prove successful due to the nature of the data in crossing over several questions when constructed into themes. In the second attempt at coding, the questions from within the interview were removed from the transcript and the interviewee responses in the transcripts were coded as a continuous text. Through this process, the first author sought to be 'actively and critically engaged with his research values, choices and processes—becoming 'knowing'', as described by Joy, Braun and Clarke.[18] Much work was undertaken to work with the very large number of codes to hone the themes to allow them to tell the most representative and accurate story of the interviews conducted, with other members of the team acting as 'critical friends' to check understanding and interpretation of the data.[20]

A reflexivity statement written by the first author (CJS), who undertook the qualitative analysis, has been provided as online supplemental file 3 to this manuscript.

A number of interviewee attributes were imported into the software to allow cross-referencing of interviews and codes against different academic and demographic factors. This was used to aid the triangulation of the qualitative interview data with the quantitative data analysis. Themes and subthemes developed under four broad headings were generated: preaward experience, experience during the award, postaward experience and future landscape and recommendations. Initially, emergent subthemes under these main theme headings were directly connected to each of the questions in the interview schedule, but due to considerable overlapping in transcript coding across the questions, a less rigid approach was adopted to allow coding across questions and question areas.

Retrospective analysis of NIHR datasets

Data sources

Data were collated from internal NIHR sources:

- Award management monitoring dataset, including award details, contextual and demographic data of all 1226 completed and currently active CLs, collected between 2006 and 2020 through the HEE local partnerships.
- Researchfish Common Question Set, which is self-reported by award holders and collected, online, on an annual basis. This records research outputs generated during the tenure of the award and after the award, collected from 2013 to 2020.
- Researchfish Career Tracker Question set, includes the Your Award questions, with questions relating to the awardee, collected from 2016/2017 to 2020.
- Complete list of AMS Starter Grants for Clinical Lecturers awards, inclusive of grantees' information, collected between 2008 and 2020, provided by AMS.

The data items selected for statistical analysis were gender, region of CL partnership, craft or non-craft specialty, year of award end, whether the CL had previously undertaken a predoctoral ACF, success applying for an AMS Starter Grant and the amount of external funding gained while on the CL award. Amount of funding gained was divided into six ordered categories based on relatively equal proportions within the data (table 1).

Quantitative analysis

First destination progression of awardees after completion of award:

The analysis of the factors influencing successful initial progression after completion of the CL was based on data from the award management monitoring dataset (n=1226), identifying 841 CLs had completed their award by May 2020. For this analysis, the variables, 'progression to become a clinical academic', 'progression to an external research fellowship' and 'progression to an NIHR Fellowship' were aggregated to a new variable, 'clinical academic', as the CLs all maintained some clinical practice alongside their fellowships. The statistical analysis was conducted by statisticians at the Leeds Institute for Health Sciences, Faculty of Medicine and Health at the University of Leeds, who adopted a three-stage process:

First, a univariate analysis was undertaken on the award management monitoring dataset, to describe the demographic/academic characteristics of individuals included in the 'progression after completion' (first destination) dataset.

Second, a sequence of bivariate analyses to examine differences in the above characteristics between groups with different post-CL career progression trajectories were conducted, adding two additional predictors of interest: (1) whether or not the individual was the recipient of an AMS Starter Grant and (2) whether the individual had held a prior role as a ACF. Specifically, the analysis compared those who went on to become clinical academics with those who remained in solely clinical roles, and second, with those whose post-CL career progression was unknown (ie, those CLs whose post completion destination was missing from the award management monitoring dataset). Group differences were examined for statistical significance using Pearson's χ^2 test.

Table 1 Variance across groups

CL post completion—first destination						
Gender		**Clinical only**	**Clinical academic**	**Unknown**	**Total**	**χ2 (df, p value)**
Female	N	89	163	44	296	
	Row %	30.07	55.07	14.86	100.00	
Male	N	178	292	72	542	
	Row %	32.84	53.87	13.28	100.00	
Total	N	267	455	116	838	
	Row %	31.86	54.30	13.84	100.00	0.85 (2, 0.651)
Region		**Clinical only***	**Clinical academic†**	**Unknown‡**	**Total**	**χ2 (df, p value)**
London North Central & East	N	53	79	19	151	
	Row %	35.10	52.32	12.58	100.00	
London North West	N	40	36	19	95	
	Row %	42.11	37.89	20.00	100.00	
London South	N	33	28	17	78	
	Row %	42.31	35.90	21.79	100.00	
South East	N	21	54	2	77	
	Row %	27.27	70.13	2.60	100.00	
South West	N	22	35	14	71	
	Row %	30.99	49.30	19.72	100.00	
East	N	11	52	6	69	
	Row %	15.94	75.36	8.70	100.00	
East Midlands	N	17	26	1	44	
	Row %	38.64	59.09	2.27	100.00	
West Midlands	N	13	46	6	65	
	Row %	20.00	70.77	9.23	100.00	
North East	N	8	25	10	43	
	Row %	18.60	58.14	23.26	100.00	
North West	N	9	39	14	62	
	Row %	14.52	62.90	22.58	100.00	
Yorkshire & The Humber	N	40	35	8	83	
	Row %	48.19	42.17	9.64	100.00	
Total	N	267	455	116	838	
	Row %	31.86	54.30	13.84	100.00	85.7 (20,<0.001)
Craft or non-craft		**Clinical only**	**Clinical academic**	**Unknown**	**Total**	**χ2 (df, p value)**
Craft	N	87	126	30	243	
	Row %	35.80	51.85	12.35	100.00	
Non-craft	N	180	329	86	595	
	Row %	30.25	55.29	14.45	100.00	
Total	N	267	455	116	838	
	Row %	31.86	54.30	13.84	100.00	2.59 (2, 0.273)
Year end		**Clinical only**	**Clinical academic**	**Unknown**	**Total**	**χ2 (df, p value)**
2006–2011	N	33	112	2	147	
	Row %	22.45	76.19	1.36	100.00	
2012–2013	N	47	90	5	142	
	Row %	33.10	63.38	3.52	100.00	

Continued

Table 1 Continued

CL post completion—first destination						
2014–2015	N	66	98	11	175	
	Row %	37.71	56.00	6.29	100.00	
2016–2020	N	121	155	98	374	
	Row %	32.35	41.44	26.20	100.00	
Total	N	267	455	116	838	
	Row %	31.86	54.30	13.84	100.00	46 (6,<0.001)
ACF prior to CL		**Clinical only**	**Clinical academic**	**Unknown**	**Total**	**χ2 (df, p value)**
No previous ACF	N	183	263	70	516	
	Row %	35.47	50.97	13.57	100.00	
Previous ACF	N	51	80	44	75	
	Row %	29.14	45.71	25.14	100.00	
ACF not available	N	33	112	2	147	
	Row %	22.45	76.19	1.36	100.00	
Total	N	267	455	116	838	
	Row %	31.86	54.30	13.84	100.00	55.72 (4,<0.001)
AMS starter grant		**Clinical only**	**Clinical academic**	**Unknown**	**Total**	**χ2 (df, p value)**
Not apply/awarded	N	208	313	86	607	
	Row %	34.27	51.57	14.17	100.00	
Awarded	N	53	142	30	225	
	Row %	23.56	63.11	13.33	100.00	
Total	N	261	455	116	832	
	Row %	31.37	54.69	13.94	100.00	10.39 (2, 0.006)
Funding categories		**Clinical only**	**Clinical academic**	**Unknown**	**Total**	**χ2 (df, p value)**
No funding recorded	N	60	106	25	191	
	Row %	31.41	55.50	13.09	100.00	
£1–£24k	N	22	21	7	50	
	Row %	44.00	42.00	14.00	100.00	
£25–£54k	N	35	58	14	107	
	Row %	32.71	54.21	13.08	100.00	
£55–£299k	N	33	63	20	116	
	Row %	28.45	54.31	17.24	100.00	
£300k–£9m	N	18	79	15	112	
	Row %	16.07	70.54	13.39	100.00	
£10–£27m	N	2	6	1	9	
	Row %	22.22	66.67	11.11	100.00	
Total	N	170	333	82	585	
	Row %	29.06	56.92	14.02	100.00	18.58 (6, 0.046)

*Clinical only includes those doing clinical only, clinical training, consultant, lecturer/consultant.
†Clinical only includes those doing clinical only, clinical training, consultant, lecturer/consultant.
‡The unknown category relates to the unknown post-CL outcome among those who have completed the CL.
ACF, Academic Clinical Fellowship; AMS, Academy of Medical Sciences; CL, clinical lectureship.

Third, associations between post-CL career progression and the characteristics of interest in a multivariate framework were examined, using multinomial logistic regression models to estimate the relative risk of the outcome of interest, that is, becoming a clinical academic, compared with remaining in a solely clinical post. To evaluate the potential for selection bias due to missing outcome data, a series of sensitivity analyses were conducted in which different assumptions about those with missing post-CL career progression data to evaluate the impact on the

estimated associations in our regression models were made. Data from regression models are reported as relative risk ratios (RRR), 95% CI and values of p<0.05 considered statistically significant.

Patient and public involvement

Patients and the public were not involved in the conduct of this study.

RESULTS AND FINDINGS

Award holder demographics

At the time of the study (May 2020), 1,226 medical and dental CLs were funded by the NIHR, with 841 awards completed and 385 active. A total of 1166 CLs were medical (95%) and 60 dental (5%). The gender split of CL award holders was higher for males (63% male n=766 vs 37% female, n=460). CLs span the breadth of General Medical Council clinical specialties, awarded to 64 of 65 recognised specialties with 374 (31%) in craft specialties (see online supplemental file 4). Fifty-three per cent of award holders were based in London, Oxford and Cambridge partnerships (n=655), with 37% (n=457) of all awardees based in London. However, there has been some indication of a gradual wider geographical dispersal of awards over time, for example, there were only 35% (n=33) of awardees based in the 'Golden Triangle'[21] (Oxford, Cambridge, Imperial, King's and UCL) in 2019, compared with 57% (n=53) in 2006/07.

What is the experience of CL awardees?

Motivation and achievement of CL

The majority of those who had completed their CL, reported their primary motivation for undertaking a CL as being 'to pursue or continue a combined academic/clinical career' (figure 1). Overall, 62% (n=131) of CLs felt that they had achieved their primary motivation to a 'great extent'.

Award experience

The 40 interviews conducted with CLs, alongside self-reported data from Researchfish, provide valuable qualitative data around the award holder experience. Of the 599 CLs initially contacted by NIHR, 75 awardees chose to opt-in to receive further contact from the external agency to arrange an interview. This did limit the ability to meet certain participant minimum quotas (figure 2), notably for craft specialties, dental and gender groups.

When we compare the interview sample to the demographic and contextual make-up of the complete CL cohort dataset of 1226, the proportions were generally in line, with the exceptions being, the number of those progressing to a clinical-only role, number of dental CLs and numbers by geographical partnership region. Also, those whose award ended earlier than 2015 were not chosen to be interviewed, due to issues of recollection. There was some disparity for the regional partnership group in particular, with the East of England the most notably under-represented as it had no interviewees. Nonetheless, it was felt that in general, a reasonable geographical distribution was achieved, with no one region or area of the country being dominant and that the overall recruited sample of 40 was representative enough to provide the necessary depth of insight.

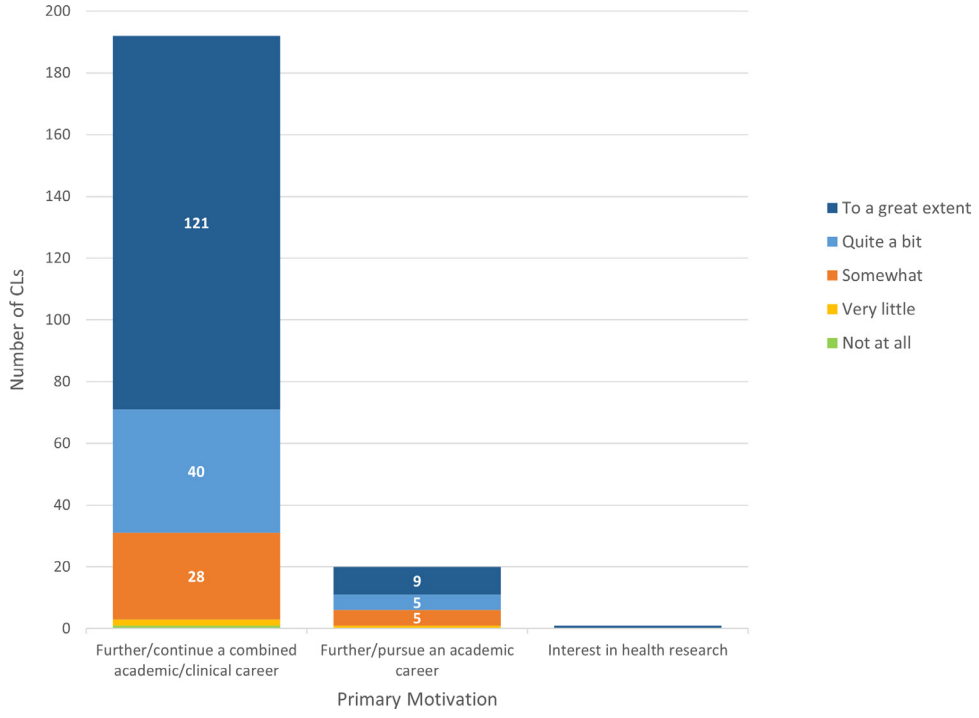

Figure 1 Primary motivation by extent motivation achieved. NIHR Clinical Lectureship (CL).

	Medical					
	Still Active		Completed Award•			
			Craft		Non-Craft	
	Craft	Non-Craft	Clinical only	Clinical Academic or other Award/Fellowship	Clinical only	Clinical Academic or other Award/Fellowship
Target	7 (min.)	7 (min.)	5 (min.)	5 (min.)	5 (min.)	5 (min.)
Achieved	5	16	1	4	4	8

	Dental (Active and Completed)
Target	6 (min.)
Achieved	2

	Other primary selection criteria	
	GP	Gender - Female
Target	5 (min.)	20 - 50% (min.)
Achieved	6	16

	AMS Starter Grant
Target	10 (min.)
Achieved	14

Secondary criteria	**Secondary criteria considerations**
Target	Previous ACF (min. 10)
Achieved	14
Target	Geography - National Spread
Achieved	25/40 - Non-South East or London

Figure 2 Interview sample—achieved and unachieved sample quotas. GP, General Practitioner.

Enablers of success

Having protected time was regarded as the most important benefit of the award (27%, n=57), with this percentage rising to 41%, 'if time for a specific purpose' was included (14%, n=30).

> The key bit is giving you 50% protected academic time, and that just gives you time to do research basically. I think without that you'd end up really stuck, because during that period when you need to be able to generate extra pilot data or bring in more funding to show that you're ready for the next stage, but without any time to do it, would be impossible to do. So, it's that protected academic time that's been the key. (Interview 2, Active CL)

> The best part has been the protected time, that's been really good. I really missed having the research time. It's just that brain space to think through stuff and to try stuff. (Interview 6, Active CL)

A number of other benefits to the award were identified, with key emergent themes relating to:

The 'inbuilt' flexibility of the award:

> Flexibility for me is vital. I think we need to finally realise that different people are different, and it is amazing that the NIHR does understand diversity in the way that it does…diversity isn't just about being female, or male or non-binary or whatever. It's also about the life decision that you make in terms of your workload, in terms of your personal life. (Interview 25, Completed CL)

> It was the flexibility to allow me sufficient time to finish my training, but also keep the momentum up in the lab. So that that piece was quite useful, and at the beginning there was flexibility in terms of how you set up the week, flexibility in terms of how you set up the award, whether you took the full four years or three years depending on how much training you needed, and I think both of those aspects we're really useful for me and I think that's really important from my perspective. (Interview 39, Completed CL)

The perceived effect of having an NIHR award on research curriculum vitae and career progression:

> Obviously without the NIHR clinical lecturer job, progressing as rapidly into a tenured sort of academic position within a European university would have not been possible. (Interview 46, Completed CL)

> It never hurts to have a CL on your CV right, because it shows that you have some academic credentials. (Interview 15, Active CL)

The opportunities for research and leadership skills development, opportunities for mentorship, collaboration and networking:

In addition to covering salary costs, the CLs benefit from personal development training including mentorship and leadership schemes. CLs accessed mentorship through their institution (48%, n=71) or through the AMS mentorship scheme (47%, n=70). CLs undertook leadership training courses at their own institution (39%, n=56), other institutions (45%, n=65) or through the NIHR Leadership and Support Development Programme (15%, n=21). Both mentorship and leadership programmes were highly praised by those interviewed:

> I also have joined the mentoring scheme, I'm pretty sure it's person specific but I've just got this absolutely fantastic mentor. It's actually been a really amazing moment to have someone absolutely external. I've never really needed that because I've got loads of really excellent mentors that I've developed myself over the years for different things, I go to different people. But this mentor just came into my life at this time of huge career upheaval and really being able to have someone as a sounding board about sensible and non-sensible next career moves while I'm negotiating my senior lecturer post has been really helpful. (Interview 33, Active CL)

> NIHR has been great for that as well because it's got a Leadership Academy so, it helps you on the journey as you grow with it, and you need a different kind of set of skills for that as well. It's been good. (Interview 31, Active CL)

> We have a number of residential sessions where you were away and it was dedicated time to focus on leadership, and to just take that breather and pause and reflect and everything, but it was really relevant. The people that I met were doing similar work of different levels across the country, so you were actually on a course, which was with people who were in a similar position, which is often quite tricky. I think that it was really strong. It really helped with confidence. (Interview 27, Completed CL)

There was general satisfaction with the model and structure of the award, with the 50/50 split of academic and clinical activity regarded as being the correct balance. The flexibility to self-manage working patterns for both activities was highly appreciated and the time given to undertake research was considered to be sufficient:

> I think the 50/50 split is probably about right. I think it's helpful if there's a little bit of flexibility about how much is taken at different points in the journey, because you might be on a particular job, which requires more clinical time and other parts of the job where perhaps you can afford to spend more time on the academic aspects. (Interview 44, Active CL)

Challenges to success during the tenure of the award

Despite general satisfaction with the award, it is clear that there were a number of challenges experienced by awardees, with the most emergent themes in this area relating to time pressure and balancing clinical and academic responsibilities. Issues tended to relate to anxieties around meeting the expectations of colleagues on the clinical side of the partnership and also making sufficient progress towards the Certificate of Completion of Training (CCT) within the award time, where appropriate. When asked what the greatest challenge was in completing their NIHR Award, 37% (n=113) reported 'balancing clinical/academic commitments' as the greatest concern, rising to 49% (n=139) when codes for 'time management' and 'ensuring protected time' were included. Thirty-two of the 40 (80%) interviewed reported this as an issue. For some, this manifested itself through tensions around fully accessing their protected research time; 92% (n=194) of awardees stated that their academic time was 'mostly protected', but this fell to just 53% (n=112) for 'fully protected'.

> That's tough, because you're essentially doing two jobs…they never quite make one full-time equivalent job. So, you often find you're probably working longer hours than some of your colleagues who are doing one or the other full-time. Something I have seen with a lot of clinical academics is that their working hours are typically longer than those who are working full-time in research for those who are working full-time in clinical practice. (Interview 29, Completed CL)

> There is always that conflict between clinical and academic time because you're forever pulled towards the clinical part of the job because that's the bit that always needs cover, and that would be a conflict. (Interview 3, Completed CL)

> Obviously it was a little bit stressful because you would have less time to acquire the competencies if you were to finish on time. (Interview 46, Completed CL)

Some awardees showed acceptance of the time pressure and stress on the award:

> I'm not sure there's a satisfactory way around that, I think it's just an inevitable aspect of working two jobs with different skill sets. (Interview 29, Completed CL)

> For however much you try and solve it because there's only X number of people in the department at any one time and if one or two of them are clinical lecturers (Interview 3, Completed CL)

> …. and in some sense that's the life you choose when you want to be a clinical academic, because you have to deliver at a sufficient level. (Interview 39, Completed CL)

However, time pressure and balancing clinical and academic responsibilities clearly impacted on some CL's work/life balance, notably those with childcare responsibilities:

> Yes. It is very much annual leave and evenings, once you have children, weekends kind of need to be like; the children deserve people to be around, I can't ignore them. (Interview 32, Active CL)
>
> So I think and then balancing all with you know small children and things like that I think like having two jobs like one job and small children probably is a great challenge" (Interview 34, Active CL)
>
> If you are a mum and you do two jobs it is always going to take longer and that is the way it is, it has always been my approach but obviously now it is just not working. (Interview 10, Active CL)

However, there was acknowledgement that the flexibility that NIHR has 'built in' to the CL has been helpful, particularly for those CLs having children or with childcare responsibilities:

> NIHR were quite good in that they do not question any prolongation of maternity leave that is required. They were very supportive about me wanting to prolong my maternity leave, I then wanted to go back less than full time and they immediately approved that. (Interview 36, Active CL)
>
> I think that NIHR was one of the better funders out there. They were certainly better than the deanery who even went as far as to, if my child was two weeks in hospital and I took two weeks off, they would add those two weeks to the end of my completion of specialist training. It was that petty, but NIHR were fine and if I came back to the UK, I would want to apply for another NIHR award for that reason. (Interview 46, Active CL)

It was noted that some of those undertaking a craft specialty perceived an additional clinical training burden associated with the additional hours required to learn necessary skills and procedures, leading to increased pressure in balancing the clinical and academic aspects of their award:

> I can only postulate, but I suspect it would be easier for physicians because they don't have that need to learn a craft specialty. So not having to learn something that requires x number of hours, the pressure is off them. (Interview 38, Completed CL)
>
> It has been incredibly challenging, because paeds cardiology is quite a practical speciality, so I don't think I would have wanted to speed up the clinical training. I think I would have missed out on too much… at the moment for the last 6 months I am actually counting my 50% full time, because I am now doing cardiac MRI which is what I do for research. The clinical demand, the amount of reports you have to write in order to get all your clinical qualification at the end, I am working every weekend in order to get both in. (Interview 10, Active CL)

There were three other subthemes relating to challenges on the award that were emergent from the interviews:

Concerns around sourcing research funding within the award:

While most award holders were able to access grants in time to start the research on their award, this was a particular issue for those who found themselves 'wasting' valuable research time trying to gain relatively small amounts of funding from several sources, a situation which can be exacerbated if a CL's specialty is in an area where funding is under pressure or has historically been lower:

> I think it's really hard to get up and running to do a very focused project in the way that they fund… so, you've got to apply for one of these CL grants, and it's got to be super focused, and the amount of money is not huge. (Interview 1, Active CL)
>
> You need research costs to pay for data to pay for other staff time…… I've applied for quite a lot of grants; I think I've applied for about 12 and got 7. But then the ones that I got were smaller grants. (Interview 26, Completed CL)

A perceived lack of pay parity with clinical-only colleagues:

CLs understood that pursuing a clinical academic career came at a financial cost to them, in comparison to their clinical-only colleagues[2]:

> Financially, the way that our salary and pay works is that we have a basic salary and then we get a significant uplift in our salary based on when we're doing on-call and out of hours work in clinical jobs, and when you're doing your research time, you don't have that, so, my salary when I am doing clinical work and when I'm doing research work changes and fluctuates, and it's a bit more challenging because the research salary that I'm on is significantly lower than when I'm doing clinical placement, so that brings in challenges (Interview 14, Active CL)
>
> You obviously have a huge loss of salary compared to your peers who are moving through the system more quickly. (Interview 46, Completed CL)
>
> So, obviously it delays your clinical progression because you're taking time where you're doing research where you're not getting your clinical training, so had it not been for doing this CL, I would already have qualified and finished my clinical training and I'd be a consultant; that's one of the downsides. (Interview 14, Active CL)

Inadequate support and guidance in partnerships:

For most CLs, the award was considered to be effectively managed by host partnerships, with access to good support and guidance when required. However, for a minority who did not receive satisfactory support, it could be a major concern. There appeared to be some inconsistency in the quality of support provided at institutional and department

levels with poor support often seen by CLs as an issue of administrative underperformance or incorrect interpretation of award processes within the partnerships:

> I suppose if people knew more clearly; I think the problem is there hasn't been another person like me here before and I'm the first person in the role in this department with an NIHR award. There have been other NIHR academic clinical fellows, but they have been in a different stage in their clinical training. (Interview 14, Active CL)

> I just think that the support varies from person to person, and I don't see how because of the current situation, how my department will be able to ensure there is a lot of equal support across the board. (Interview 6, Active CL)

> And the second thing is the fact that the NIHR can do a bit more in terms of holding institutions accountable, when they do not offer a similar degree of support to the funder. (Interview 25, Completed CL)

Where are clinical lecturers progressing to after completing the award (postaward)

Of those who had completed their award by May 2020, just over half were involved in research-focussed roles within a year of completion, with most progressing to a clinical academic role/position, but a notable minority progressing to external or NIHR fellowships (figure 3). Just under a third had returned to a clinical only role and just over a tenth having an unknown destination. Of those returning to clinical-only, 38% (n=101) were returning to complete their clinical training, with progression to a research-focused position remaining a possibility in the future.

> Please note: Categories in the core IAT dataset: Clinical Academic, External Research Fellowship and NIHR Award are combined into one category, 'Clinical Academic' for analysis in this study, as all fall under clinical academic roles

The interviews showed that of those returning to clinical-only roles who had completed training, some had returned temporarily while applying for their next fellowship and/or funding grant, while others appear to have reluctantly returned, either because of perceived difficulties in progressing further in a clinical academic role or they now considered a clinical only role as a more secure career option:

Figure 3 First destinations, post CL completion.

I had projects and grant applications but unfortunately the pandemic struck so I was redeployed full-time clinical in the final six months of my lectureship as a consultant. And then I moved on with the NHS in a substantive consultant post thereafter in Oxford. That's my current job, and I've been a full-time consultant for the last over a year now in the substantive post. (Interview 8, Completed CL)

Because in all honesty there is a real chance I won't come back, right because 18 months in clinical, you get stuck in the clinical role, you stop all your research. They will give you a clinical post, it is a full time post compared to a 5 year fellowship, you have got your job security. Are you really going to give all that up? I don't know. (Interview 10, Active CL)

Juggling the constant pull back to the NHS, it's much easier in the NHS…it's much easier to know where you're at and to know that you're achieving and to not feel like you're failing and to not have to worry about the next milestone or whatever. I think there's the constant pull and the easy option that's always there. (Interview 27, Completed CL)

I think the greatest challenge was to determine what I wanted to do next and it was constantly ticking around my mind. Was I going to go down a clinician scientist route or was I going to go down a more clinical route? And what I really wanted to achieve was a 50/50 job where I would do an academic job half the week and then a clinical job the other half. But I soon realised after exploring that and speaking to a couple of people that had actually managed to achieve something like that, that it really wasn't going to be feasible and it really wasn't going to fit with any form of life, because you would always be expected to perform and compete against clinician scientists who are eighty percent of their time lecturers and academics. But also, if you were there fifty percent of the time, your workload from clinical was going to incorporate most of your week and creep into your academic time. I felt in the end that it was just going to lead to a lifetime of stress. (Interview 21, Active CL)

What factors are associated with a CL attaining a clinical academic role as their first destination post completion of the award

A sensitivity analysis was undertaken due to the relatively high proportion of 'unknowns' in the post-CL-career progression variable; whereby 'unknowns' were removed from the model and covariates compared with original model outputs. Removing the unknown values was found to have no apparent effect on the results. Please see online supplemental file 5 for full details of this analysis.

A number of statistically significant predictors supported first destination post completion progression to a clinical academic role (table 2). Using multinomial logistic regression modelling, CLs were more likely to progress to a clinical academic career if they were based in a West Midlands (OR 5.67 (95% CI 2.00 to 16.03) p=0.001) or East of England (2.71 (95% CI 1.06 to 6.94), p=0.04) host partnership (table 2).

Compared with CLs who completed their award between 2006 and 2011, for awardees completing after 2011 there was a year-on-year increase in the odds of not progressing to a clinical academic career; 44% (95% CI 5% to 66%) in 2012–2013, 56% (95% CI 22% to 73%) 2014–2015, 62% (95% CI 40% to 76%) 2016–2020.

Those who gained further funding of value between £300k and £9m (2.31 (95% CI 1.17 to 4.58), p 0.016), were 2.3 times more likely to progress to a clinical academic role than CLs with no funding recorded. There was no significant difference between other funding ranges.

Awardees who gained an AMS Starter Grant were twice as likely to report a clinical academic first destination compared with those without an AMS Starter Grant (2.01 (95% CI 1.15 to 3.53), p<0.01).

Gender, craft/non-craft specialty and previous ACF were not associated with progression to a first destination clinical academic role.

The role of the AMS Starter Grant in the CL award

AMS starter grants support, on average, 45 CLs per annum (including CLs funded by institutions, which were not included in this study).[22] Up to May 2020, 26% (n=315) of all NIHR CLs had benefited from an AMS Starter Grant, with a 49% (n=117) success rate over the last 4 years (data only available for 2016 onwards).

For the large majority of successful awardees, the experience of having a starter grant was very positive. While receiving the funds to spend on research activity (typically around £30k) is valuable, one aspect that appeared to make a real difference was having early access to this funding in order to begin research on time; generally at the start of the award:

I couldn't have done anything, especially MRI's consumables are expensive, and I wouldn't have been able to do anything, it was crucially important (Interview 10, Active CL)

That was fantastic, it enabled me to actually get on and do the research, and without it I wouldn't have been able to do that. (Interview 31, Active CL)

Another benefit was the idea of 'success begets success', that is, a successful AMS application leading to success in making further funding applications. Similarly to the CL award, an AMS Starter Grant was considered to be prestigious and helpful for an award holder's curriculum vitae. Having an AMS Starter Grant was perceived to offer reassurance to potential funders. 68% (n=166) of those who gained an AMS grant (of those submitting in Researchfish) were able to secure one or more other types of funding to support research within their award period:

….and it gave me the chance to get the grant. It's the first time you get a grant in your name

Table 2 Predictors of post-CL first destination progression

		Unadjusted estimates				Mutually adjusted estimates		
		RRR	95% CI		P value	RRR	95% CI	P value
Clinical only	(Base outcome)							
Clinical academic	Female	1.00				1.00		.
	Male	0.90	0.65	1.23	0.50	0.73	0.47 to 1.13	0.15
	London North Central & East	1.00				1.00		
	London North West	0.61	0.34	1.07	0.08	0.63	0.29 to 13.8	0.25
	London South	0.57	0.31	1.05	0.07	0.81	0.36 to 1.18	0.61
	South East	1.73	0.94	3.18	0.08	1.70	0.77 to 3.76	0.19
	South West	1.07	0.56	2.02	0.84	1.20	0.53 to 2.71	0.66
	East	**3.17**	**1.52**	**6.63**	**0.002**	**2.71**	**1.06 to 6.94**	**0.04**
	East Midlands	1.03	0.51	2.07	0.94	0.91	0.36 to 2.25	0.83
	West Midlands	**2.37**	**1.17**	**4.81**	**0.02**	**5.67**	**2.00 to 16.03**	**0.001**
	North East	2.10	0.88	5.00	0.09	2.26	0.78 to 6.51	0.13
	North West	**2.91**	**1.3**	**6.50**	**0.01**	2.68	0.97 to 7.43	0.06
	Yorkshire & The Humber	0.59	0.33	1.04	0.07	0.89	0.42 to 1.89	0.77
	Craft	1.00				1.00		
	Non-craft	1.26	0.91	1.75	0.16	1.36	0.86 to 2.14	0.19
	Year end 2006–2011	1.00				1.00		
	Year end 2012–2013	**0.56**	**0.33**	**0.95**	**0.03**	**0.13**	**0.03 to 0.62**	**0.01**
	Year end 2014–2015	**0.44**	**0.27**	**0.72**	**0.001**	**0.07**	**0.01 to 0.29**	**<0.001**
	Year end 2016–2020	**0.38**	**0.24**	**0.6**	**<0.001**	**0.05**	**0.01 to 0.21**	**<0.001**
	No previous ACF	1.00				1.00		
	Previous ACF	1.09	0.73	1.63	0.67	1.34	0.82 to 2.21	0.24
	ACF not available	**2.36**	**1.53**	**3.34**	**<0.001**	omitted		
	AMS not awarded	1.00				1.00		
	AMS awarded	**1.79**	**1.25**	**2.56**	**0.001**	**2.01**	**1.15 to 3.53**	**0.01**
	No funding recorded	1.00				1.00		
	£1–£24k	0.54	0.27	1.06	0.07	0.56	0.27 to 1.19	0.13
	£25–£54K	0.94	0.55	1.59	0.81	0.65	0.32 to 1.33	0.24
	£55–£299k	1.08	0.64	1.83	0.77	1.14	0.61 to 2.1	0.68
	£300 k–£9m	**2.48**	**1.36**	**4.54**	**0.003**	**2.31**	**1.17 to 4.58**	**0.016**
	£10–£27 m	1.70	0.33	8.68	0.52	2.05	0.37 to 11.35	0.41
Progression Unknown	Female	1.00				1.00		
	Male	0.82	0.52	1.29	0.39	0.60	0.33 to 1.09	0.09
	London North Central & East	1.00				1.00		
	London North West	1.32	0.62	2.82	0.47	0.92	0.36 to 2.6	0.87
	London South	1.44	0.66	3.15	0.37	0.90	0.32 to 2.56	0.85
	South East	0.27	0.06	1.24	0.09	0.21	0.04 to 1.06	0.06
	South West	1.78	0.76	4.16	0.19	1.09	0.39 to 3.05	0.86
	East	1.52	0.49	4.68	0.46	0.93	0.25 to 3.47	0.92
	East Midlands	0.16	0.02	1.32	0.09	0.12	0.01 to 1.05	0.06
	West Midlands	1.29	0.43	3.87	0.65	2.16	0.53 to 87	0.28
	North East	3.49	1.20	10.14	0.02	2.29	0.62 to 8.53	0.22
	North West	**4.34**	**1.62**	**11.65**	**0.004**	2.17	0.6 to 7.87	0.24
	Yorkshire & The Humber	0.56	0.22	1.41	0.21	**0.22**	**0.06 to 0.76**	**0.017**
	Craft	1.00				1.00		

Continued

Table 2 Continued

	Unadjusted estimates				Mutually adjusted estimates		
	RRR	95% CI		P value	RRR	95% CI	P value
Non-craft	1.39	0.85	2.26	0.19	0.98	0.52 to 1.83	0.94
Year end 2006–2011	1.00				1.00		
Year end 2012–2013	1.76	0.32	9.60	0.52			
Year end 2014–2015	2.75	0.58	13.13	0.20			
Year end 2016–2020	**13.36**	**3.13**	**57.08**	**<0.001**			
No previous ACF	1.00				1.00		
Previous ACF	**2.25**	**1.38**	**3.76**	**0.001**	**2.03**	**1.1 to 3.77**	**0.02**
ACF not available	**0.16**	**0.04**	**0.67**	**0.012**	omitted		
AMS not awarded	1.00				1.00		
AMS awarded	1.38	0.82	2.30	0.22	1.55	0.73 to 3.3	0.26
No funding recorded	1.00				1.00	.	.
£1–£24k	0.76	0.29	2.01	0.59	0.50	0.18 to 1.42	0.21
£25–£54K	0.96	0.44	2.09	0.92	0.58	0.22 to 1.54	0.28
£55–299k	1.45	0.71	3.00	0.31	1.04	0.45 to 2.42	0.92
£300k–£9m	2.00	0.87	4.58	0.10	1.23	0.48 to 3.15	0.67
£10–£27m	1.2	0.11	13.84	0.88	1.14	0.08 to 15.53	0.92

Unadjusted estimates are estimates produced using a multinomial logistic regression model and univariate models N=838, except funding total n=583.
Mutually adjusted estimates are estimates produced using a multinomial logistic regression model and mutually adjusted modes n=583.
P value is for the RRR.
Estimates for year end predicting 'unknown' post-CL progression category could not be calculated due to small numbers.
Unadjusted and mutually adjusted effect estimates.
Bold values indicate those rows with P values of <0.05 and considered statistically significant.
ACF, Academic Clinical Fellowship; AMS, Academy of Medical Sciences; RRR, relative risk ratio.

> for a project that you want to do. So, you've got some ownership over the project. (Interview 3, Completed CL)

Related to this, some awardees stated that getting an AMS Starter Grant provided a psychological benefit, increasing their motivation and confidence while on their award. Conversely, some of those who were unsuccessful described a loss of confidence and were worried that their curriculum vitae would be damaged by not having gained the grant:

> There is quite a level of prestige attached to them. When I contacted other people as an (AMS) starter grant holder they took me more seriously as well, which was very helpful. (Interview 7, Active CL)

> I think it will have an impact actually, it is a shame. It will definitely have a negative impact because those awards are for clinical lecturer starter grants and I didn't get one. (Interview 32, Active CL)

> It would have been a nice entry in my CV, it would have demonstrated that I can win the grant that every lecturer in the country is expected to go for and compete on the same footing. (Interview 8, Completed CL)

The data suggest that in recent years (2016 onwards) over half of awardees had not applied for an AMS Starter Grant, with insight from interviews suggesting that many CLs had identified other, larger funding awards for their research. Non-AMS funding CLs were successful in applying for included: Other NIHR funding (n=73), Medical Research Council funding (n=46), including nine instances of the 'Confidence in Concept Award', Wellcome Trust (n=43), including 13 instances of the Institutional Strategic Support Fund and Cancer Research UK (n=18). 41% (n=312) reported gaining less than £25k funding for research within their award.

'Cliff edge': progression opportunities

One major emergent theme in the interviews was the level of CL anxiety around clinical academic progression after completion of the award. The expression 'cliff edge' was mentioned by a number of those interviewed. Concern was expressed about a scarcity of available posts and fierce competition at the next stage of the postdoctoral pathway, insufficient guidance to navigate the next step, and a lack of supported time to put together strong applications. It was noted that there is no expectation on institutions to commit to maintaining employment of CLs

on completion of their award, which some CLs felt was unfair:

> It's quite unsettling to be told that there's this pyramid shape and expected to fall off back into the NHS or into industry or other roles as you go up. And it doesn't really fit with the idea of a stream that's supposed to be shepherding people towards senior positions. (Interview 13, Completed CL)

> It cuts off after that time because the clinical lectureship is tied into your training, as soon as you've finished clinical training that's a watershed moment and if you haven't got funding secure beyond that point, that's it, the salary goes, you've got no time to do research, and that's probably why there's quite a big attrition of researchers (Interview 2, Active CL)

> …but I applied for an Advanced Fellowship and got to the final interview stage, but then didn't get it. And the competition ratios…less than 10% get them. So, it's like what do I do next with my career? My contract ends in a few months' time, and I don't have any further funding at the moment. I think the CL posts are great, but I think there needs to be something after that for people on that career track. (Interview 26, Completed CL)

> I think there is a real cliff edge effect at the moment, and I know quite a few people that have left this sort of area or not left completely but gone into other roles like teaching or policy. In fact, I'm struggling to think of people that have managed to get past the transition onto the next stage. (Interview 26, Completed CL)

> If I were in the NIHR I think I would look at the model because you fund the salaries for free for these very powerful elite institutions, who then offer zero commitment afterwards. So you pay for them to be there for three or four years, when the money runs out you just get an email saying clear your desk next Monday, thanks for the fish. (Interview 15, Active CL)

The general anxiety around clinical academic progression does appear to have been exacerbated by the COVID-19 situation, with a perception, in the interviews, that significant funding allocation had been diverted to COVID-19-related research activities, and that there was likely to be a potential increase of applicants for future awards, due to people holding back their funding applications over the COVID-19 lockdown period:

> And I know that the charities have certainly been hit by COVID, and I know that the pools of funding are lower. I know that because there's been missed grant rounds, there's more competition within them, and I felt that this would really impact my ability to get the next grant stages in my career as a clinician scientist. So, along with other factors, I felt that COVID-19 will impact the funding environment for the years to come and it would make it incredibly competitive. (Interview 21, Active CL)

DISCUSSION

Principal findings

The CL award is well regarded by awardees and the majority reported that they had achieved their primary motivation for undertaking it; a finding in line with the views reported across NIHR Academy award holders (Researchfish Career Tracker—2020 dataset). Only a small minority (2%) of CLs reported that they have gained little or nothing from the award. The key aim of the award is to strengthen the clinical academic pathway and 54% of all CLs did progress to a clinical academic role on completion of their CL award. However, this figure might be an underestimate, first as interview data showed that some CLs returned to clinical-only roles temporarily either to apply for new funding or to complete their clinical training, and second because 14% of all destinations were unknown. However, the interviews did highlight a subgroup that reluctantly returned to permanent clinical-only roles. The regression analysis undertaken provided an understanding of the factors associated with clinical academic progression, with these being the region where the CL was undertaken, the year of award end, being in receipt of an AMS Starter grant and the value of funding gained on the award.

Strengths and limitations

There were a number of strengths and limitations of the study, in part, associated with using different methodological approaches and several different datasets. On the positive side, having access to a comprehensive dataset of all CLs (n=1226) from the start of the award in 2006 for quantitative analysis relating to progression, access to the Researchfish career tracker questions relating to award holder experience, and an interview cohort of 40 CLs for qualitative analysis looking at the award holder experience, has allowed the use of a data triangulation approach to strengthen findings in the study. Also, having the interviews conducted by researchers independent of the NIHR allowed those completing or who have completed a CL to speak freely about their experiences and perceptions. However, we acknowledge that a number of authors on this manuscript are associated with NIHR, including the lead author who undertook the analysis of the interview transcripts, and so a reflexivity statement is included as online supplemental file 3 to this manuscript.

However, there have been challenges in undertaking the research, including the complexity of analysing a variety of datasets, with different starting points and different population sizes making the drawing of comparisons between different elements of the analysis more

complicated. An additional shortcoming of this research is the limited number of interviews that were conducted with dentists who have been awarded a CL, as well as medical trainees from craft specialties, whose additional clinical training burden was highlighted in interviews that were conducted, but could be more fully elucidated.

There were also the limitations of using Researchfish data—which is self-reported data—in terms of the reliability and completeness of the dataset. Also, it has not been possible to provide analysis of protected characteristics data, as only gender data is currently collected by Higher Education England local offices through the host partnerships. Finally, this study is limited to those who were successfully awarded a CL due to a lack of available application data.

Implications of the findings

The CL award experience

Despite the perceived benefits of protected research time many trainees expressed concern about the pressures of achieving all their clinical and academic competencies within the restricted time frame without having to prolong their clinical training. A key aspect of the CL is that it guarantees 50% protected time for research activities, but only 53% reported their research time on their award as being fully protected. It is clear that many CLs feel time demand pressure from the clinical side of their partnership, both in terms of supporting their clinical team and also in gaining their CCT. This is not unique to this stage of the pathway, it echoes the experiences of many clinical academics in the early stages of the clinical academic pathway from predoctoral level to early postdoctoral, both in the UK and internationally.[10 23 24] There was a desire in the interviews for the NIHR to become more involved in ensuring that partnerships meet their obligations around ensuring protected research time.

Concerns around gaining research funding on the award were raised by some CLs whose research was delayed due to not having the necessary funding in place from the start. This has implications in terms of the quality and quantity of research outputs (leading to impact) generated in their designated 2 years of research time. Some awardees suggested that some research funding could be made available from the start of the award, without the need to apply for it.

Generally, the support and guidance offered by the IAT partnerships seemed to be regarded highly, however, some inconsistency was identified at both institution and department levels, which is a concern. Other studies have highlighted the necessity of having good support processes to enable successful outcomes on clinical academic awards.[7 16 25]

When the above challenges are considered together, there is notable agreement with a number of previous studies both UK and international that highlight the influence of factors such as work/life balance, mentorship, availability of funding and support on award success.[7 10 12 24 26] The 2018 NIHR Strategic Review of Training[27] has already acknowledged and sought to address a number of the barriers relating to clinical academic progression, for example, offering greater flexibility in the training model (part time, maternity support, extension beyond CCT), providing a clearer route of entry to the award, and increasing mentorship availability. However, as evidenced by this study, there are still some concerns relating to time pressure and career progression. Nevertheless, taking all of the above into account, it is apparent that most CLs accept that undertaking a clinical academic career is not an 'easy option' and that they could be financially better off, work fewer hours and have greater job security, if they stayed on the clinical only training path. Most CLs undertake the award because of their passion for research and are prepared to make sacrifices to pursue this path.

Progression after the award (first destination)

Despite over half of all CLs progressing to a clinical academic role on completion of their award, of the CLs that immediately returned to clinical roles, the interviews highlighted a group who returned to a clinical-only role permanently. One aspect of this challenge around clinical academic progression related to anxiety about future funding. This concern has previously been identified at earlier points on the clinical academic career pathway, with 'difficulty obtaining research grants' considered the main barrier to award success for ACFs.[24 27] CLs perceive increasingly higher levels of competition for clinical academic roles acting as a barrier to progression and the Medical Schools' Council clinical academic workforce survey has shown that between 2006 and 2021 there was an 84% increase in CLs employed by universities but a reduction of 5% in senior clinical academic positions, which does, in part, support this view.[28] The Advanced Fellowship offered by NIHR Academy is not the only progression option for those completing a CL, as there are other funding opportunities available outside of the NIHR, but it is an obvious next step for many of those completing their CL award. The competition rates for postdoctoral fellowship, from NIHR, charities and other funders is similar for clinical and non-clinical applicants at 10%–20%[29] highlighting the competitive nature of academic careers. Therefore, it would appear that while the 'supply' of fellowship opportunities has remained at a relative constant, the 'demand' for these opportunities has increased over time, as the number of non-clinical applicants competing for these awards has grown in line with the expansion of provision of competitive postdoctoral awards for non-clinicians. This would explain why progression to clinical academic roles was identified in the regression analysis, as being higher for the early 2006 to 2011 cohort of NIHR Clinical Lecturers than for subsequent groups.

Factors associated with clinical academic progression

Four factors were associated with clinical academic progression, post completion of the CL. There was

significant variation between partnership regions in the regression analysis, with progression to clinical academic roles significantly higher in the West Midlands and the East of England than in other regions. Those who completed their CL award after 2011 were less likely to progress to a clinical academic first destination than those whose award was pre-2012. Furthermore, over the years, there has been a continuing decrease in the likeliness of progression. This cannot be explained by the withdrawal of the DHSC 'new blood' clinical senior lecturer scheme,[14] which funded 200 new senior clinical lecturers for 5 years, and which had its final round in 2011/2012, as might be expected, as very few CLs recorded this as a first post-completion destination. The main decline in those progressing to external fellowships was seen after 2014. The interviews suggest that the association with gaining an AMS Starter Grant is related to aspects of the award such as earlier access to research funding, confidence gained in applying for funds, access to a peer network and the prestige of having the AMS grant on your CV rather than the amount of funding received, which through testing showed no correlation to first destination clinical academic role. The last factor, gaining between £300k and £9M in research funding appears to be associated with larger clinical trials and research projects for which the CL was not the lead applicant. This could be connected to increased career security and experience gained due to being involved (coinvestigator) in larger, longer-term studies, which in turn might be connected to belonging to a department in which this kind of involvement is facilitated. Further research would be required to fully understand what is occurring in this area.

Factors not associated with clinical academic progression

Three of the factors considered in this study had no association with first destination clinical academic progression: gender, craft/non craft specialty and previous ACF. For gender, it was noted in Mulvey *et al* that the success rate for NIHR Academy training awards did not differ between genders, but that as award seniority increased, the proportion of applications from female candidates reduced.[29] In the present study, the CL gender split broadly represents the current national gender split of new consultants.[28] Nonetheless, this study does highlight particular challenges faced by female CL holders, mirrored to some extent in other literature in this area.[12 13] Measures put in place by NIHR, such as being able to undertake the CL part time and the introduction of the post CCT extension (which allows more flexibility and time to continue academic aspirations and development time), while not specifically targeted at females, have helped to mitigate against further disproportionately lower progression rates for females on the clinical academic pathway, on completion of the CL award. Nevertheless, it is important that the NIHR Academy, through ongoing qualitative interaction with CLs, continues to monitor this carefully, particularly, in the context of COVID-19, which may have acted to increase the pressure on female clinical academics, as highlighted by Finn *et al*.[5]

While there is no statistical association between craft specialty and lower progression to further clinical academic roles, there was a clear theme reported by CLs of additional challenges experienced by those undertaking a craft specialty; particularly associated with the hours required to develop the practical skills for a particular specialty and hinting at a less accommodating clinical culture compared with non-craft specialties. This issue was identified as far back as 2004 by Pusey and Thakker,[7] and in 2005 in the MRC/UKRI report.[1] However, craft CLs are progressing to clinical academic roles at the same level as their non-craft counterparts.

The primary aim of the ACF is to support progression to PhD level, not directly to CL (early postdoctoral) level, therefore, having predoctoral experience as a clinical academic might have less of an impact on a CL progressing to further clinical academic roles. The interviews suggest that progression to a senior postdoctoral clinical academic position after the CL is more likely to be driven by the research activity undertaken at doctoral and CL award level, than training at predoctoral level.

Challenges of a clinical academic career

Throughout this manuscript, many of the challenges that are presented within a clinical academic career have been highlighted, and the research presented here on the experience of the CL award demonstrates that the CL is an effective snapshot of those challenges. These challenges include the difficulties in balancing clinical practice with research commitments, especially during the training stages of a clinical career and for those who practise a craft specialty. This challenge of balancing clinical and academic work, among other challenges, was also identified by Trusson *et al*.[30]

Another significant challenge is the continuous challenge of acquiring and maintaining research funding through successful research and career development grant applications, a problem across many fields of academic research. Within the CL, this is embodied by the need to find additional research funding, such as the AMS Starter Grants for Clinical Lecturers. However, the challenge of continuously funding research persists throughout a clinical academic career, where time-consuming grant applications must be balanced alongside clinical and other activities. This is despite the evolving opportunities for clinical academic research funding made available by major research funders across the UK.[31]

Personal matters such as balancing a clinical academic career with a family life, as well as personal finances are also challenges that a clinical academic will encounter. With regard to the former, it has been reported that balancing a family life with being a clinical academic was challenging for a number of reasons, including the perceived impact on career progression and difficulties in finding appropriate childcare.[12] As for personal finances, the financial costs of a clinical academic career have been

identified in the interviews in this evaluation, as well as being presented in a multimethod study that compared medical clinical academics with those from other health professions,[32] and our evaluation of the ACF which found that salary differences when undertaking an ACF were also a factor considered by the awardees.

As a means of addressing some of these challenges, Kehoe *et al* published a list of twelve tips that would support the recruitment, retention and progression of clinical academics.[33] Among those tips, it was recommended that institutions should offer more support to clinical academics with caring responsibilities (tip 7), and that employers and line managers should take more flexible approaches to the individual needs of clinical academics (tip 12). Heeding these tips, alongside the others, would help to address the challenges of both the CL and the wider challenges faced in the career of a clinical academic.

Further research

Consider undertaking further research in order to understand why there is a marked difference in progression rates to the first destination clinical academic roles by region and by year of award end in particular. The research in this area raises a number of questions that were unable to be fully answered by the qualitative interviews in this study.

It would be useful to understand more around further funding on and after the CL award. This study has shown that some award holders are reporting funding as coinvestigator as well as principal investigator, but this distinction is not flagged in Researchfish.

Conclusions

The NIHR CL for medics and dentists has become a valuable part of the clinical academic pathway. It provides a route to independence for many early-career researchers by significantly increasing the number of initial postdoctoral posts available within the system.[1] With well over half of awardees progressing further on the clinical academic pathway immediately after completion of the CL, it is clear that the scheme has helped to grow the pool of clinical academics ready to become the senior research leaders of the future within the healthcare system. With an observed trend of increasing fill rates over time, this 'pipeline' is set to expand in the future. This study shows that the large majority of awardees consider the CL to be highly valuable, both for the protected time it offers to undertake research and also due to the range of other benefits the award offers. However, it is important to note that the experience of the award is not positive for all CLs, with time pressure being a real concern for many CLs, who might expect that their 2 years research time be fully (not mostly) protected, which for nearly half of previous cohorts has not been the case. Furthermore, a notable minority have experienced unsatisfactory support from some host partnerships, while there are serious concerns around further funding opportunities on completion of their award.

This study, by seeking to understand the experience of CLs through identification of enablers and barriers, combined with the undertaking of a rigorous statistical analysis of factors associated with progression to first destination clinical academic roles, has been able to confirm that neither gender nor having a craft specialty have a significant impact on progression at this stage of the clinical academic pathway. However, it has highlighted that there is still the potential, despite improvements already made to the award, to further increase the proportion of those progressing to first destination clinical academic roles, particularly through seeking to understand the four factors that have been identified as being statistically associated with progression.

Author affiliations
[1]Academy, National Institute for Health and Care Research, Leeds, UK
[2]Institute of Applied Health Research, University of Birmingham, Birmingham, UK
[3]University Hospitals Birmingham, NHS Foundation Trust, Birmingham, UK
[4]School of Medicine, University of Leeds Leeds Institute of Health Sciences, Leeds, UK
[5]Department of Public Health, Policy and Systems, Institute of Population Health, University of Liverpool, Liverpool, Lancashire, UK
[6]Academy of Medical Sciences (AMS), London, UK

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Contributors CJS made substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work. CJS drafted the work and contributed to revising it critically for important intellectual content. CJS provided final approval of the version to be published. CJS agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. HH-J made substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work. HH-J drafted the work and contributed to revising it critically for important intellectual content. HH-J provided final approval of the version to be published. HH-J agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. HH-J has overal responsibility for the content as the guarantor. LH made substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work. LH drafted the work and contributed to revising it critically for important intellectual content. LH provided final approval of the version to be published. LH agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. JH made substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work. JH drafted the work and contributed to revising it critically for important intellectual content. JH provided final approval of the version to be published. JH agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. MRM made substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work. MRM drafted the work and contributed to revising it critically for important intellectual content. MRM provided final approval of the version to be published. MRM agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. HH made substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work. HH drafted the work and contributed to revising it critically for important intellectual content. HH provided final approval of the version to be published. HH agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. CM made substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work. CM drafted the work and contributed to revising it critically for important intellectual content. CM provided final approval of the version to be published. CM agreed to be accountable for all aspects of the

work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. MMR made substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work. MMR drafted the work and contributed to revising it critically for important intellectual content. MMR provided final approval of the version to be published. MMR agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. EK drafted the work and contributed to revising it critically for important intellectual content. EK provided final approval of the version to be published. EK agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. BE drafted the work and contributed to revising it critically for important intellectual content. BE provided final approval of the version to be published. BE agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. KL made substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work. KL drafted the work and contributed to revising it critically for important intellectual content. KL provided final approval of the version to be published. KL agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. JF made substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work. JF drafted the work and contributed to revising it critically for important intellectual content. JF provided final approval of the version to be published. JF agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. PT made substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work. PT drafted the work and contributed to revising it critically for important intellectual content. PT provided final approval of the version to be published. PT agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. LAC made substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work. LAC drafted the work and contributed to revising it critically for important intellectual content. LAC provided final approval of the version to be published. LAC agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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ORCID iDs
Chris James Stevenson http://orcid.org/0000-0003-3254-5841
Helen Harris-Joseph http://orcid.org/0000-0002-9211-5117
Lorraine Harper http://orcid.org/0000-0003-1343-9234
Jenny Hewison http://orcid.org/0000-0003-3026-3250
Matthew R Mulvey http://orcid.org/0000-0002-6357-3848
James Fenton http://orcid.org/0000-0001-7282-9799
Lisa Ann Cotterill http://orcid.org/0000-0002-4083-3483

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