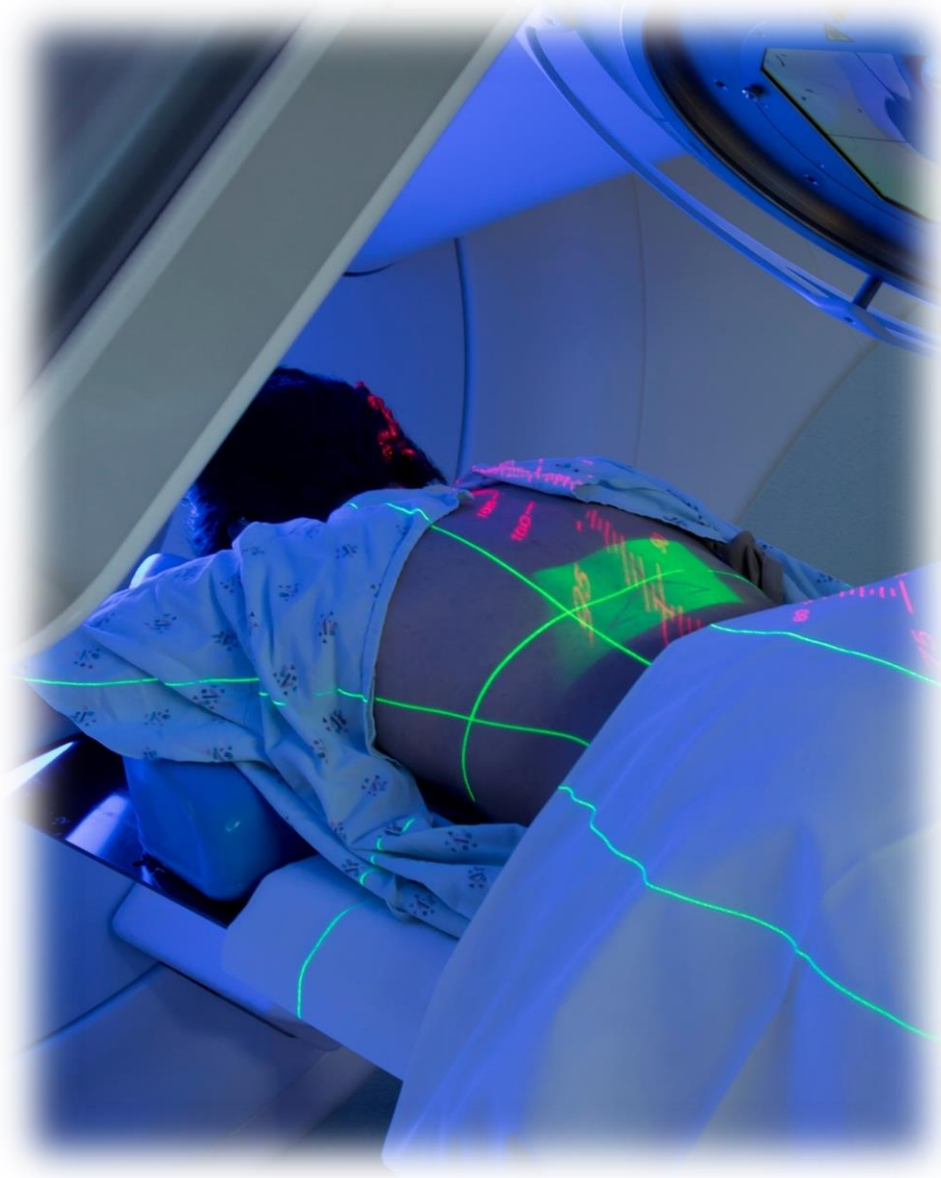


IPEM

Institute of Physics and
Engineering in Medicine



**Is HSST Meeting the Needs of the
Medical Physics Profession?**

Executive Summary

In 2023, the Institute of Physics and Engineering in Medicine's (IPEM's) Workforce Intelligence Unit ran a survey to determine whether Higher Specialist Scientist Training (HSST) is meeting the needs of the Medical Physics profession.

IPEM believes that HSST delivers the necessary skills to support a Consultant Clinical Scientist (CCS) workforce of the future and is in support of the programme.

However, examination of survey responses raised concerns with regards to the positioning of HSST, as well as the time commitment of the programme.

Survey respondents commented positively on the skills delivered by HSST. However, concerns were raised regarding the relationship between completion of HSST and appointability for CCS roles. Respondents also raised concerns with regards to the programme's time commitment, and some aspects of programme content.

IPEM has generated the following recommendations based on survey findings:

1. Communicate the position of registration on the HSSR: this is evidence of the skillset needed to become a CCS, not a guarantee of a CCS position
2. Promote the existing flexibility in delivery of HSST and increase this further where possible. Increase awareness of existing part-time modalities, and longer time frames for completion. To increase further the flexibility of the programme, support for modular or remote learning is suggested
3. Suggest that the current HSST physics curriculum is reviewed, with particular focus on the Imaging track and alignment with Medical Physics Expert (MPE) requirements
4. Support HSSE as alternative route to registration, through workshops, peer support, and alternative learning opportunities
5. Encourage MRI staff who are interested in HSST to enrol on the programme's Imaging track, without Part C if they hold a relevant PhD

Background

A Consultant Clinical Scientist (CCS), for the purposes of this report, is a medical physicist who sits at Band 8c, 8d, or 9 in the NHS Agenda for Change framework. Historically, CCS roles have lacked consensus on job title, job description, length of service, or pay banding. The Higher Specialist Scientist Register (HSSR) was founded in 2015 to remedy this^[1]. The aim of the HSST is to provide future CCS staff with the skills and expertise necessary to support the workforce of the future: clinical and scientific leadership, knowledge to support consultant-level clinical advice in the context of direct patient care, and strategic direction and innovation supporting service development.

Since 2022, all new CCS roles in Wales require applicants to be on the HSSR. This has been discussed in the other devolved nations of the UK: it would put Scotland and Northern Ireland at a disadvantage, as funding for HSST is not available in either

country[2]. There are currently two routes to eligibility for the HSSR. These include HSST, a five-year, doctoral-level training program, and Higher Specialist Scientist Equivalence (HSSE), a pathway to demonstrate professional equivalence to HSST.

Our survey was sent to Heads of Medical Physics in Radiotherapy, Nuclear Medicine, Magnetic Resonance, and Diagnostic Radiology and Radiation Protection. Although the scope of the survey covered these four specialisms, we acknowledge that HSST is available to staff in other specialisms of Medical Physics and Clinical Engineering. We gathered 43 responses from Radiotherapy (68% response rate), 26 from Nuclear Medicine (20% response rate), 23 from Diagnostic Radiology and Radiation Protection (35% response rate), and 19 from Magnetic Resonance (26% response rate).

Higher Specialist Scientist Training

This report accompanies a publication detailing the current state of the CCS workforce, and the prevalence of HSST across Medical Physics. A thematic analysis of respondent comments within this survey was undertaken to better understand the extent to which HSST is meeting the needs of the Medical Physics profession. The following themes emerged from the comments: *the position of HSST relative to CCS posts; time commitment and resulting diversity, equity, and inclusion concerns; and programme content*. This analysis was discussed at IPEM's Heads of Medical Physics and Clinical Engineering meeting in January 2024[3], and IPEM's Professional and Standards Council meeting in April 2024[4]. Discussion of survey findings and suggestions made in response to them are also reported.

Data were collected by posing open-ended questions to participants about CCS recruitment difficulties and respondents' positions on HSST. Answers to these questions were analysed using thematic analysis techniques adopted from methodologies in social sciences research[5,6]. A realist, theory-driven approach was used: analysis focused on reporting on meaning from the experiences of participants and was informed by background knowledge of current workforce issues. This is consistent with the qualitative research methodologies used by IPEM's Workforce Intelligence Unit. Coding and analysis of data was performed using NVivo 14[7]. Where it was necessary to seek clarification or further detail, respondents were contacted for follow-up.

In the analysis and interpretation of the data, possible indications of response bias must first be acknowledged. The National School for Healthcare Science maintains records on the attrition rate for HSST across all medical physics cohorts, which is approximately 17% (communicated via email by E. Bowers, received April 2024). However, respondents to the present survey reported that 42% of staff across their departments who had been enrolled on HSST had withdrawn from the programme. Given that the figure obtained from the survey is higher, this likely reflects a negative bias toward HSST from respondents, which may influence the qualitative data that were gathered. This was considered throughout analysis and interpretation of data.

HSST and the Needs of the Future Workforce

Respondents provided commentary on some ways in which they felt that HSST met the needs of the Medical Physics profession. Some stated that appropriate skills were being taught on the programme:

"It is a structured programme for attaining the skills that historically have been learned (or not) on the job"

"It can help fill in gaps / expand skills in certain areas if used well. Also useful as a benchmark for management to "prove" you deserve a consultant CS post!"

Others appreciated the ability of the programme to offer consistence and conformity of skillset at higher levels of the Medical Physics profession. In discussions on the findings, employers have stated that when graduates apply for more senior roles, HSSR registration has been useful for ensuring that certain skill requirements are met[3]. In particular, the research component of the programme is perceived as valuable, as it provides an opportunity for staff to undertake doctoral level research without incurring a substantial financial burden[3]. **In these respects, it is felt that HSST is well-positioned to meet the needs of the current and future CCS workforce.**

The Position of HSST Relative to CCS Posts

Certain participant comments raised the question of whether graduates of HSST are intended to become eligible for a CCS post immediately upon completion of the programme. When asked about difficulties with recruitment to CCS posts, respondents discussed the characteristics that suitable applicants should have. Graduates of HSST were compared with those who were not on the HSSR but had plentiful work experience, and it was clear that experience was a preferred characteristic:

"I would be looking for the right experience acquired over the right period of time."

When the HSSR was first established, it was intended that those registered on it would be automatically considered eligible to take on a CCS role[1]. The comparisons drawn in the data between new HSSR registrants and experienced non-HSSR registrants suggests that this idea may persist. However, respondents report staff who consider HSST at band 8a, and in some cases after one or two years of working as a clinical scientist (the minimum requirement for applying for HSST[8]). Given the stated value of experience to CCS roles, it is unlikely that staff enrolling at these stages will be considered ready upon completion of the programme. **The role of HSST must therefore be re-positioned, not as a sole means of obtaining a CCS post, but as a means of demonstrating necessary skills once an individual has gained sufficient practical experience.**

Time Commitment and Diversity, Equity, and Inclusion Concerns

Individuals in the Medical Physics profession have previously raised the concern that, with HSST involving a heavy time commitment, staff with caring responsibilities may be excluded from the programme[9]. This concern was reflected as a theme in the survey data:

“Staff with young children do not want to do HSST when they hear it is so much more onerous than it was initially intended to be.”

Difficulties with HSST for staff with caring responsibilities have also been seen in reasons given for withdrawal from the programme, provided by the National School of Healthcare Science (in an email from E. Bowers, received April 2024). Across the Medical Physics sub-specialisms, at least 20% of individuals who withdrew since the first cohort have cited work-life balance as their primary reason for withdrawal. Due to the high number of individuals who did not provide a reason for withdrawal, the true figure is likely to be even higher.

To support an inclusive CCS workforce of the future, the HSST must be seen by prospective applicants as a flexible programme that can adapt to the needs of those undertaking it. In a discussion of survey findings, suggestions were provided regarding increased flexibility of HSST. The possibility of support for remote learning, and modular delivery for certain elements, were discussed as potential solutions[3,4].

Support for part-time learning and allowances for longer completion timeframes were also suggested[3,4]. Although HSST is generally offered on a full-term, five-year basis, there are provisions for undertaking HSST on a part-time basis[10]. This will allow for completion times longer than five years, which have already been reported in practice[4].

Departments that are considering enrolling staff on HSST must be aware of the available provisions, to ensure that concerns regarding work-life balance and inclusivity of the programme may be addressed.

Programme Content

An emergent theme from the data was a feeling that some HSST programme content should be reviewed. Comments within this theme could be split into comments specific to those in Magnetic Resonance, and general comments on physics content.

Some survey respondents from Magnetic Resonance stated that they were not aware of what HSST involves. This was further highlighted among some comments, which discussed the value that HSST “would” or “could” bring to the profession. Conditional statements such as these suggest that the availability of HSST for Magnetic Resonance requires further promotion. A potential reason for this finding could be found among comments on the “Imaging” track of HSST, available to staff in Magnetic Resonance, Nuclear Medicine, and Diagnostic Radiology and Radiation Protection:

“Some of the scientific b modules do not differentiate between DR&RP, MRI, or nuclear medicine very well... There is opportunity to make the A and B modules far more relevant to the workplace if they can be tailored to individual department needs”

In addition to calling for a review of curriculum content, particularly on the Imaging track, the findings suggest that HSST should be promoted to staff in Magnetic Resonance. As many staff enter this field with a PhD, it will be important to make clear the existing provisions regarding the research component of HSST, for staff with existing doctoral qualifications[11].

Subsequent discussions on survey findings focused on HSST’s physics content more generally, with a focus on its relationship to content in other professional qualifications[3,4]. Clinical Scientists in medical physics have a heavy burden of registration, with titles such as Medical Physics Expert, Radiation Protection Advisor, and Radiation Waste Advisor being legal requirements for departments. The HSST curriculum was designed with the requirements for these certifications in mind [12,13]. During follow-up with survey respondents, it was suggested that this alignment is not currently being taken advantage of: staff enrolled on HSST were reported to be unlikely to use HSST course material in applications for MPE registration. Reasons cited included perceptions that course material does not meet MPE registration requirements, and that HSST should be pursued after MPE status has already been obtained. **Based on these findings, IPEM would recommend that the HSST curriculum is reviewed, and the exact nature of the alignment with MPE requirements is clarified. This should be communicated across the profession, to ensure that the alignment of HSST and MPE requirements can be utilised effectively.**

Other Considerations – Higher Specialist Scientist Equivalence

While not the subject of the present survey, HSSE is available as an alternative route to HSSR registration. This route is intended for staff who can demonstrate that they meet all the HSSR’s standards of proficiency, without having completed HSST. For individuals interested in this route, the HSSE framework may provide guidance on the types of opportunities and experience that should be sought. As this route does not involve formal training in the same sense as HSST, it is possible that this may work to address some of the outlined concerns about the flexibility of this programme. **IPEM believes that increased support for HSSE may be a means of working towards a diverse, equitable, and inclusive CCS workforce of the future.**

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