

*Developing people
for health and
healthcare*

Scaling the Heights:
an overview of
Higher Specialist
Scientist Training (HSST)
in Healthcare Science

Modernising Scientific Careers:
Higher Specialist Scientist Training



NHS
Health Education England

Scaling the Heights: An overview of Higher Specialist Scientist Training (HSST)

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Foreword

The Modernising Scientific Careers (MSC) programme sets out for the first time a comprehensive training and career framework for the whole healthcare science workforce inclusive of the more than 50 different scientific professional specialisms. In its conception it aimed to provide a coherent framework that was accessible, affordable and designed specifically to both capture scientific and technological advances and to provide improved outcomes for patients, the service and professionals.

A key aspect of the framework from the start was the formalisation of training to develop talented clinical scientists to undertake quality assured Higher Specialist Scientist Training (HSST) programmes to prepare them for roles as Consultant Clinical Scientists. It is envisaged that Consultant Clinical Scientists will work synergistically and in partnership with their medical colleagues and within multiprofessional clinical teams to support clinical scientific practice aimed at quality improvement, innovation and world-class outcomes for patients. This scientific expertise and leadership will provide important benefits and added value to patients and to the service as it moves forward through the 21st century. This will bring to fruition the vision of science and realise the potential of scientific and technological advances for both translational and personalised medicine.

Scaling the Heights: an overview of Higher Specialist Scientist Training (HSST) in Healthcare Science, describes the way in which HSST curricula have been developed through joint working with the Academy of Medical Royal Colleges and individual medical royal colleges, senior scientists and scientific professional bodies, employers and patients; its underpinning academic doctoral programme through joint working with the Council for Healthcare Science in Higher Education and workforce commissioners; the approach to implementation of these programmes through the National School of Healthcare Science; and certification (including registration on the Higher Specialist Scientist Register), as well as the approach to recognising previous training, experience and qualifications (equivalence) through the Academy for Healthcare Science.

I commend this document to those who will be involved in delivering and managing HSST training. I wish to acknowledge and thank all of those individuals and organisations who have given so generously of their time and for their commitment in developing the HSST curricula and programmes.



Professor Sue Hill,
Chief Scientific Officer (CSO) for England

About this document

1. This document sets out the detailed proposals and plans to take forward the development and implementation of Higher Specialist Scientist Training (HSST) in England within the UK Modernising Scientific Careers (MSC) programme in a range of healthcare science specialisms. The HSST programme will train and develop consultant clinical scientists who will provide expert scientific leadership and innovation for the benefit of patients and health services.

Introduction

2. The healthcare science (HCS) workforce plays a central role in safe and effective patient care across all pathways of care from conception, health and wellbeing to end of life. There are about 50,000 employees in the HCS workforce in the NHS in the UK, and they are involved in approximately 80% of all clinical diagnoses.
3. The MSC programme is a UK-wide educational and training framework for HCS that provides a transparent, standards-driven educational and training framework for more than 45 specialisms of HCS. The National School of Healthcare Science (NSHCS) is located within the national Lead Local and Education Training Board (LETB) for HCS, Health Education West Midlands (HEWM), and is integral to the delivery and quality management of HSST programmes.
4. The MSC programme has been able to demonstrate a number of achievements to date by:
 - developing a coherent narrative about the healthcare science workforce – its purpose, its benefits and its opportunities;
 - making the education and training of the HCS workforce understandable and accessible to employers, potential entrants, patients and the public;
 - creating a training and career framework that is enabling and permissive but not ‘inevitable’ and automatic, allowing skills required by the service and talents held by the workforce to be better utilised;
 - developing training programmes that are quality assured and fit for purpose in sustaining a clinical scientific workforce for the NHS with the right numbers, the right skills and the right values and behaviours, blending scientific talent and vision with ensuring patient-centredness, safety and improved outcomes;
 - supporting a key tenet of the NHS Constitution, which indicates that ‘[The NHS] works at the limits of science – bringing the highest levels of human knowledge and skill to save lives and improve health’;
 - basing all curricula on *Good Scientific Practice*, which contextualises the NHS Constitution for the healthcare science workforce;
 - ensuring that the services offered by this workforce are best value for money, efficient and forward-looking.

5. MSC only really has meaning if it can be demonstrated that it benefits patients and their clinical outcomes. It has done so by developing a future workforce – and addressing the needs of the current workforce – by ensuring:
- safer scientific, diagnostic and clinical services;
 - healthcare scientific services that are more patient and clinically focused;
 - a wider and more general scientific knowledge base, enabling a better focus on patient pathways;
 - specialist training that is more thematic and inclusive, thus addressing the challenge of general versus specialist services;
 - a flexible workforce focused on the future and receptive to the use of, for example, genomics, personalised medicine, bioinformatics, nanotechnology, research and innovation to improve patient outcomes;
 - significant developments in scientific clinical leadership
6. The MSC Career Framework has four training programmes, all of which address key aspects of the Health Education England (HEE) Mandate, including:
- a. **Assistant and Associate Training Programme (AATP):** designed for the HCS Career Framework 2–4 workforce; sets out a programme of training and development opportunities, including apprenticeships and foundation degrees; assistants and associates will be registered on Accredited Voluntary Registers (AVRs) which will be held by the AHCS
 - b. **Practitioner Training Programme (PTP):** normally comprises a three-year full-time Honours Bachelors degree in Healthcare Science, which integrates academic and workplace based learning; in the Life Sciences biomedical scientists will be regulated through the HCPC whilst HCSPs in other specialisms will be registered on AVRs through the AHCS
 - c. **Scientist Training Programme (STP):** a three-year pre-registration postgraduate academic and work based programme combining an underpinning part-time Master’s degree in Clinical Science and commencing with a rotational training programme in a themed group of up to four healthcare science specialisms, followed by training in a defined specialism. Successful completion of both elements of the STP leads to the award of a Certificate of Completion of the STP (CCSTP) by the NSHCS. Holders of the CCSTP are then eligible to apply to the Academy of Healthcare Science (AHCS) for a Certificate of Attainment that in turn confers eligibility to apply to the Health and Care Professions Council (HCPC) for registration as a clinical scientist.
 - d. **Higher Specialist Scientist Training Programme (HSST):** a five-year work based programme supported by an underpinning part-time doctoral level programme. Details of this programme are set out below. The Academy of Medical Royal Colleges (AoMRC) has issued a Statement in support of HSST (Appendix 1 – Executive Summary), confirming the Medical Royal Colleges’ agreement to engage with senior clinical scientists and facilitate the development of HSST curricula in relevant areas. The full statement can be seen at <http://bit.ly/HSST-AoMRC>

7. The MSC framework also makes provision for an Accredited Scientific Practice (ASP) programme at each of the four levels, enabling a structured and transferrable programme of continuing professional and personal development (CPPD) to offer employers and the workforce flexibility and clear development opportunities.
8. The MSC Career Framework model (Appendix 2) demonstrates the entry routes and high-level outcomes of the HSST programme. The proposals and development plan for its implementation in England are set out in detail in this paper. Implementation of HSST in the other UK countries will be developed to suit local circumstances.
9. The Health Education England HCS Implementation Network Group (HCSING), which is accountable to HEE, oversees HSST implementation in England. All Local Education and Training Boards (LETBs) are represented on this Network, and the Lead LETB for HCS, Health Education West Midlands (HEWM), and the NSHCS support it.

Background

10. Clinical scientists have been employed in the NHS for over 40 years as consultant clinical scientists, recognised through both pay and employment arrangements. A recent review of consultant clinical scientist appointments in the NHS in England and Wales identified more than 600 in the role. These very senior clinical scientists provide scientific clinical advice and care alongside medical consultants and are involved across the healthcare spectrum.
11. Through MSC the HCS workforce is being modernised, with review, revision and enhancement of the role of scientists and their contribution to the clinical care of patients. This includes a commitment to develop HSST programmes in defined scientific specialisms, providing the opportunity to regularise and develop a formal and quality assured programme of training, in order to ensure a supply of individuals suitable for consultant level appointment.
12. The [Strategy for UK Life Sciences](#) (Dec 2011) and [Innovation, Health and Wealth, Accelerating Adoption and Diffusion in the NHS](#) (Dec 2011) highlight the importance of innovation to the NHS, which also forms a major plank of HEE educational policy. Consultant clinical scientists will clearly have a crucial contribution to make to high quality patient care through the introduction of new scientific and technological advances, improved interaction and communication with patients and clinical teams, and innovation in practice and care. They will support innovation in all its aspects of science, technological and service developments.
13. HSST, as part of the policy of MSC, is in its final stages of development. This document sets out the details of its implementation and is aimed at potential applicants to HSST, providers, trainers, the Higher Education Institution (HEI) sector, LETBs and professional bodies.
14. Specifically, the document sets out arrangements for:
 - eligibility, routes of entry and appointment to HSST programmes;
 - developing training curricula, assessment and unpinning academic programmes to agreed standards;
 - ensuring that there are well-defined training outcomes reflecting the needs of NHS patients;
 - quality assurance processes underpinning all curricula and assessment programmes, as well as the delivery of training programmes through accredited and quality assured placements, which include a requirement both for well-trained trainers and time to train.

Eligibility, routes of entry and appointment into HSST programmes

Eligibility

15. Following agreement with the local LETB, appointment into HSST programmes and training centres that have been accredited by the National School of Healthcare Science (NSHCS) will be through a national appointment process in England that will be led by the NSHCS (see below).
16. The process seeks to ensure not only high calibre scientific practice, but also that successful appointees reflect the values and behaviours that will make them role models for the whole of the NHS.
17. In order to be eligible for entry into HSST programmes clinical scientists must demonstrate:
 - registration (or eligibility and application underway) with the HCPC as a clinical scientist and
 - *normally* at least one further year in the workplace to consolidate and enhance clinical scientific skills, learning and experience (including research and education) and
 - ability to demonstrate meeting any additional specific selection criteria required for a particular specialism.
18. Application for entry into HSST will be extremely competitive. Therefore while the minimum eligibility requirements set out above are *necessary* for application to HSST programmes, they do not confer entitlement to appointment into an HSST programme. Appointment will be through a national selection and benchmarking process developed by the NSHCS.

Routes of entry

19. In England, there will be two routes of entry into HSST training. Both will result in the successful appointee receiving a Higher Specialist Scientist National Training Number (HSSNTN) from the NSHCS.
20. Through the **direct entry route**, clinical scientists in HSST will be competitively appointed into an established HSST post in an accredited training department.
21. Alternatively, some HSST clinical scientists may be benchmarked and appointed into training with the support of their employers through an **in-service training** route, as long as employers can demonstrate the ability to support HSST training by meeting accreditation standards.
22. In both cases (and in order to be allocated a HSSNTN), potential HSST applicants **must** participate in the national appointment and benchmarking process and meet at least the minimum entry requirements. For direct entry applicants, this will be a competitive

process, whereas in-service applicants will be required to go through the national appointment process to ensure that they meet the standards for entry into HSST.

Appointment to HSST programmes

23. Applicants will be invited to participate in an appointment process that is proportionate, reflects the seniority of applicants and which meets the standards of the Equality Act (2010). It will be led by the NSHCS, which will establish appointment panels comprising employers, professional bodies, medical representatives and lay/patient members.
24. The approach will use methods that assess the suitability, values, skills and experience of an applicant using multiple-station interviews involving situational judgement tests, clinical problem solving, scientific skills and values-based (reflecting the *NHS Constitution*) assessment processes. Further details about the process will be published in due course.

Developing training curricula, assessment programmes and underpinning academic programmes to agreed standards

Developing training curricula

25. Standards of education and training for healthcare science across the UK have been drafted, based on the Academy for Healthcare Science's (AHCS) *Good Scientific Practice* (www.ahcs.ac.uk/GSP). The AHCS is responsible for these standards, ensuring through its quality assurance framework that it works with appropriate partners to ensure that they are appropriately applied. They reflect the high-level educational standards that HEE (and its equivalent in the rest of the UK) has set out in *Introducing Health Education England: Our Strategic Intent* (Jan 2013) and which are also part of the HEE Mandate. AHCS standards are also reflective of and consistent with those of the HCPC and the General Medical Council (GMC) for medical training.
26. Where there is a workforce requirement for consultant clinical scientists, in accordance with the Statement on HSST from the AoMRC, curricula have been developed through Medical Royal Colleges in conjunction with senior scientists nominated by scientific professional bodies. Higher Education Institutions (HEIs), employers, clinical scientists in HSSTs and the public are also involved in the curriculum development and review process.
27. HSST curricula are modular in design and build on the broader-based training provided by STP. They are aimed at training senior scientists to deliver an equivalent standard of clinical scientific specialist care as that of their medically qualified colleagues. There is also a significant and detailed generic professional syllabus based on *Good Scientific Practice*, which is value based, emphasising patient-centred care, patient safety, quality improvement, and professional leadership development and practice.
28. Successful completion of the entire HSST programme (or demonstration of equivalence to it) will lead to formal accreditation and registration of this senior cohort through the AHCS. This will allow the appropriate and necessary strengthening of the workforce while building and incorporating scientific expertise into patient care at the most senior level. HSST programmes are essential in specific specialist areas (Appendix 4) in order to provide a clear educational and training pathway for clinical scientists who will offer the necessary and unique clinical scientific expertise for patients at a consultant level of practice. Additional developments for HSST programmes in other specialisms are likely to be required as the workforce need for these emerges.
29. The modularity of the HSST curricula will enable the development of a structured and transferrable CPPD programme through Accredited Practice at this level – Accredited Expert Scientific Programmes (AESP) – in a range of scientific areas to be agreed with employers. Modules from approved curricula will provide the basis of academic and work based learning where this is appropriate. AESP will enable employers to develop the workforce they require; the programmes will also support clinical scientific professional

development for individuals who do not wish to undertake the full HSST programme, as well as for those who want to acquire expertise post HSST in a different area of practice in the specialism.

Assessment programmes

30. Underlying the critical importance of quality assured and excellent education – the lynchpin of the Educational Outcomes Framework – is the demonstration of successful achievement of the learning outcomes, competencies and capabilities required for completion of HSST (or the equivalent elsewhere in the UK). An assessment programme for HSST is being developed within the context of the overall approach to assessment in MSC in order to demonstrate successful progress and achievement of the outcomes required by the curricula. Validated work based assessment procedures will be used to assess and support the progress of HSST clinical scientists, enabling learner-centred feedback to be generated and support to be provided where this is required.
31. In England, this process will be led by the NSHCS using data storage and monitoring of progress on a bespoke **On-Line Assessment Tool (OLAT)**. A system for regular (at least annual) review of the progress of all HSST clinical scientists, also under the auspices of the NSHCS (or its equivalent in the other UK countries), will be implemented.
32. Final assessment of those in HSST in the life sciences will be through the Fellowship examination of the Royal College of Pathologists (FRCPath). In the physiological and physical final assessment processes are under development that will be designed to demonstrate an equivalent standard of achievement through a structured final assessment (SFA) process that will be overseen in England by the NSHCS in partnership with the scientific professional bodies and the Medical Royal Colleges (MRCs).
33. HEIs accredited to deliver the doctoral programme will also include knowledge assessments as part of the award, both for those who complete all the requirements of the qualification (see below) and for those doing relevant modules. This rigorous approach to the evaluation of outcomes from HSST will ensure that consultant clinical scientists are capable, competent and excellent leaders and experts in their clinical scientific fields.

Underpinning academic programme

34. In addition to the work based experiential component of these five-year programmes, clinical scientists in HSSTs will be expected to follow (or demonstrate equivalence to) an underpinning doctoral-level academic programme that uses the HSST curriculum learning outcomes as the basis for their development and delivery. The previous Medical Education England Healthcare Science Programme Board (MEE HCSPB) endorsed the recommendation that this doctoral-level programme should be delivered in partnership with the HEI sector, MRCs and scientific professional bodies.

35. The purpose of the doctoral-level programme is to formalise and *facilitate the learning* of HSST clinical scientists as they:

- systematically acquire and apply a substantial body of scientific and clinical knowledge at the forefront of their specialism and embrace the future scientific and technological advances within the field;
- create and interpret new knowledge through original research scholarship, requiring advanced academic enquiry;
- systematically acquire, develop and apply the qualities and transferable skills necessary for employment as a consultant clinical scientist, requiring the exercise of personal responsibility and taking initiative in certain complex and unpredictable situations;
- develop the knowledge, skills, experience, behaviours and attitudes required of a clinical leader of scientific services in an evolving and rapidly developing health and life sciences sector.

36. It is envisioned that the doctoral-level programme will be delivered through several HEIs that will be expected to demonstrate partnership delivery arrangements with specialist professional bodies and/or MRCs. There will be three key elements or domains, reflecting the higher-level skills and requirements to support consultant-level practice:

- **Specialist Clinical Scientific Programmes** that meet relevant aspects of the HSST curricula, developed by the HSST curriculum working groups described above, underpinned by supervised work based and mentored training;
- **Leadership and Professional Development** aligned to **Good Scientific Practice**, including patient-centred care, quality and safety, leadership, professionalism, innovation, bio enterprise, teaching and learning, quality improvement, bioinformatics, health policy, human resource and business management, research methods (these areas are not necessarily exhaustive and others have been or may be identified);
- **Research, Development and Innovation** demonstrated by a scientific, policy or educational research dissertation or peer-reviewed papers prepared for publication during the HSST programme.

37. Since a key purpose of the doctoral-level programme is to facilitate the opportunities for learning by those undertaking HSST by providing a structure within which they can obtain underpinning knowledge and learning to support their progression through the programme, it is not necessarily a requirement that the doctoral-level award itself must always be obtained.

38. The doctoral-level programme will be designed in a modular format and although completion of the whole programme will lead to the award of a professional doctorate, it will not be an essential requirement for completion of HSST to obtain the doctoral award per se. What will be necessary is for learners to demonstrate that they have acquired the knowledge, skills and outcomes of the HSST curriculum to the required doctoral level in all elements of the programme.

39. The doctoral-level programme should underpin and support this, but in itself will not be the end point of the HSST programme nor be a requirement for the demonstration of competence and fitness to practise, although demonstration of equivalence to its key components will be required. This will be defined within the HSST assessment strategy and in conjunction with the Medical Royal Colleges and the NSHCS.
40. The full Position Statement on the HSST doctoral-level programme is in Appendix 3.

Quality assurance framework and quality management of HSST programmes

Quality assurance framework

41. A quality assurance framework, which is consistent with the key elements of [Liberating the NHS: Developing the Healthcare Workforce – From Design to Delivery](#) (Jan 2012), has been developed for HCS education and training in England.
42. The 13 Local Education and Training Boards (LETBs) in England are responsible for improving the local delivery and quality of education and training, and monitoring educational outcomes. Health Education West Midlands (HEWM) has been identified as the Lead LETB for HCS. Working through the NSHCS, it will account to HEE for the Educational Outcomes Framework (EOF) with respect to healthcare science and support workforce planning for HCS.
43. A HCS Implementation Network Group (HCSING) in which all 13 LETBs participate oversees implementation of the MSC programme, including HSST, and a Health Education England Advisory Group (HEEAG) for HCS provides advice on the workforce and training and education issues to HEE's Multi-Professional Advisory Board (MPAB).
44. Although the Lead LETB will formally report to HEE on overall progress with the EOF with respect to HCS, it can only achieve this through working with and through the 13 LETBs. HEE will hold individual LETBs to account for the quality and delivery of training in HCS, aligned to the allocation of educational funding and reflecting the HEE Mandate for quality assured education and training. The AHCS will maintain accredited voluntary registers for healthcare science, including the Higher Specialist Scientist Register. It is anticipated that the quality management arrangements of HSST programmes put in place by the NSHCS in England will be reflected by equivalent arrangements across the rest of the UK.
45. The HSST programme will ensure the following, reflecting the domains of the English Education Outcomes Framework (EOF).
 - **excellent education** – education and training will be commissioned and provided to the highest standards, ensuring learners in healthcare science have an excellent experience and that all elements of education and training are delivered in a safe environment for patients, staff and learners;
 - **competent and capable staff** – HSST should ensure that in time there are sufficient consultant clinical scientists aligned to service and changing care needs, so that people are cared for by consultant clinical scientists who are properly trained and qualified, and who have the high-level knowledge and skills to provide clinical scientific care at the highest level, while working effectively in a team;
 - **flexible workforce receptive to research and innovation** – HSST will create a consultant clinical scientist workforce that will be responsive to changing service models and responsive to innovation and new technologies with expert knowledge about best practice, research and innovation, which will enable adoption and

dissemination of better quality service delivery to reduce variability and poor practice;

- **NHS values and behaviours** – HSST will ensure that consultant clinical scientists have the necessary values and behaviours to provide person-centred care and enhance the quality of the patient experience. Through the selection of HSST clinical scientists with the necessary attitudes and behaviours, and continually re-enforcing and assessing these, consultant clinical scientists will be role models for the whole workforce;
- **widening participation** – processes of equivalence and appointment for the HSST programme will enable talent and leadership in healthcare science to flourish free from discrimination, with fair opportunities to progress, so that everyone can participate to fulfil their potential.

46. The educational robustness of MSC training curricula has been further quality assured through an external review process of the curricula by the Institute of Education (IOE). The IOE was asked to review the curricula of the new MSC healthcare science training (PTP, STP and HSST) to provide independent external educational advice and assurance that there is clarity at each level of the programme of the standard and outcomes to be achieved. Specifically it evaluates whether:

- the educational linkages between the three programmes are sufficiently clear and transparent;
- the educational ‘spiral’ between the curricula ensures that the level and standards of the curricula in the three are distinct and demonstrably progressive;
- the level of HSST curricula (doctoral level) reflects the high level of professional clinical practice anticipated for a consultant clinical scientist workforce;
- the modular components of the HSST curricula are equivalent in level, content and outcomes so that others undertaking such modules (but not necessarily the whole of the HSST programme) can use these as the basis to gain specific and recognised expertise in a narrow area of the HSST programme (Accredited Expert Scientific Practice – AESP).

Quality management of HSST programmes

47. The NSHCS was established to deliver a national co-ordinating function for the education of the HCS workforce from 2011/12 as part of the implementation of MSC. It has responsibility for: quality managing the workplace based training outcomes of the HSST programme; ensuring the progress of individual HSST clinical scientists through both a regular and a formal annual process of review; and both quality managing and supporting the quality of training placements.
48. The School, working with LETBs, will also provide an appropriate level of support for HSST clinical scientists in conjunction with local providers to ensure that curricula outcomes are being addressed to enable HSST clinical scientists to progress. Employers, training centre networks, LETBs and HEIs involved in the HSST programme will also have a close relationship with the School, enabling it to fulfil its quality management role. Further details about the NSHCS can be located at www.nshcs.org.uk
49. Successful completion of the HSST programme (both the work-based component and the learning outcomes of the doctoral programme) will result in the HSST clinical scientists receiving a Certificate of Completion from the NSHCS.

Outcomes of training and equivalence to HSST

Outcomes of HSST

50. The Certificate of Completion effectively 'recommends' the clinical scientist in HSST to the AHCS. The AHCS will issue the final Certification of Attainment, enabling registration on the AHCS's Higher Specialist Scientist Register.
51. Clinical scientists who successfully complete HSST will acquire high-level clinical scientific expertise and will provide a senior clinical scientist workforce that will:
- provide highly developed and advanced clinical scientific expertise and interpretation to the service and to patients within the clinical team;
 - undertake scientific responsibilities at a level of accountability similar to that of consultant medical staff (although the overall clinical responsibility of patients resides with the medical consultant);
 - be accountable for scientific advice and, in some cases, treatment, aimed at improving patient outcomes;
 - provide leadership and influence across a number of scientific, diagnostic and clinical areas/specialisms;
 - through the translation of cutting-edge scientific research and education, bring strategic direction and innovation into practice.
52. Employers will have the opportunity to appoint expert consultant clinical scientists to work with doctors and within clinical teams, enabling the optimal development and use of scientific advances and technology to further innovate to benefit patient care and services.
53. Consultant titles for clinical scientists will be agreed in conjunction with scientific professional bodies and MRCs and within the context of the new Career Framework for HCS, which is currently under development in conjunction with NHS Employers (NHSE) to ensure that there is no ambiguity or confusion for patients. Guidance will be developed to help support employers develop a quality assured appointment process for those eligible to apply for consultant clinical scientist posts.

Equivalence to HSST

54. An underlying principle of MSC is the availability of a process of equivalence to give those in HCS the opportunity to provide evidence which demonstrates that previous training, qualifications and experience meet specified learning outcomes so that such achievements are recognised, avoiding the need to repeat education or training unnecessarily.
55. It will enable those who have not undertaken a specific MSC education and training programme but who nevertheless can demonstrate that they have the necessary knowledge, skills, competence, and attitudes and behaviours to demonstrate achievement of its outcomes. This will also apply to EU and overseas entrants. The AHCS will be responsible for the process and delivery of equivalence decisions.

56. The MSC programme recognises three routes for individuals seeking equivalence:

- **Route 1:** for those who have worked in healthcare or science in the UK, EU or overseas seeking recognition and clarification of their place on the MSC Career Framework;
- **Route 2:** for individuals applying for entry to MSC accredited programmes and who are requesting recognition of equivalence to demonstrate they have met certain aspects of the *entry requirements for the programme*;
- **Route 3:** for those who have gained admission to an accredited MSC academic programme but who wish to apply for exemption of elements, either work based or academic components or both.

57. In terms of HSST, equivalence operates for all three routes:

- **Route 1 (entry on to the Register for Higher Specialist Scientist Training):** where the AHCS accepts the evidence offered by senior clinical scientists demonstrating that they have met the academic, clinical and professional outcomes of higher specialist scientist training, they will be admitted to the Register, which will be held by the AHCS;
- **Route 2 (entry into an HSST programme):** there will be opportunities and processes to demonstrate equivalence to scientist training of prior knowledge, skills, experience, attitudes, behaviours and learning. Where evidence can be provided to demonstrate that previous training, qualifications and experience meet the specified learning and clinical outcomes of the Scientist Training Programme (STP), the AHCS can grant a Certificate of Equivalence to it. However, the Certificate of Equivalence from the AHCS does not itself confer registration as a clinical scientist since the HCPC will need to be satisfied that its Standards of Proficiency are met before it grants registration;
- **Route 3 (exemption of elements of the HSST programme):** HSST clinical scientists on a HSST programme who can demonstrate that they have achieved elements of the training may apply for equivalence (AHCS) or accreditation of prior learning as appropriate. This can be for parts of either the academic or work based components of the programme. A good example of this will be HSST clinical scientists applying for exemption of the dissertation element of the doctoral programme because they already hold a research PhD.

HSST ongoing developments: work programme and commissioning and funding

HSST work programme

58. There is an extensive work programme in place to fully establish HSST programmes and their constituent elements. A MSC HSST Project Group oversees the day-to-day development of the programme, and an HSST Operational Group brings together the MRCs to work together to develop the relevant modular HSST curricula and associated assessment programmes. The MRCs have also been asked to undertake an advisory role in the following areas:

- i. the potential for accreditation and/or membership of an appropriate professional umbrella organisation, including, but not restricted to, the Medical Royal Colleges;
- ii. underpinning doctoral-level academic programme to support the curriculum equivalence criteria with respect to HSST programmes based on curriculum and assessment processes.

HSST workforce planning, commissioning and funding

59. Health Education West Midlands, the Lead LETB for HCS education commissioning, will together with the MSC team support and lead the arrangements for the underpinning doctoral programme. The National School of Healthcare Science (NSHCS) will accredit and quality assure workplace training providers and the overall delivery of programmes.

60. Individual LETBs will be asked to capture the demand for HSST through local workforce planning arrangements, and then challenge and moderation will be undertaken in line with the new HEE system arrangements.

61. Commencing in 2014, LETBs have agreed to provide a training allowance to accredited providers of HSST training that is inclusive of fees for the doctoral programme. This annual allowance to provider units for each individual entering HSST will be made available for eligible clinical scientists in HSST programmes appointed through the national appointment process both for the direct entry route and the in-service training route.

Summary

62. It is anticipated that 19 HSST curricula will be available for programmes starting in Autumn 2014. The next stages of implementation that will be addressed include:

- finalising the funding model;
- commissioning and accrediting quality assured workplace programmes through the NSHCS;
- commissioning the doctoral-level programme;
- agreeing and implementing appointment arrangements.

Appendix 1: Academy of Medical Royal Colleges Statement on HSST

Statement from the Academy of Medical Royal Colleges on Higher Specialist Scientist Training: Executive Summary

1. The Academy of Medical Royal Colleges (AoMRC) recognises the importance of Higher Specialist Scientist Training (HSST) in ensuring appropriate career development and progression for a highly skilled healthcare scientific workforce.
2. AoMRC recognises that scientists who have completed Higher Specialist Scientist Training should have recognition of their training and status. The mechanism of establishment of such an arrangement will vary across the Royal Colleges, but may be achieved by membership or fellowship of the relevant Medical Royal College or a faculty of a Royal College or through a collaborative Royal Colleges' framework.
3. We intend to support the development of curricula for top-level scientists working in areas relevant to each college's field of interest as part of the Modernising Scientific Careers (MSC) programme. These curricula will be developed by both scientists, currently working at an appropriate level in the relevant field, and medically trained colleagues, who may be nominated by the specialist society or specialist group, as determined by the relevant Royal College, together with specialist colleagues with an interest in education and training
4. Detailed curricula for each scientific discipline will serve to define the appropriate scope of practice to ensure both clarity and synergy between the medical and scientific disciplines and promote optimal patient care. It is our intention that these curricula will be designed to promote the development of a cohort of outstanding clinical scientists.
5. Copyright and intellectual property rights relating to the curricula and assessments will be the property of the relevant College or faculty. This does not conflict with the acknowledged need for external scrutiny and approval, and utility within the MSC HSST programme.
6. We believe that that this work should be subjected to external independent scrutiny and regulation, such as that which is currently delivered for the medical profession by the General Medical Council.
7. The use of the word 'consultant' in the title of posts held by non-medical scientists must not mislead the public. The AoMRC welcomes the Chief Scientific Officer's agreement to discussions to ensure that this shared aim is achieved.

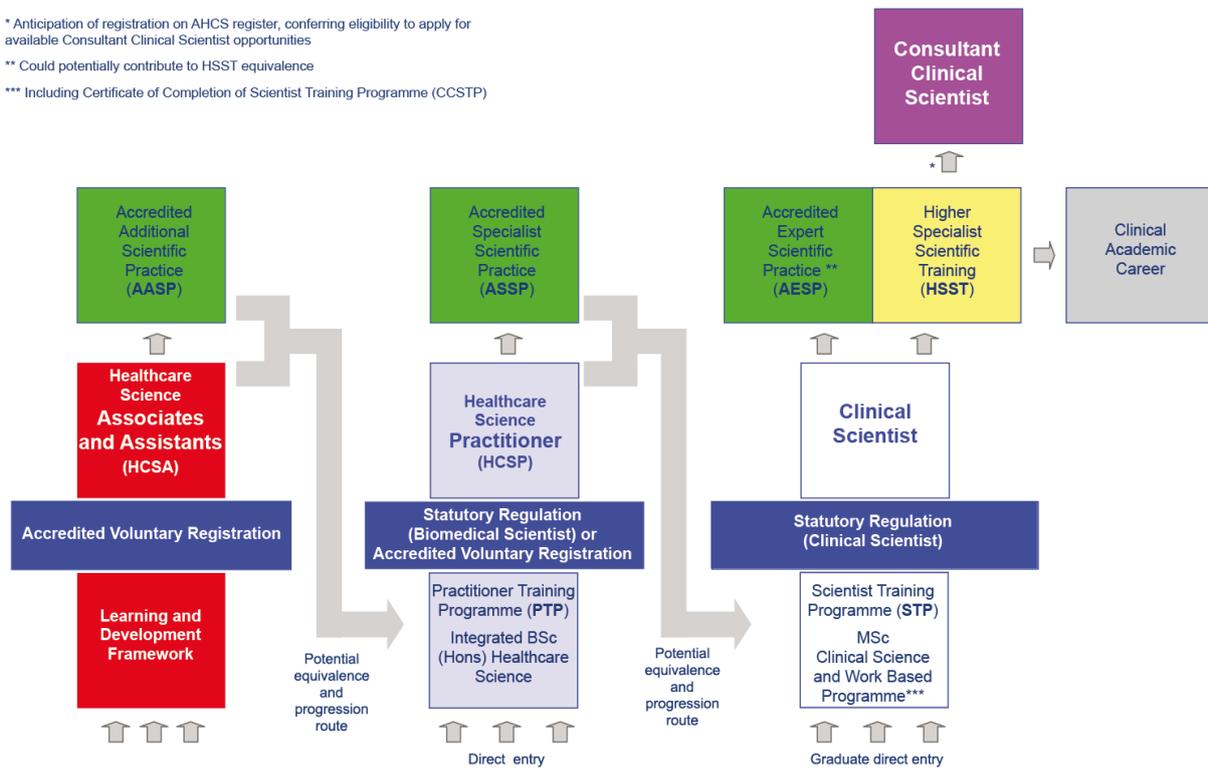
Appendix 2: MSC UK Model for Career and Training Pathways

Modernising Scientific Careers: Career and Training Pathways

* Anticipation of registration on AHCS register, conferring eligibility to apply for available Consultant Clinical Scientist opportunities

** Could potentially contribute to HSST equivalence

*** Including Certificate of Completion of Scientist Training Programme (CCSTP)



Revised Sep 2013

Appendix 3: Modernising Scientific Careers Higher Specialist Scientist Training Doctoral Level Training Programme Position Statement

Background

1. The Higher Specialist Scientist Training Programme (HSST) is a five-year workplace based training programme supported by an underpinning doctoral-level academic programme and, where appropriate, Royal College qualifications.
2. In Autumn 2011 the Medical Education England Healthcare Science Programme Board (MEE HCSPB) established a short-life Task and Finish Group to explore options and make recommendations for the shape and content of the underpinning academic programme for HSST. The UK-wide HSST Strategic Oversight Board and MEE HCSPB subsequently endorsed the recommendation that this should be a doctoral-level programme delivered in partnership with the higher education sector, Medical Royal Colleges and scientific professional bodies.
3. This document has been developed in order to help those involved in curriculum development for HSST – Medical Royal Colleges, senior scientists and HEIs – understand the role of the doctoral-level programme within the overall context of Higher Specialist Scientist Training.

Purpose

4. The purpose of the doctoral-level programme is to formalise and *facilitate the learning* of HSST clinical scientists as they:
 - systematically acquire and apply a substantial body of scientific and clinical knowledge at the forefront of their specialism and embrace the future scientific and technological advances within the field;
 - create and interpret new knowledge through original research scholarship requiring advanced academic enquiry;
 - systematically acquire, develop and apply the qualities and transferable skills necessary for employment as a consultant clinical scientist, requiring the exercise of personal responsibility and taking largely autonomous initiative in complex and unpredictable situations;
 - develop the knowledge, skills, experience, behaviours and attitudes required of a clinical leader in an evolving and rapidly developing health and life sciences sector.
5. This doctoral-level programme is not intended to and will not replace any existing or proposed exit examination (e.g. FRCPath) of the whole of an HSST programme associated with demonstration of competence and fitness to practise at a consultant level.

Its purpose is to underpin and support learning, e.g. in preparation for the exit examination where this is appropriate and thought necessary.

Structure

6. It is envisioned that the doctoral-level programme will be delivered through several HEIs in conjunction with the demonstration of a partnership delivery arrangement with specialist professional bodies and/or Medical Royal Colleges and will have three key elements or domains, reflecting the higher-level skills and requirements to support consultant clinical scientist-level practice:
 - **Specialist Clinical Scientific Programmes** that meet relevant aspects of the HSST curricula, developed by the HSST curriculum working groups described above, underpinned by supervised work based and mentored training;
 - **Leadership and Professional Development** aligned to **Good Scientific Practice**, including patient-centred care and safety, leadership, professionalism, innovation, bio enterprise, teaching and learning, quality improvement, bioinformatics, health policy, human resource and business management, research methods (these areas are not necessarily exhaustive and others may be identified);
 - **Research, Development and Innovation** demonstrated by a scientific, policy or educational research dissertation or peer-reviewed papers prepared for publication during the HSST programme.

Design and application

7. Since a key purpose of the doctoral programme is to *facilitate the opportunities for learning* of those undertaking HSST by providing a structure within which they can obtain underpinning knowledge and learning to support their progression through the programme, it is not necessarily a requirement for the doctoral award itself to always be obtained.
8. The doctoral-level programme will be designed in a modular format, reflecting and delivering learning to support the HSST curriculum in the specialism, and although completion of the totality of the programme *will* lead to the award of a professional doctorate, it will not be an essential requirement for completion of HSST to obtain the doctoral award per se.
9. What will be necessary is for learners to demonstrate that they have acquired the knowledge, skills and outcomes of the HSST curriculum to the required doctoral level in all elements of the programme. The professional doctorate should underpin and support this, but in itself will not be the end point of the HSST programme nor be required for the demonstration of competence and fitness to practise. This will be defined within the HSST assessment strategy and in conjunction with the Medical Royal Colleges and the National School of Healthcare Science.

10. The relationship of the underpinning doctoral-level programme to the overall HSST programme may therefore be:
- a. undertaking the full professional doctoral programme and being awarded the doctoral degree by the relevant HEI;
 - b. a learner with a relevant PhD can formally undertake all (or some, if seeking equivalence through prior learning) of the relevant modules in the scientific and professional areas. In this circumstance, the HEI will not accept the PhD for Accreditation of Prior Experiential Learning (APEL) of the research element of the professional doctorate (as one thesis cannot be used for two academic awards) and so unless the complete programme is followed the professional doctorate award will not be available. Achievement of the outcomes and module credits from the other two areas of the underpinning doctoral programme can however be demonstrated. This means that individuals could choose at a later date to undertake a dissertation, perhaps related to policy or education, and to submit this, with the agreement of the relevant HEI, towards a professional doctorate;
 - c. demonstrating that *learning* in the three domains of the professional doctorate has been achieved through a high-stakes assessment process (e.g. FRCPATH), although in the absence of *formal* learning, especially in the professional and potentially in the research and some aspects of the scientific domains, it is likely to mean that demonstration of the underpinning doctoral-level academic modules in these areas will be required.
11. This means that in order to provide the flexibility required, given the range of knowledge, skills, experience and qualifications those undertaking HSST will have, the doctoral programme will be important in terms of the learning *inputs* it provides, as a vehicle to support the learning *outputs* of the HSST curriculum itself.
12. The intention and purpose of the doctoral programme is therefore to create a structure to facilitate and provide the underpinning knowledge, learning and support to those undertaking HSST. It is more about learning *inputs* to support HSST programme learners than it is about a designated *output* for satisfactory completion of the programme (e.g. a specific academic award), which will be linked to the competence and fitness for practise assessment strategy.

Delivery

13. It is expected that HEIs awarding either credits for individual modules or the full award will develop partnership/consortia arrangements that include professional bodies and Medical Royal Colleges, and draw on any other specialist expertise as necessary. It is also expected that HSST clinical scientists will learn in a multiprofessional environment with the opportunity to learn and work with students on other programmes in other health professions and out with health, for example those following MBA, Leadership, Management, Finance programmes.

Benefits

14. This novel approach to the provision of an underpinning academic doctoral programme for HSST will:

- recognise existing and potentially future high-stakes assessments (e.g. FRCPath) or assessment strategies as a marker of achievement of competence and fitness to practise as a consultant clinical scientist;
- formalise and provide a framework for the current ad hoc approaches to learning inputs and opportunities provided by professional bodies, Medical Royal Colleges and HEIs;
- potentially provide access to funding to support the learning provision as HSST becomes supported by a commissioned flexible doctoral programme;
- provide greater flexibilities for HEIs in delivering elements of the professional doctorate, potentially using aspects of existing programmes to provide some of the learning inputs;
- potentially enable HEIs to increase student numbers in some of their professional doctorate modules;
- provide the flexibility to support the attainment of a professional doctorate for some clinical scientists in HSST.

Appendix 4: Higher Specialist Scientist Training (HSST) Specialisms

15. Curriculum for the HSST specialisms listed below will be available from April 2014, although additional curricula may be required in the future. For some consultant clinical scientist roles it may be necessary to construct HSST programmes involving crossover between the specialisms.

Life sciences (completion of HSST will include the requirement to achieve the FRCPATH by examination)

- Analytical toxicology
- Clinical biochemistry
- Clinical immunology
- Reproductive science
- Haematology
- Histocompatibility and immunogenetics
- Genetics
- Microbiology
- Molecular pathology of acquired disease
- Molecular pathology of infection
- Virology

Physiological sciences

- Audiological science
- Cardiac science
- Gastrointestinal and urological sciences
- Ophthalmic and vision science
- Respiratory and sleep physiology
- Vascular science

Physical sciences

- Medical physics (which includes diagnostic imaging sciences and radiotherapy physics)
- Clinical biomedical engineering

Appendix 5: List of Abbreviations

Abbreviation	Explanation
AHCS	Academy for Healthcare Science
AoMRC	Academy of Medical Royal Colleges
AESP	Accredited Expert Scientific Practice
ASP	Accredited Scientific Practice
CCSTP	Certificate of Completion of Scientist Training Programme
CPPD	continuing personal and professional development
CSO	Chief Scientific Officer
EOF	Educational Outcomes Framework
FRCPath	Fellowship of the Royal College of Pathologists
GMC	General Medical Council
HCPC	Health and Care Professions Council
HCS	Healthcare Science
HCSING	Healthcare Science Implementation Network group
HCS HEEAG	Healthcare Science Health Education England Advisory Group
HCSPB	Healthcare Science Programme/Professional Board
HEE	Health Education England
HEWM	Health Education West Midlands
HEIs	Higher Education Institutions
HCPC	Health and Care Professions Council
HSSNTN	Higher Specialist Scientist National Training Number
HSST	Higher Specialist Scientist Training
IOE	Institute of Education
LETBs	Local Education and Training Boards
MEE	Medical Education England
MPAB	Multiprofessional Advisory Board (of HEE)
MRCs	Medical Royal Colleges
MSC	Modernising Scientific Careers
NSHCS	National School of Healthcare Science
OLAT	On-line Assessment Tool
PTP	Practitioner Training Programme
SFA	Structured Final Assessment
STP	Scientist Training Programme