

**COMPETENCES REQUIRED FOR APPLICANTS
TO ATTAIN STATE REGISTRATION AS CLINICAL SCIENTISTS**

SPECIALTY :

BLOOD TRANSFUSION



This document comprises a discipline-specific version of the general competence document and provides additional guidance as to how to complete the general document, Appendix 1 of the Guidelines, that you must submit with your application.

Remember that the aim of the process is for the candidate to satisfy the assessor that he or she has the appropriate basic qualifications and length of experience for issue of the Certificate of Attainment, and that the training programme/period of supervised practice has enabled the candidate to achieve the basic level of competence required for registration as a clinical scientist.

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GENERIC COMPETENCES		SPECIFIC COMPETENCES
HPC Standards of Proficiency Code – Clinical Scientist	1-SCIENTIFIC	Be able to demonstrate the rigorous application of scientific methods in his/her experience to date
3a.1	<ul style="list-style-type: none"> understanding the science that underpins the specialty (modality) and the broader aspects of medicine and clinical practice 	<ul style="list-style-type: none"> must understand the principles of the techniques and methods employed in the discipline must be familiar with the evidence for, and limitations of, the common procedures relevant to the discipline used in the diagnosis and management of patients and donors, and the range of products provided for patients must have a basic knowledge of related disciplines in order to be able to integrate relevant diagnostic results into an interpretation must be familiar with information on developments and needs in the discipline
3a.1	<ul style="list-style-type: none"> demonstrating a strong base of knowledge appropriate to the specialty and to the investigations and therapeutic options available 	
2b.1	<ul style="list-style-type: none"> experience of searching for knowledge, critical appraisal of information and integration into the knowledge base 	
2b.4	<ul style="list-style-type: none"> ability to apply knowledge to problems associated with the routine provision, and development, of the service 	
2a.1	<ul style="list-style-type: none"> ability to identify the clinical decision which the test/intervention will inform 	
2a.3, 2c.1	<ul style="list-style-type: none"> ability to make judgements on the effectiveness of procedures 	
2a.2	<ul style="list-style-type: none"> application of the knowledge base to the specialty (modality) and to the range of procedures/investigations available 	
<i>Achievement of:</i>	<ul style="list-style-type: none"> an understanding of the physical and chemical methods employed in the practice of transfusion science a critical understanding of the preparation of blood and blood products and the application of diagnostic tests in the assessment of the status of the patient and of donors a critical understanding of the integration and interpretation of transfusion science laboratory parameters with other diagnostic parameters (haematological, etc) in the overall clinical assessment of the patient and donor a critical understanding of scientific method and the tools required to successfully evaluate, develop and/or modify both current and emerging technologies as routine diagnostic or product preparation tools in transfusion science 	
<i>Achieved through:</i>	<ul style="list-style-type: none"> a structured taught element (eg approved MSc course, lecture programme) and participation in appropriate BBTS training programmes participation in local research or scientific review meetings the presentation of outcomes of method evaluations, protocol development and clinical research initiatives of a standard suitable for publication 	
<i>Assessed by:</i>	<ul style="list-style-type: none"> the locally nominated supervisor and a nationally appointed tutor 	

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HPC Standards of Proficiency Code – Clinical Scientist	2-CLINICAL	Be able to demonstrate the following relevant to the contribution of his/her specialty to patient care:
2a.4, 2b.2, 2c.1	<ul style="list-style-type: none"> ability to provide interpretation of data and a diagnostic (therapeutic) opinion, including any further action to be taken by the individual directly responsible for the care of the patient 	<ul style="list-style-type: none"> must be able to advise on choice of samples and aspects of patient management relevant to the discipline must understand the range of blood and plasma components available for therapy, their common uses and limitations must be aware of the range of diagnostic tests in use in transfusion science for assessment of patients and donors, their uses and limitations must be aware of the strengths and weaknesses of the evidence-base for commonly used products and diagnostic tests in transfusion science
2b.3, 3a.1	<ul style="list-style-type: none"> understanding of the wider clinical situation relevant to the patients presenting to his/her specialty 	
2b.3	<ul style="list-style-type: none"> ability to develop/devise an investigation strategy taking into account the complete clinical picture 	
1a.5, 3a.2	<ul style="list-style-type: none"> understanding of the clinical applications of his/her specialty and the consequences of decisions made upon his/her actions/advice 	
3a.2	<ul style="list-style-type: none"> awareness of the evidence base that underpins the use of the procedures employed by the service 	
<i>Achievement of:</i>	<ul style="list-style-type: none"> a general understanding of human physiology and its application to the practice of transfusion science an understanding of the physiology of man and the effects of disease on physiological processes an understanding of the effectiveness of therapies on physiological processes and of the mechanisms by which they modulate disease processes in transfusion science an understanding of the effects of pre- and post-analytical variables required for the appropriate clinical interpretation and assessment of diagnostic procedures in transfusion science developed research skills and expertise sufficient to support supervised and collaborative research initiatives in transfusion 	
<i>Achieved through:</i>	<ul style="list-style-type: none"> a structured taught element (eg approved MSc course, lecture programme) and participation in appropriate BBTS training programmes (eg involving use of a log book recording practical experience in the relevant field) participation in local seminars, clinical meetings, audit and report evaluation and writing self-endeavour (eg literature awareness) under the tutelage of an appropriate transfusion science specialist 	
<i>Assessed by:</i>	<ul style="list-style-type: none"> the locally nominated supervisor and a nationally appointed tutor 	

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GENERIC COMPETENCES		SPECIFIC COMPETENCES
HPC Standards of Proficiency Code – Clinical Scientist	3-TECHNICAL	Be able to demonstrate the following, relevant to the modality or area of specialisation in which he/she wishes to be recognised
3a.2	<ul style="list-style-type: none"> understanding of the principles associated with a range of techniques employed in the modality 	<ul style="list-style-type: none"> must understand the principles and common techniques used in the preparation of blood components and plasma fractions must understand the techniques used to test blood donations and plasma products to ensure their safe clinical use must understand the diagnostic methods used to select blood transfusion products for individual patients must have technical experience of the commonly used methods for the above used in the transfusion department must have an understanding of the principles of quality management, their practical application to monitoring processes and tests used in transfusion science and their use to ensure processes and tests remain in control
2b.4	<ul style="list-style-type: none"> knowledge of the standards of practice expected from these techniques 	
2b.4	<ul style="list-style-type: none"> experience of performing these techniques 	
2b.4	<ul style="list-style-type: none"> the ability to solve problems that might arise during the routine application of these techniques (troubleshooting) 	
2c.1, 2c.2	<ul style="list-style-type: none"> understanding of the principles of quality control and quality assurance 	
2c.1, 2c.2	<ul style="list-style-type: none"> experience of the use of quality control and quality assurance techniques including restorative action when performance deteriorates 	
<i>Achievement of:</i>	<ul style="list-style-type: none"> an ability to perform common technical procedures in transfusion science as defined in local Standard Operating Procedures that meet the needs of CPA or MCA accreditation and GMP/GLP standards a critical ability to review the results and determine the significance of quality control information for relevant analytical procedures in transfusion science a detailed understanding of analytical principles utilised in transfusion science to facilitate method troubleshooting an understanding of the hazards associated with the practice of transfusion science and the appropriate controlling legislation (eg COSHH) and appropriate procedures for risk assessment (eg RIDOR, clinical governance, etc) 	
<i>Achieved through:</i>	<ul style="list-style-type: none"> a structured taught element (eg approved MSc course, lecture programme) and participation in appropriate BBTS training programmes (eg involving use of a log book recording practical experience in the relevant field) practical instruction at bench level; participation in locally or nationally organised courses self-endeavour (eg literature awareness) under the tutelage of an appropriate transfusion science specialist 	
<i>Assessed by:</i>	<ul style="list-style-type: none"> the locally nominated supervisor and a nationally appointed tutor 	

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HPC Standards of Proficiency Code – Clinical Scientist	4-RESEARCH AND DEVELOPMENT	Be able to demonstrate a training in research which should include:
2b.1	<ul style="list-style-type: none"> ability to read and critically appraise the literature 	<ul style="list-style-type: none"> •must be able to undertake an assessment of the literature on a selected subject and provide a written critique of this •must be able to design a sample research project with a defined aim and a structured design that addresses this aim •must have the practical knowledge and skills to undertake a research project and to provide a critical written report of the project •must have a knowledge of appropriate available statistical methods •must be able to present the outcome of a research study orally to an audience •must be able to provide a critical appraisal of a research study (publication, report or oral presentation)
2b.1	<ul style="list-style-type: none"> ability to develop the aims and objectives associated with a project 	
2b.1	<ul style="list-style-type: none"> ability to develop an experimental protocol to meet the aims and objectives in a way that provides reliable and robust data (i.e. free of bias) 	
2b.1	<ul style="list-style-type: none"> ability to perform the required experimental work ability to produce and present the results (including statistical analysis) 	
2b.1	<ul style="list-style-type: none"> ability to critically appraise results in the light of existing knowledge and the hypothesis developed and to formulate further research questions 	
1b.4, 2b.1	<ul style="list-style-type: none"> ability to present data and provide a critical appraisal to an audience of peers – both spoken and written 	
<i>Achievement of:</i>	<ul style="list-style-type: none"> developed research skills and expertise sufficient to support supervised and collaborative research initiatives in transfusion an awareness of the extent of knowledge in transfusion science and an ability to employ appropriate information tools to search for, consolidate and critically examine information 	
<i>Achieved through:</i>	<ul style="list-style-type: none"> a structured taught element (eg approved MSc course, lecture programme) and participation in appropriate BBTS training programmes (eg involving use of a log book recording practical experience in the relevant field) participation in local research meetings and evidence of supervised and collaborative research initiatives, potentially leading to PhD self-endeavour (eg literature awareness) under the tutelage of an appropriate transfusion science specialist 	
<i>Assessed by:</i>	<ul style="list-style-type: none"> the locally nominated supervisor and a nationally appointed tutor 	

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HPC Standards of Proficiency Code – Clinical Scientist	5-COMMUNICATION	Be able to communicate in both the written and spoken media to colleagues, peers and patients:
1a.6	<ul style="list-style-type: none"> ability to assess a situation and act accordingly when representing the specialty 	<ul style="list-style-type: none"> must be able to communicate effectively with colleagues within the discipline and the wider clinical community must be able to present findings in both written and spoken media must be able to educate and train colleagues and understand the principles involved in supervision of other staff must be capable of using modern communication devices must be able to demonstrate a basic understanding of management issues and techniques associated with the specialty
1a.6	<ul style="list-style-type: none"> ability to respond to enquiries regarding the service provided when dealing with clinical colleagues 	
1a.2, 1b.1, 1b.3	<ul style="list-style-type: none"> ability to communicate with patients, carers and relatives, the public and other healthcare professionals as appropriate 	
1b.3, 1b.4	<ul style="list-style-type: none"> ability to communicate the outcome of problem solving and research and development activities 	
2b.1	<ul style="list-style-type: none"> evidence of presentation of scientific material at meetings and in the literature 	
<i>Achievement of:</i>	<ul style="list-style-type: none"> an ability to communicate clearly to professional colleagues in both formal and informal settings an ability to train and educate others in relevant aspects of transfusion science an understanding of those aspects of information technology pertinent to the service provision and support of transfusion science an understanding of basic management principles 	
<i>Achieved through:</i>	<ul style="list-style-type: none"> a structured taught element (eg approved MSc course, lecture programme) and participation in appropriate BBTS training programmes provision of written reports, preferably in the form of peer-reviewed publications giving practical instruction in the local department and participation in locally or nationally organised meetings as a presenter self-endeavour (eg literature awareness) under the tutelage of an appropriate transfusion science specialist 	
<i>Assessed by:</i>	<ul style="list-style-type: none"> the locally nominated supervisor and a nationally appointed tutor 	

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HPC Standards of Proficiency Code – Clinical Scientist	6-PROBLEM SOLVING	Be able to deal with the unexpected and thus be able:	
2a.2	<ul style="list-style-type: none"> to assess a situation 	<ul style="list-style-type: none"> must be able to recognise when a process or test is out of control must be able to draw on knowledge to formulate possible reasons for such a failure, and assess the severity of outcomes for each must be able to suggest routes to resolving a problem on their own initiative or through recognition of who has the skills required for a solution 	
1a.6, 2b.1	<ul style="list-style-type: none"> determine the nature and severity of the problem 		
1a.6, 2b.1	<ul style="list-style-type: none"> call upon the required knowledge and experience to deal with the problem 		
1a.6, 2b.1	<ul style="list-style-type: none"> initiate resolution of the problem 		
1a.6	<ul style="list-style-type: none"> demonstrate personal initiative 		
<i>Achievement of:</i>	<ul style="list-style-type: none"> an ability to take a holistic approach to assessing the checking of laboratory outputs in transfusion science an understanding of the strengths and weaknesses of quality control approaches an ability to identify and use areas of knowledge relevant to addressing the problem to hand 		
<i>Achieved through:</i>	<ul style="list-style-type: none"> a structured taught element (eg approved MSc course, lecture programme) and participation in appropriate BBTS training programmes practical instruction at bench level; participation in locally or nationally organised courses or assessment schemes (eg NEQAS exercises) self-endeavour under the tutelage of an appropriate transfusion science specialist eg through case studies 		
<i>Assessed by:</i>	<ul style="list-style-type: none"> the locally nominated supervisor and a nationally appointed tutor 		

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	GENERIC COMPETENCES	SPECIFIC COMPETENCES
HPC Standards of Proficiency Code – Clinical Scientist	7-PROFESSIONAL ACCOUNTABILITY	Be able to demonstrate an understanding of management principles and techniques, including the following:
1a.1	<ul style="list-style-type: none"> Understanding of the legal and ethical boundaries of the modality, and the ethical aspects of scientific research. 	<ul style="list-style-type: none"> must be able to recognise legal and ethical boundaries of the modality and practice and conduct research within these boundaries must be able to recognise the limits of his/her knowledge and skills must understand the principles of clinical governance and be able to audit, reflect on and review practice must understand the need for and basic requirements of accreditation schemes appropriate to the modality must understand the importance of effective communication with colleagues and be able to function as an effective member of a multidisciplinary team must understand the principles of appraisal and be able to supervise staff in his/her area of responsibility must participate in an appropriate CPD scheme (after completion of training) must have acquired a basic knowledge of health and safety requirements appropriate to the discipline must have acquired a basic understanding of the structure and organization of the department, and relevant financial aspects.
1a.6	<ul style="list-style-type: none"> Ability to recognise the limits of personal practice and when to seek advice. 	
1a.7	<ul style="list-style-type: none"> Ability to manage personal workload and prioritize tasks appropriately. 	
1a.3, 1a.4, 2b.5, 2c.2	<ul style="list-style-type: none"> Understanding of the principles of clinical governance including clinical audit, accreditation requirements relevant to the modality. The importance of confidentiality, informed consent and data security 	
1b.2	<ul style="list-style-type: none"> Ability to contribute effectively to work undertaken as part of a multi-disciplinary team 	
1b.4	<ul style="list-style-type: none"> Ability to supervise others as appropriate to area of practice. Understanding of the role of appraisal in staff management and development. 	
1a.8, 2c.2	<ul style="list-style-type: none"> Understanding of the need for career-long self-directed learning and the importance of continuing professional development. 	
1a.5, 1a.8, 2b.4, 3a.3	<ul style="list-style-type: none"> Understanding of the need for, and ability to establish and maintain, a safe practice environment. 	
	<ul style="list-style-type: none"> Understanding of the structure and organization of the department and how it fits into the local clinical setting, General understanding of the way the modality is structured and practised in other locations within the UK. Basic understanding of the importance of financial accountability, budgetary control and resource management. 	
<i>Achievement of:</i>	<ul style="list-style-type: none"> an understanding of the management principles and tools used in the service the ability to act as a professional and work effectively as part of a team understanding of the importance and principles of accreditation, audit, confidentiality, data security and safe working practice 	

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<i>Assessed by:</i>	<ul style="list-style-type: none"> • the nominated local supervisor and appropriate professional body external advisor/tutors