COMPETENCES REQUIRED FOR CLINICAL SCIENTISTS TO ATTAIN STATE REGISTRATION

SPECIALTY :	PAEDIATRIC METABOLIC BIOCHEMISTRY

This document comprises a sub-modality 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.

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev 03- Include Management Competences

COMPETENCES REQUIRED FOR CLINICAL SCIENTISTS TO ATTAIN STATE REGISTRATION

SPECIALTY : PAEDIATRIC METABOLIC BIOCHEMISTRY

EXPERIENCE:	The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below.

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.1p	• understanding the science that underpins the specialty (modality) and the broader aspects of medicine and clinical practice	• must understand the scientific principles of the techniques and methods employed in paediatric metabolic biochemistry. • must be able to advise on choice and suitability of samples and aspects of preparation of the patient relevant to paediatric metabolic biochemistry. • must be familiar with sources of up to date information on paediatric and metabolic disorders. • must be familiar with the evidence for and the problems and limitations associated with the common procedures used in the diagnosis and monitoring of paediatric 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 the developments and needs in paediatric metabolic biochemistry.
3a.1g	• demonstrating a strong base of knowledge appropriate to the modality and to the investigations and therapeutic options available	
2b.1g 2b.1p	• experience of searching for knowledge, critical appraisal of information and integration into the knowledge base	
2b.1g	• ability to apply knowledge to problems associated with the routine provision, and development, of the service	
2a.1p	• ability to identify the clinical decision which the test/intervention will inform	
2c.1p	• ability to make judgements on the effectiveness of procedures	
3a.2g	• application of the knowledge base to the specialty (modality) and to the range of procedures/investigations available	

Achievement of:	• an understanding of the principles of the diagnostic methods employed in the practice of paediatric metabolic biochemistry • a critical understanding of the application of investigative protocols and diagnostic tests in the assessment of the biochemical status of the paediatric patient and disorders of metabolism • a critical understanding of the integration and interpretation of clinical biochemistry parameters with other diagnostic parameters (haematological, imaging etc) in the overall clinical assessment of the patient 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 tools in paediatric metabolic biochemistry
Achieved through:	• participation in appropriate ACB training programmes and in other specific courses and training days provided by other relevant organisations, e.g. British Inherited Metabolic Disease Group(BIMDG), National Metabolic Biochemistry (Biochemical Genetics) Network • participation in local research meetings and local, regional and national scientific meetings. • the presentation of outcomes of method evaluations, protocol development and clinical research and/or audit initiatives of a standard suitable for publication • self endeavour, e.g. literature awareness/private studies under the guidance of an appropriate Accredited Clinical Scientist in the modality or submodality
Assessed by:	• the locally nominated supervisor (usually a registered Accredited Clinical Scientist) with an assessor from paediatric metabolic biochemistry

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev03 - Include Management Competences

COMPETENCES REQUIRED FOR CLINICAL SCIENTISTS TO ATTAIN STATE REGISTRATION

SPECIALTY : PAEDIATRIC METABOLIC BIOCHEMISTRY

EXPERIENCE:	The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below.

GENERIC COMPETENCES		SPECIFIC COMPETENCES
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:
2b.1p	• 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	• must recognise the significance of signs, symptoms and analytical results and relate them to specific disease states and clinical situations • must have a detailed understanding of the normal functioning of the human body, with particular emphasis on the modality, to provide a foundation for the understanding of the disease process • must understand the molecular and biochemical basis of the commonly diagnosed inherited metabolic disorders • must fully understand the effects of pre- and post-analytical variables on the interpretation of results • must be able to develop/devise investigation protocols to diagnose specific diseases and to monitor individual patients • must have a detailed knowledge of the appropriateness of investigations and advice given on their results, based on evidence-based practice
3a.1p	• understanding of the wider clinical situation relevant to the patients presenting to his/her specialty	
2b.3p	• ability to develop/devise an investigation strategy taking into account the complete clinical picture	
3a.2p	• understanding of the clinical applications of his/her specialty and the consequences of decisions made upon his/her actions/advice	
3a.2p	• awareness of the evidence base that underpins the use of the procedures employed by the service	

Achievement of:	• an understanding of general clinical medicine and its application to biochemical systems with particular emphasis on paediatric metabolic biochemistry • an understanding of human physiology and the effects of disease on metabolic processes with particular emphasis on paediatric metabolic biochemistry • an understanding of the clinical relevance of inherited or acquired genetic abnormalities which present as paediatric metabolic disorders • an understanding of the effectiveness of therapies and drug interactions and the mechanisms by which they modulate disease processes in paediatric patients • an understanding of the effects of pre- and post-analytical variables required for the interpretation and assessment of diagnostic procedures in paediatric metabolic biochemistry
Achieved through:	• participation in appropriate ACB training programmes and in other specific courses and training days organised by other relevant organisations, e.g. BIMDG, National Metabolic Biochemistry Network • experience in a paediatric metabolic biochemistry department approved for training purposes, under the supervision of an Accredited Clinical Scientist in the modality or sub-modality • participation in local seminars, clinical meetings, attendance at grand rounds and ward rounds, clinical audit and clinical report evaluation and authorisation (under supervision) • self endeavour (eg private study and literature evaluation) under the guidance of an appropriate Accredited Clinical Scientist in the modality or sub-modality
Assessed by:	• the nominated local supervisor (usually a registered Accredited Clinical Scientist) with an assessor from paediatric metabolic biochemistry

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev 03- Include Management Competences

COMPETENCES REQUIRED FOR CLINICAL SCIENTISTS TO ATTAIN STATE REGISTRATION

SPECIALTY : PAEDIATRIC METABOLIC BIOCHEMISTRY

EXPERIENCE:	The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below.

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.2p	• understanding of the principles associated with a range of techniques employed in the modality	• must have practical experience of analytical techniques and procedures commonly used in paediatric metabolic biochemistry and special techniques relevant to the area of practice • must have achieved practical competence of the necessary standard to consistently produce valid results • must have sufficient knowledge of the fundamentals of procedures and techniques to be able to solve problems and troubleshoot • must have a detailed understanding of the principles of internal quality control and external quality assessment and to use this practically to take action to improve performance when that deteriorates. • must understand the components of quality assurance in relation to the practice of paediatric metabolic biochemistry
3a.2p	• knowledge of the standards of practice expected from these techniques	
2b.4p	• experience of performing these techniques	
2b.4p	• the ability to solve problems that might arise during the routine application of these techniques (troubleshooting)	
2c.2g	• understanding of the principles of quality control and quality assurance	
2c.1p	• experience of the use of quality control and quality assurance techniques including restorative action when performance deteriorates	

Achievement of:	• the ability to perform the commonly used techniques employed in the practice of paediatric metabolic biochemistry to the required standards of an operational protocol as defined for the purposes of laboratory accreditation under CPA or its equivalent • the ability to critically review results and determine the significance of quality control and assessment information for analytical procedures in paediatric metabolic biochemistry • a detailed understanding of the analytical principles behind the techniques used in paediatric metabolic biochemistry, to facilitate method troubleshooting and the development of appropriate procedures for preventative maintenance • an understanding of potential hazards (environmental, biological, chemical and isotopic) associated with the practice of paediatric metabolic biochemistry and the appropriate controlling legislation (eg COSHH) and appropriate procedures for risk assessment (RIDDOR) • a thorough appreciation of the importance of quality assurance for the provision of a paediatric metabolic service, including awareness of the specific issues of quality control and assurance for rare specialist assays
Achieved through:	• participation in appropriate ACB training programmes and in other specific courses or training days organised by other relevant organisations, e.g. BIMDG, National Metabolic Biochemistry Network • supervised practical instruction at the laboratory bench • participation in locally organised health and safety courses and experience of the health and safety committee structure in the employing institution • participation in departmental quality forums, such as quality assurance meetings and audit meetings • self endeavour (eg private study and literature awareness) under the guidance of an appropriate Accredited Clinical Scientist in the modality or submodality
Assessed by:	• the locally nominated supervisor (usually a registered Accredited Clinical Scientist) with an assessor from paediatric metabolic biochemistry

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev03 - Include Management Competences

COMPETENCES REQUIRED FOR CLINICAL SCIENTISTS TO ATTAIN STATE REGISTRATION

SPECIALTY : PAEDIATRIC METABOLIC BIOCHEMISTRY

EXPERIENCE:	The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below.

GENERIC COMPETENCES		**SPECIFIC COMPETENCES**
HPC Standards of Proficiency Code – Clinical Scientist	**4-RESEARCH AND DEVELOPMENT**	Be able to demonstrate a training in research which should include:
2b.1p	• ability to read and critically appraise the literature	• must have acquired critical appraisal skills with respect to assessing the importance and relevance of published research • must have basic research skills to be able to identify problems, formulate hypotheses and develop an experimental plan to resolve the problem • must have acquired the appropriate scientific and technical skills to perform the experimental work required and supervise others in its performance and to subject the results obtained to appropriate statistical analysis and critically appraise the results in the light of existing knowledge • must have acquired presentational skills to permit communication, both spoken and written, of research findings for critical appraisal by peers.
2b.1p	• ability to develop the aims and objectives associated with a project	
2b.1p	• 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.1p	• ability to perform the required experimental work ability to produce and present the results (including statistical analysis)	
2b.1p	• ability to critically appraise results in the light of existing knowledge and the hypothesis developed and to formulate further research questions	
2b.1p	• ability to present data and provide a critical appraisal to an audience of peers – both spoken and written	

Achievement of:	• a knowledge of study design to enable a hypothesis to be tested • scientific and technical skills to ensure the achievement of accurate results from which valid conclusions can be drawn • sufficient understanding of the principles and practice of statistical analysis to allow meaningful presentation of results from research • practical experience and an understanding of critical appraisal skills • evidence of participation in basic scientific research and collaborative research in the clinical environment • evidence of continuing oral and written presentation of research findings
Achieved through:	• participation in a relevant supervised research project, e.g. Postgraduate Degree • participation in local research meetings and evidence of supervised and collaborative research initiatives • participation in research and development projects • presentation of the results of research findings, locally and to both the wider clinical biochemistry community and to regional and national specialist metabolic and paediatric groups • self endeavour (eg critical appraisal and literature search) under the guidance of an appropriate Accredited Clinical Scientist in the modality or submodality
Assessed by:	• the locally nominated supervisor (usually a registered Accredited Clinical Scientist) with an assessor from paediatric metabolic biochemistry

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev03 - Include Management Competences

COMPETENCES REQUIRED FOR CLINICAL SCIENTISTS TO ATTAIN STATE REGISTRATION

SPECIALTY : PAEDIATRIC METABOLIC BIOCHEMISTRY

EXPERIENCE:	The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below.

GENERIC COMPETENCES		SPECIFIC COMPETENCES
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:
-	• ability to assess a situation and act accordingly when representing the specialty	• must be able to respond to enquiries regarding the service and to communicate effectively with colleagues within the discipline and in the wider clinical community • must be able to present findings in both written and spoken media through reports, scientific papers, posters, seminars and lectures • must be able to educate and train colleagues and be able to undertake the responsibility of junior colleagues • must be able to communicate sensitively and appropriately with patients, carers and relatives, the public and other healthcare professionals
1b.2p	• ability to respond to enquiries regarding the service provided when dealing with clinical colleagues	
1b.4g	• ability to communicate with patients, carers and relatives, the public and other healthcare professionals as appropriate	
1b.5p	• ability to communicate the outcome of problem solving and research and development activities	
2b.1p 1b.5p	• evidence of presentation of scientific material at meetings and in the literature	

Achievement of:	• an ability to communicate clearly and with confidence to clinical and professional colleagues both within and outside paediatric metabolic biochemistry in both formal and informal settings • an ability to educate and train others both within and outside the paediatric metabolic biochemistry laboratory and to supervise the work of trainee clinical biochemists and others as appropriate, in paediatric metabolic biochemistry. • evidence of continuing experience in the formal presentation of findings and data by verbal and written communication • an understanding of all aspects of information technology pertinent to the service provision and support of a paediatric metabolic biochemistry service and competence in its use to the level required to effectively practice the specialty • an understanding of the ethical aspects of communication with patients and the public
Achieved through:	• participation in appropriate ACB training programmes and in other specific courses and training days provided by other relevant organisations, e.g. BIMDG, National Metabolic Biochemistry Network, • participation in local seminars, clinical meetings, attendance at grand rounds and ward rounds, clinical audit, clinical governance and clinical report authorisation (under supervision) • presentations in oral and written form within and outside the department, through seminars, tutorials, case presentations, posters and peer-reviewed publications • self endeavour (eg competence in the use of word processing, other pc based programmes and the Internet) under the guidance of an appropriate Accredited Clinical Scientist in the modality or sub-modality
Assessed by:	• the locally nominated supervisor (usually a registered Accredited Clinical Scientist) with an assessor from paediatric metabolic biochemistry

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev03 - Include Management Competences

COMPETENCES REQUIRED FOR CLINICAL SCIENTISTS TO ATTAIN STATE REGISTRATION

SPECIALTY : PAEDIATRIC METABOLIC BIOCHEMISTRY

EXPERIENCE:	The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below.

GENERIC COMPETENCES		**SPECIFIC COMPETENCES**
HPC Standards of Proficiency Code – Clinical Scientist	**6-PROBLEM SOLVING**	Be able to deal with the unexpected and thus be able:
2a.2g 2c.1g	• to assess a situation	• must be capable of seeking and establishing (where relevant) relationships between independent pieces of information. • must be able to recognise the unusual and act appropriately • must be able to communicate with others effectively to ensure resolution of a problem in a timely way • must be capable of using the knowledge base pertinent to paediatric metabolic biochemistry • must be aware of the overall operation of a paediatric metabolic biochemistry service and its detail to allow problems affecting the service to be recognised quickly and resolved • must be able to demonstrate personal initiative in problem solving
2b.1g	• determine the nature and severity of the problem	
2b.1g	• call upon the required knowledge and experience to deal with the problem	
2b.1g	• initiate resolution of the problem	
-	• demonstrate personal initiative	

Achievement of:	• a critical understanding of the types of problems (pre-analytical, analytical and post-analytical) associated with diagnostic procedures in paediatric metabolic biochemistry • a detailed knowledge of the operation of the service • comprehensive communication skills to permit collaboration and direction of laboratory colleagues • a detailed knowledge of paediatric metabolic biochemistry and competence to retrieve pertinent information from the literature and appropriate databases
Achieved through:	• participation in appropriate ACB training programmes and in other specific courses and training days organised by other relevant organisations, e.g. BIMDG, National Metabolic Biochemistry Network • participation in local seminars and clinical meetings, attendance at grand rounds and ward rounds, clinical audit, clinical governance and clinical report authorisation • attendance at departmental management meetings • involvement, under supervision, in problem solving within the laboratory • self endeavour , under the guidance of an appropriate Accredited Clinical Scientist in the modality or submodality
Assessed by:	• the locally nominated supervisor (usually a registered Accredited Clinical Scientist) with an assessor from paediatric metabolic biochemistry

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev03 - Include Management Competences

COMPETENCES REQUIRED FOR CLINICAL SCIENTISTS TO ATTAIN STATE REGISTRATION

SPECIALTY : PAEDIATRIC METABOLIC BIOCHEMISTRY

EXPERIENCE:	The candidate should be able to demonstrate that he/she has worked in an environment that has enabled the individual to receive training and gain experience relevant to the competences set out below.	
GENERIC COMPETENCES		**SPECIFIC COMPETENCES**
HPC Standards of Proficiency Code – Clinical Scientist	**7-MANAGEMENT**	Be able to demonstrate an understanding of management principles and techniques, including the following:
1a1.g	• Understanding of the legal and ethical boundaries of the modality, and the ethical aspects of scientific research.	• 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.
1b.1g, 1a.5g	• Ability to recognise the limits of personal practice and when to seek advice.	
1a.6g	• Ability to manage personal workload and prioritize tasks appropriately.	
2c.2g. 1a.3g	• 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.3g	• Ability to contribute effectively to work undertaken as part of a multi-disciplinary team	
	Ability to supervise others as appropriate to area of practice. Understanding of the role of appraisal in staff management and development.	
1a.7g, 1a.8g	• Understanding of the need for career-long self-directed learning and the importance of continuing professional development.	
3a.3g	Understanding of the need for, and ability to establish and maintain, a safe practice environment.	
	• 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.	
Achievement of:	• 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	

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev03 - Include Management Competences

SPECIALTY : PAEDIATRIC METABOLIC BIOCHEMISTRY

Achieved through:	• a structured taught element (eg approved MSc course or approved lecture programme), participation in appropriate training programmes and local courses on general, personnel and financial management, health and safety, audit, etc • participation in local seminars and meetings, attendance at clinical audit meetings and clinical governance committees. • attendance at departmental management meetings • involvement, under supervision, in management within the laboratory • mentoring by an experienced practitioner
Assessed by:	• the nominated local supervisor and appropriate professional body external advisor/tutors

Created: 1 November 2003
Modified: 2 June 2006
Reference: Specific Competences - Paediatric Metabolic Clinical Biochemistry
Version: Rev03 - Include Management Competences