

A Framework of Competences for Level 3 Training in Paediatric Immunology, Infectious Diseases and Allergy

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FOREWORD

I am very pleased to present this final stage, Level 3, of our Framework of Competences in Paediatrics. This level 3 document builds on the two preceding frameworks we have published, for Basic Specialist Training and for Core Higher Specialist Training, now re-named as Levels 1 and 2. The emphasis is firmly on the achievement of competences and not on a time-based training programme. From August 2007 all trainees will enter specialty training within the framework outlined in the Modernising Medical Careers initiative. Achievement of these competences will determine a trainee's progress through the specialty training programme.

The development of this Level 3 framework, with our fifteen sub-specialty curricula, has represented a huge amount of work. I would like to thank all those chairs and members of our College Specialist Advisory Committees (CSACs) who have shown such commitment and support to this project. In particular, we would like to thank Dr Edward Wozniak and Dr Gabrielle Laing, Chairs of General Paediatrics and Community Child Health CSACs respectively, who have been involved in the development of the competences at all three levels.

The College Officers responsible for training have guided and supported this work unstintingly for the last eighteen months and I would like to thank Dr Mary McGraw, Dr Claire Smith and Dr Ian Doughty for their commitment and involvement in the project. In addition, we would like to thank Kim Brown for the development and co-ordination of this work.

These documents have been prepared for submission to PMETB in July 2006 and we hope to publish them, subject to their approval, by Christmas 2006.

Patricia Hamilton
President, Royal College of Paediatrics and Child Health
1 July 2006

Section 1 Introduction

Who is this book for?

It is for doctors at Level 3 in their training in Immunology, Infectious Diseases and Allergy, their tutors and educational supervisors.

Why do I need it?

The book gives you and your tutors guidance about the areas you need to cover during your training. It gives a clear picture of what you have to have achieved by the end of this stage of training, before you become a consultant. You need this book as it forms the basis of your assessment at the end of Level 3 Training.

How do I use the book?

You can sit down with the book on your own and use it to help you identify areas of practice that you need to work on and those areas in which you feel fairly confident. You can talk to your tutor about the balance of your experiences and look for ways to ensure that you cover all the areas you need to.

Progression

This is the final stage in your training as a paediatrician. The competences you gained during Level 1 (Basic Specialist Training) and Level 2, Core Higher Specialist Training have formed the basis for your progression into Level 3 training and on to a Consultant post. Table 1 (page 9) illustrates this progression through your training.

A note about the format of this document

This framework sets out the competences that you need to achieve by the end of Level 3 Training. These build on and develop statements of competence set out for Levels 2 and 3. You are expected to work from all three documents throughout this final stage of your training to ensure that you maintain and continue to develop areas of competence already acquired as well as developing new ones.

Sections 2 and 3 present new statements of competence for Level 3 only, in order to keep the focus clear. Trainees will need to refer back to previous documents for Level 1 and 2 competences in General and General Clinical competences

A note about assessment

The statements in this book have been expressed as *learning objectives*. These are the focus of your training.

When it comes to your assessment, at the end of this phase of your training, we will want to know how *well* you have achieved these objectives and to be confident that you are fit to practise as a Paediatric Consultant. This is what we mean when we talk about your *competence*. So while here you may have, for example, a number of detailed objectives relating to consultation skills or communicating with children, in your assessment we will want to see how you bring all these together and how competent you are overall in your communication skills. This document is not intended as an assessment document but to support training. The assessment of your competence will be by work-based assessments already in use and currently being developed.

Working group:

Kim Brown	Training and Assessment Adviser
Ian Doughty	Officer for Level 3 Specialist Training
Gabrielle Laing	Chair, Community Child Health Specialist Advisory Committee
Mary McGraw	Vice-President for Training and Assessment
Claire Smith	Donald Court Fellow
Edward Wozniak	former Chair, General Paediatrics Specialist Advisory Committee

Progression in the Professional Development of a Paediatrician

During BST	During HST	Continuing development as a consultant
<i>Acquires fundamental knowledge base</i>	<i>Applies knowledge base to provide appropriate clinical care</i>	<i>Evaluates knowledge and modifies clinical care pathways to enhance patient care.</i>
<i>Acquires clinical examination and assessment skills and applies these in clinical practice</i>	<i>Analyses clinical findings to derive appropriate differential diagnosis and management plans.</i>	<i>Evaluates assessment findings; refines and modifies management plans.</i>
<i>Acquires all basic technical skills and basic life support</i>	<i>Proficient at all basic technical procedures, some complex procedures and provides advanced life support.</i>	<i>May relinquish some skills in these areas dependent on area of clinical practice. May acquire specialty specific skills.</i>
<i>Performs allocated tasks and begins to plan tasks</i>	<i>Plans and prioritises tasks appropriately.</i>	<i>Increasing expertise with evaluation of priorities and appropriate delegation across a wide range of professionals.</i>
<i>Performs allotted teaching tasks</i>	<i>Plans and delivers teaching to trainees and other professionals. Develops peer mentoring skills.</i>	<i>Plans and modifies curricula. Performs assessment and appraisal. Able to provide mentorship.</i>
<i>Aware of management issues</i>	<i>Develops management skills and able to take responsibility for a defined project. Contributes to Committees.</i>	<i>Can negotiate and deal with conflict. Can contribute to and lead committees. Evaluates and modifies management structures.</i>
<i>Performs allocated audit projects and understands the audit cycle</i>	<i>Designs audit project and understands risk management. Able to write appropriate clinical guidelines. Understands the Clinical Governance implications</i>	<i>Facilitates audit, and evaluates results. Evaluates guidelines and ensures implementation of appropriate changes</i>
<i>Understands the principles of critical appraisal and research methodology</i>	<i>Able to appraise the literature critically and apply to clinical practice</i>	<i>Able to evaluate critical appraisal performed by others. Able to lead research projects and support others in research.</i>
<i>Works in multi-professional teams</i>	<i>Able to take the lead and accept leadership from other members of the multi-disciplinary team</i>	<i>Evaluates and modifies multi-professional team-working</i>

DRAFT

What is a Paediatrician?

Paediatricians have a detailed knowledge and understanding of diseases in children. They are skilled in looking at health and ill-health in babies, children and adolescents, and at specific health issues, diseases and disorders related to these stages of growth and development. They develop expertise in practical procedures specifically related to the good clinical care of small babies and children. Paediatricians work in multi-disciplinary teams and with colleagues from a wide range of professional groups in hospitals, general practice and in the community, in social services and schools and with the voluntary sector. They have strong communication and interpersonal skills and take on a variety of roles within their different communities of practice. They share expertise effectively and assume the responsibilities of teaching, leadership and management roles where appropriate. They work with colleagues to ensure consistency and continuity in the treatment and care of children and young people in all aspects of their well-being. They are committed to a policy of advocacy for a healthy lifestyle in children and young people and for the protection of their rights.

Paediatricians are doctors who have a particular compassion and respect for children, young people and their families and enjoy working with them. They have an expert understanding of the ways in which illness affects the child, the parents and the rest of the family and are skilled in the management of emotionally complex family situations. They show patience and sensitivity in their communications with children and their families and a particular ability to explore each individual's perspectives of a problem. They are aware of religious and cultural beliefs that parents might hold about the treatment of their children. They know how to respond in these cases, when to seek support and where to find legal and ethical guidelines to support their practice.

Paediatricians ensure that they are up-to-date in their practice and endeavour to promote evidence-based medicine where possible. They are keen to develop innovative approaches to teaching in paediatrics and to research. They are committed to the highest standards of care and of ethical and professional behaviour within their specialty and within the medical profession as a whole. Central to their work is the

principle that all decisions should be made in the best interests of the child or young person in their care.

Contexts for Learning

In drawing up this framework of competences, we have envisaged a wide range of opportunities in which trainees will learn. They will be expected to work on their own, using databases and electronic libraries to research particular conditions or areas of professional practice. This work might be in preparation for a clinic, or a presentation to a group of trainees and supervisors. Trainees may engage with a distance-learning programme in order to develop greater expertise in an area that interests them or that they need to strengthen. Supervisors will need to ensure opportunities for trainees who have undertaken independent study of this kind to share their learning with others. It is through teaching about something you have read or learned or understood differently that learning is consolidated and questioned.

Feedback is essential at all stages of the teaching and learning process. Even in the course of a lecture or on a ward round trainees can communicate important messages about their learning needs through facial expressions and body language as well as in their answers to questions. Tutors need to be ready to pick up on these, to seek out actively trainees' responses to their teaching so that they can make adjustments accordingly and ensure that effective learning takes place.

As well as independent study, trainees will find themselves in a number of different communities of practice. In many cases, their learning will result from shared discussion around the diagnosis of a condition, for example, or the identification of an injury. Experienced colleagues from a range of disciplines may join a specialist team, each sharing their expertise, in order to come to a safe diagnosis or decision about how to proceed, for example in the case of suspected abuse. Trainees need to be encouraged to join these discussions so that they develop confidence in their communication skills with colleagues and in their ability to contribute to clinical decision-making.

Supervisors need to be aware of the importance of asking questions in these situations and of the most effective way to do this, so that trainees are fully engaged and learning as they listen. Closed and open questions have their place, and explicit educational strategies such as ‘scaffolding’ are essential. The teacher takes the learners, step by step, from their initial level of understanding of a condition or a process, for example, to a deeper or more extensive understanding, through a formal cycle of informing, questioning, informing, testing out and consolidating new information. Ward rounds and clinics offer good opportunities for this kind of interaction, with individual trainees and groups. The exchange may be brief or sustained and it is the close focus on understanding which gives this teaching technique its power. Trainees are also encouraged to write a reflective log and it is important to make clear that this needs to go beyond a narrative of events to an analysis of the process of learning they are experiencing. This, in turn, will equip them well to become teachers themselves of less experienced colleagues.

The college is committed to an explicit educational approach. Identifying contexts for learning is the first step. But it is important to go beyond this to a consideration of the way in which different contexts influence the teaching and learning that take place or that are required. It is helpful to be able to identify apprenticeship models, or experiential learning but these alone do not tell us much about the teaching and learning process. The curriculum sets out *what* is to be learned and we know *where* these things will be learned. But it is also essential to understand *how* teachers and trainees will learn.

With the completion of the curriculum, the college is now working on resources to support the teaching and learning of its contents and on guidance for trainees and supervisors on the pedagogical process of training in Paediatrics.

For an overview of teaching and learning in postgraduate medicine, see Liberating Learning (COPMED, 2002).

Section 2 General Competences

Knowledge and Understanding

Substantial re-wording or new statements of competence for Level 3 Training

- understand the impact of physical illness on mental functioning, for both children, young people and their parents and the effect of each upon the behaviour and functioning of the other
- understand the impact of relations and mental health upon a child's or young person's current and past emotions and behaviour
- understand the impact of culture and ethnicity in presentations of physical and psychological conditions
- know, understand and be able to compare and contrast medical and social models of disability
- understand the relationship between local health, educational and social service provision
- know about the agencies, both statutory and voluntary, that can provide general and condition-specific support to children, adolescents and their families in coping with their health problems
- know the objectives of paediatric follow-up
- understand and take account in their practice of risk issues to themselves and others, including those related to personal interactions, and bio-hazards
- have a working knowledge of risk assessment and its application to personal, professional, clinical and organizational practice
- understand and take account in their practice of measures to reduce clinical risk
- know how relative and absolute risks are derived and the meaning of the terms predictive value, sensitivity and specificity in relation to diagnostic tests
- know the legal and ethical guidelines to support their work and where to find more information when required
- be aware of the multidisciplinary investigation of sudden unexpected death in infancy

- understand the management of bereavement and be aware of national guidance documents on this
- understand the purpose of post-mortem examinations and know about procedures
- understand the process of bereavement in children and families and recognise abnormal grieving patterns

Competences specific to speciality

By the end of Level 3 Training, trainees with an emphasis on Immunology and Infectious Diseases will:

- know and understand the ontogeny of the immune response in children
- know and understand the classification of immuno-deficiencies
- know and understand the clinical manifestations of the different types of immuno-deficiency
- know and understand the diverse conditions and treatments which result in secondary immuno-deficiencies
- know and understand the pathophysiology and the principles of treatment of allergic and auto-immune disorders

- know and understand the basis of the immune system including the innate and specific adaptive systems
- understand the developmental aspects of immunity and their relevance to infectious susceptibility in infants and young children
- understand the rationale underlying immunisation strategies in children, including active and passive immunisation
- understand the development and modes of action for active and passive immunisation
- know about routine immunisation schedules as well as immunisation in special situations, for example immunisation of the immuno-compromised host
- understand the mechanisms of auto-immunity
- understand the different types of infection, which are more common with different kinds of immunodeficiency
- know when to use antimicrobial prophylaxis, and which treatments to use
- know when to use immuno-modulatory therapy, and which treatments to use

- know about new and emerging infections, as well as, currently “unclassified” diseases with a possible infectious aetiology such as Kawasaki’s Disease or Chronic Fatigue Syndrome
- know the principles and detail of epidemiology of infectious diseases and be able to apply them
- know and understand how to investigate and manage infections with specific microorganisms
- know and understand about specific infections in the immuno-compromised child
- know and understand the complexities of the relationship between the host and infecting organisms
- know and understand the management of situations where the host immune response to infection has triggered a pathogenic inflammatory response
- know and understand the management of situations where the host inflammatory response, has been triggered by a non-infectious condition
- know about the investigation and management of infections in different human situations, such as zoonoses, occupational exposures, nosocomial transmissions, travel acquired infections and bioterrorism

By the end of Level 3 Training, trainees with an emphasis on Allergy will:

- understand the cellular and molecular pathology of common allergic diseases
- understand the epidemiology, clinical history and natural history of common allergic conditions
- know and understand the ontogeny of the allergic immune response in early life
- know and understand basic allergic mechanisms
- know and understand local tissue responses in allergic diseases
- know and understand the immuno-pathogenesis of the immediate and late phase allergic response
- know and understand the way in which allergy, allergen exposure and infection interact and manifest as disease
- know and understand the relationship between immuno-deficient states and allergic disease

- know about primary and secondary prevention of atopic disease
- know and understand about cross-reactive antigenic determinants and know common cross-reactivities
- know and understand the use and limitations of skin-prick testing and measurement of total and specific IgE
- know the value of diagnostic allergy testing set against the advantages and problems of direct organ challenge
- know about alternative allergy testing and methods of treating allergies
- know and understand immunological mechanisms of immunotherapy
- know and understand indications and contra-indications for specific allergen immunotherapy
- be aware of different allergen preparations and immunotherapy protocols

(see Good Medical Practice (GMC, 2001) - Good Clinical Care: 2, 3; Delegation and Referral: 45, 46.)

Skills

Substantial re-wording or new statements of competence for Level 3 Training

- recognise the breadth of different presentations of common disorders
- recognise features of undifferentiated illness which suggest serious or unusual pathology and initiate the appropriate clinical response with appropriate urgency
- recognise the diseases and host characteristics which make certain presentations life-threatening and manage these situations with vigilance and appropriate urgency
- be able to recognise when both physical and psychological problems are present and when more than one condition or disorder may be present
- be able to assess and manage co-morbidities associated with the range of paediatric presentations
- take a history from a child, young person and parent of the presenting difficulties to acquire information in sufficient breadth and depth in a range of possible symptom areas to allow accurate formulation of the problem

- be able to undertake an assessment of the mental state of children and young people, taking into account their age and stage of development and know whether they have the skills to help them and when to seek more expert paediatric, mental health or psychiatric assessment
- have developed observation skills to support their interpretation of children's or young people's developmental levels and possible physical signs when they are unable to co-operate with formal assessments
- be able to supplement clinical assessment with standardised instruments or questionnaires
- know when to gather information from other professionals eg those working in education, social work or from others who see the child in a variety of settings
- be able to seek the views of children and young people, whatever their illness, regarding individual care and service planning, using expert resources appropriately
- be able to make a decision on the 'most likely' diagnosis and discuss this effectively with children and young people and their parents or carers, and with other colleagues, in the context of a plan of investigation and management
- be able to formulate a management plan for complex cases
- be able to review and modify a management plan as appropriate and know when to request help from senior colleagues or other services
- be able to take responsibility for the longer-term management of common acute and chronic cases leading or working with the multi-disciplinary and multi-agency teams, sub-specialists or networks as appropriate
- have developed expertise in practical procedures specifically related to the clinical care of small babies and children, and young people
- be able to develop and work within care pathways
- be able to manage and know how to obtain support for the consequences of chronic illness for a child, young person and their family
- be able to work effectively in multi-disciplinary teams and with colleagues from a wide range of professional groups
- be able to interact effectively with professionals in other disciplines and agencies and from the voluntary sector

- be aware of their role in the team and of their impact in the team
- have developed skills in recording consultations accurately and sensitively whilst maintaining a good rapport with the young person and family
- have developed a wide range of effective age-appropriate communication skills specific to their work with babies, children, young people and their families
- have developed credibility in their relationships with children, young people and their families, and with colleagues through their knowledge and skills and experience in clinical practice and in their ability to work independently
- have developed strategies to manage a child's or young person's anxiety and personal anxieties
- have developed basic behavioural management skills with parents, children and young people and with other professional colleagues
- be able to recognise, acknowledge and manage different levels of parental anxiety
- be able to assess patterns of relationships and functioning within a family and how these might impact on a child's or young person's illness, seeking professional advice where appropriate
- have developed effective skills in the management of emotionally complex family situations
- be able to recognise indicators of stress or mental health problems in family members and communicate appropriately with relevant professionals
- be able to remain calm in stressful or high-pressure situations and take a timely, rational approach to the problem
- be able to approach new situations which require good clinical judgement with an analytic and informed approach
- show confidence and independence in decision-making in the care of patients
- be able to apply effectively to their practice the knowledge and understanding acquired during training
- have developed a reflective approach to their practice, with an awareness of their level of expertise and limitations and their development needs
- show an ability to learn from their previous good practice, and from clinical errors

- be able to practise evidence-based medicine and understand and analyse critically its limits
- be able to understand the limitations of guidelines, how to use guidelines effectively and when it is appropriate to work outside guidelines
- have developed skills to deal with issues of confidentiality and stigma associated with the presenting difficulties and family background issues
- be able to discuss an assessment of the psychosocial health of a child or young person with the multi-disciplinary team while respecting patient confidentiality

Competences specific to speciality

By the end of level 3 Training, for those training in Immunology and Infectious Diseases trainees will:

- have the knowledge and skills to be able to assess and initiate acute and long-term management of patients presenting with immunological, infectious and allergic conditions
- be able to investigate and manage infections with specific micro-organisms
- be able to manage auto-immune disorders in children and young people
- be able to investigate and manage infection and/or inflammation of specific organ systems
- be able to use appropriate treatments for infectious agents, including antibacterials, antivirals, antiretrovirals, antifungals, and anti-parasitic agents
- be able to investigate and manage systemic infections and/or inflammation, including sepsis and toxic shock
- have experience in the management of HIV in infants and children, and be able to manage HIV in pregnancy to prevent transmission to the fetus
- be able to investigate and manage infections of the immuno-compromised host including those undergoing bone marrow transplantation and or solid organ transplantation
- be able to investigate and manage fever of unknown origin
- be able to recognise the different patterns of clinical presentation of primary immunodeficiency disorders and understand the basis for laboratory testing for these disorders
- be able to investigate and manage infections of the foetus and newborn

- be able to investigate and manage the protean presentations of tuberculosis in a child and its contacts

By the end Level 3 Training, for those training in Allergy trainees will:

- be able to manage, investigate and follow-up patients presenting with allergic conditions
- be able to demonstrate and teach skin prick and intradermal testing using solutions, anaesthetic drugs, antibiotics and prick-prick testing
- be able to assess and advise on the future risk of anaphylaxis and allergic reactions and facilitate an appropriate management plan by liaising with community teams
- be able to identify factors which exacerbate acute atopic conditions, to advise patients and families appropriately about allergen reduction and avoidance at homes and in schools
- be able to advise on the appropriate use of adrenaline and demonstrate the correct use of adrenaline auto-injectors
- be able to compile management plans for children at risk of anaphylaxis and ensure that mechanisms are in place to allow them to be followed in the community
- recognise the role of allergy in polysymptomatic illness and behavioural problems, investigate and adjust management plans appropriately
- be able to co-ordinate local support for children at risk of anaphylaxis at home and in schools be able to advise about the safety and efficacy of immunotherapy injections
- be able to administer immunotherapy injections safely, including side effect monitoring and dosage adjustment
- be able to treat local and systemic reactions following immunotherapy injections

(See Good Medical Practice (GMC, 2001) - Good Clinical Care: 2,3; Maintaining Trust: 19; Working with Colleagues 34, 36; Probity: 50.)

Values and Attitudes

Substantial re-wording or new statements of competence for Level 3 Training

- be committed to a policy of advocacy for a healthy lifestyle in children and young people and for the protection of their rights
- understand national and contribute to local initiatives aimed at reducing inequalities in child health and well-being
- practise with compassion and respect for children, young people and their families and act as a role model for others
- adopt an open-minded approach to equality and diversity in their practice
- be aware of the effects of social, cultural and religious context and conflict upon families
- understand the importance of cultural diversity and the difficulties where religious and cultural beliefs that parents might hold about the treatment of their children are in conflict with good medical practice and know when legal and ethical guidelines will support your management or view of the situation
- have developed strategies to manage relationships where health-care beliefs might cause conflict
- be able to advise patients appropriately on debates and controversies in health care
- be sensitive to the effects of stigma on children and families in relation to medical conditions
- be able to work effectively with children, young people and parents or carers, to agree and help them follow management plans
- be able to work effectively with young people who may have or may develop health care beliefs which are in conflict with those of parents or professionals, and know when legal and ethical guidelines will support your management or challenge of the situation
- be able to accept complex and difficult challenges
- show an understanding of the importance of ensuring a healthy balance between professional and domestic priorities
- have the willingness to acknowledge and reflect on the way in which they may, influenced by their earlier life experiences, have an impact on

perceptions of and interactions with young people, their families and professionals

Competences specific to speciality

By the end of Level 3 Training, for those training in Immunology and Infectious Diseases, trainees will:

- understand the effects of stigma on children and families in relation to infections, such as HIV, TB, and sexually transmitted infections
- develop a non-judgmental approach to the management of infectious diseases such as HIV and sexually transmitted infections
- understand the controversies in relation to partner notification after exposure to infections such as HIV and sexually transmitted infections
- understand the sensitivities in relation to primary genetic disorders of the immune system

By the end of Level 3 training for those training in Allergy, trainees will:

- understand and be able to advise parents and young people on current controversies in allergy prevention, such as allergen avoidance in pregnancy and infancy and the hygiene hypothesis

(See Good Medical Practice (GMC, 2001) - Good Medical Practice: 1; Good Clinical Care: 5; Maintaining Trust: 19; Working with Colleagues: 36.)

Teaching and Research

Substantial re-wording or new statements of competence for Level 3 Training

- have developed a range of effective teaching and learning skills in a range of clinical contexts
- be able to identify learning needs in a wide range of professionals and build on this in their teaching
- be able to elicit and act upon feedback on content and presentation of teaching
- be able to participate in teaching and research on topics within their specialty and in related areas
- conduct research with honesty and integrity, seeking ethical approval where appropriate and safeguarding the interests of patients

- demonstrate an understanding of ‘good clinical practice’ for all aspects of the conduct of clinical trials
- demonstrate an understanding of the role of ethics committees for clinical studies and the process of ethics applications
- understand the techniques used in epidemiological studies
- demonstrate an understanding of how to perform and interpret systematic reviews, how they differ from narrative reviews and understand the principles of meta-analysis
- understand the difference between population-based assessments and unit-based studies and be able to evaluate outcomes for epidemiological work
- be able to develop clinical guidelines, understand how they are produced nationally and how these should be used to guide their own practice
- be able to evaluate research effectively in paediatrics and child health
- take responsibility for the training, supervision and assessment of undergraduates and trainees and other professionals such as nurses, teachers and social workers in and outside the specialty
- have developed skills in the presentation of information relevant to their clinical practice for a range of audiences, including spoken presentations at meetings, written information for children and families and training materials for different groups of colleagues
- be able to lead departmental teaching programmes, including journal clubs
- be willing to accept mentoring as a positive contribution to their own professional development
- be willing to learn from others, to discuss cases openly and to seek advice as appropriate and as necessary

(See Good Medical Practice (GMC, 2001) - Teaching and Training, appraising and assessing: 13, 14, 15, 16; Probity: 51.)

Leadership and Management

Substantial re-wording or new statements of competence for Level 3 Training

- be able to provide specialist support to hospital- and community-based paediatric services including primary care

- be able to take on a leadership role in a multi-disciplinary team when appropriate, for example by representing the health needs of a child, young person and their family at a discharge meeting, and know when it may be inappropriate to do so
- be able to work effectively in multi-agency teams, for example, with social workers and teachers, and have developed an awareness of their own role within the team and of the skills and expertise of others
- be confident to make decisions within a team and be aware of their impact on other team members
- be able to advise the team providing advanced life support and to liaise effectively with anaesthetic and PICU staff
- demonstrate effective leadership skills in clinical situations, for example through their ability to organise, prioritise and delegate, and be able to help others to develop these skills
- have skills and strategies to manage conflict effectively
- have understanding and skills to be able to participate effectively in clinical and management meetings
- have developed effective administrative skills including ways to make best use of secretarial resources
- be able to handle enquiries from the press and other media effectively
- recognise their own working preferences and accept different approaches of colleagues
- know how to respond appropriately to health service targets and be able to participate in the development of services
- be able to work with stake-holders so that a client- or patient-centred service is created and sustained
- have gained an understanding of national and local regulatory bodies, particularly those involved in standards of professional behaviour, clinical practice and education, training and assessment
- understand the value and limitations of evidence-based medicine

Competences specific to the specialty

By the end of Level 3 Training, for those training in Immunology and Infectious Diseases trainees will:

- be able to work collaboratively with the whole range of generalists and organ sub-specialists in managing the complications or associated problems of immunological, infectious, allergic disorders
- be able to work with specialists from other disciplines such as genetics and obstetrics to facilitate prenatal diagnosis of primary immunodeficiency disorders
- be able to work with research groups to allow translation of new developments into clinical practice in managing children with immunological disorders and infections

By the end of Level 3 training for those training in Allergy, trainees will:

- be able to run an effective immunotherapy service
- be able to run a food challenge service effectively

(See Good Medical Practice (GMC, 2001) - *Working with Colleagues: 34, 35, 36, 39, 42.*)

Personal Commitment to Professional Standards

Substantial re-wording or new statements of competence for Level 3 Training

- understand the duty of all professionals working with children to report concerns about child protection issues to Social Services
- be able to contribute to the implementation of national and local health policy initiatives
- know and follow key legal and ethical guidelines relating to confidentiality, consent to treatment, the right to refuse treatment, continuing changes in the law and its interpretation and be aware of variability in Scotland, Wales and Northern Ireland
- be able to generate local and evaluate national clinical guidelines and protocols in paediatric practice and public health and recognise the individual patient's needs when using them

- participate and take responsibility for clinical governance activities, and encourage and support colleagues in their participation
- be able to carry out audit in a range of settings in partnership with all stakeholders in order to identify best practice
- know about and participate in clinical and research special interest groups relevant to their specialty
- know when in the interest of the child it may be necessary to break confidentiality
- know how to find, review and maintain relevant knowledge in their specialty in order to maintain their fitness to practise
- ensure that they are up-to-date in their practice and promote evidence-based medicine where possible
- be able to evaluate their own performance critically
- be open about sharing and reviewing their practice with others
- be aware of local processes for dealing with and learning from clinical errors and to be able to work within them

Competences specific to the specialty

By the end of Level 3 Training, for those training in Immunology and Infectious Diseases and Allergy, trainees will:

- know about and have participated in specialist organisations for children with allergy, immunodeficiency and infections (e.g. BPAIIG, BSACHI, PIA, ESPIDESID)

(See Good Medical Practice (GMC, 2001) - 1; Maintaining Good Medical Practice: 10, 12; Relationships with Patients: 17; Working with Colleagues: 35; Dealing with Problems in Professional Practice: 26, 27, 29, 30. Probity: 58.)

See also for all of these sections: Good Medical Practice in Paediatrics and Child Health,² London: Royal College of Paediatrics and Child Health (2002).

Communication Skills in Paediatrics

²*Good Medical Practice in Paediatrics and Child Health*, London: Royal College of Paediatrics and Child Health (2002). Online at www.rcpch.ac.uk/publications/recent_publications.html

Substantial re-wording or new statements of competence for Level 3 Training

- understand the importance of directing communications to the baby, child or young person as well as to parents and carers
- have developed skills to establish a child's or young person's and family's understanding of a situation and to build on this effectively in discussion about the condition and its management
- understand the importance of seeking the views of all children and young people to inform decisions about their individual care and to encourage their participation in their care
- encourage children and young people to participate in their individual care and in the development of services, using expert resources appropriately
- have effective active listening skills in consultations with children and young people and understand the need to respect their views in accordance with their age and maturity and to respond appropriately where, for example, a child or young person is felt to be vulnerable
- have developed effective skills in working with children, young people and families to achieve concordance in planning management and treatment, enabling children and young people to maximise control over their illness and its management
- be able to respond appropriately, and know where to find assistance, in cases where a child, young person or family may not all speak English or where there is a sensory impairment that may affect understanding
- be able to respond to babies, disabled children or young people who may not be able to express themselves verbally, including those who might be in pain or distress
- be able to recognise, interpret correctly and respond to verbal and non-verbal cues from children, young people and parents
- have developed observation skills to support their interpretation of children's or young people's developmental levels and possible physical signs when they are unable to co-operate with formal assessments
- demonstrate appropriate responses and empathy for children, young people and their families experiencing difficulty and distress

- have developed a range of language strategies, such as the use of metaphor or images which relate to everyday life, to explain clearly to a child or young people and their family, their symptoms, condition or treatment, their feelings or behaviour
- be able to counsel parents about serious conditions and abnormalities within their area of expertise
- have effective strategies for careful and appropriate use of language in difficult and challenging circumstances, for example, at the birth of a baby with disabilities or where there is a conflict with colleagues
- be able to discuss the indications, benefits and adverse events of a procedure to patients, relatives and carers in a manner that will allow informed consent
- have developed a range of approaches to communicating the breadth of diagnostic possibilities and other clinical information to children, young people and their families so that consent is always informed and the plan and progress of treatment understood
- be able to advise children, young people and their families about the importance of concordance and about medication interactions and side-effects
- be able to convey and share effectively difficult or bad news, including end-of-life issues, with children, young people, parents or carers and help them to understand any choices they have or decisions to be made about ongoing management
- be able to prepare and discuss with parents, carers and other professionals “Do not attempt resuscitation” policies as appropriate, taking due account of the Human Rights Act (1998), ensuring that the best interests of the child are held as paramount at all times
- be able to seek consent for post-mortem examinations and communicate effectively with the Coroner
- be able to confirm with children, young people and their families their understanding of a situation from what has been said and written and clarify this as appropriate
- be able to explain the role of other professionals and agencies to children, young people and their families

- have the confidence to be firm and diplomatic in difficult situations, for example, when dealing with angry parents
- understand the limits of their competence, particularly in stressful situations and be willing to seek help in managing sensitive and complex situations
- be able to demonstrate to trainees how to communicate a diagnosis and prognosis effectively to children, young people and their families
- be able to demonstrate and explain to trainees strategies used to conduct effective consultations with babies, young children, adolescents and their families
- have effective skills in written communications for a range of audiences, for patients and their families, colleagues and other professional organizations
- ensure that spoken and written communications with patients and families are presented in clear, straightforward English, avoiding jargon whenever possible
- ensure that written information in the form of booklets, leaflets, information sheets and websites support verbal communications wherever possible
- ensure that written communications summarise accurately discussions with children, young people and parents or carers, and, to avoid confusion and anxiety, do not include information that was not part of the original discussion
- be able to liaise with parent support and self-help groups when necessary
- be able to prepare a court report as a professional witness and develop the skills to present such material in court
- know how to write reports about alleged abuse of children and young people for social services or the courts
- be able to write reports that explain the condition of a child or young person to non-health personnel working in the courts, social services or education
- be able to use electronic communication media, taking into consideration the principles of confidentiality outlined in the Data Protection Act
- have developed effective professional networks to support clinical practice and other activities, including research, education and management

Section 3 General Clinical Competences

Development

Substantial re-wording or new statements of competence for Level 3 Training

- know the range of patterns of normal development from birth to adulthood
- know and understand the range of children's or young people's psychological and social development, including the normal range and what is outside it
- be able to identify when patterns of development are abnormal and where there may be a risk of abnormality which may only become apparent with time
- know the causes of disability, how disability might affect clinical examination and assessment and be able to contribute to a multi-disciplinary approach to management
- understand the severity of the presentation, taking into account normal development in appropriate domains
- know how to institute further assessment and investigation
- know about different modes of screening and health promotion strategies
- understand the ways in which children's or young person's mental health difficulties may present in infancy, childhood and adolescence
- understand the impact of biological factors, including genetic and cognitive factors, on the mental health of children and young people
- understand the impact of other environmental factors (including violence, trauma, neglect, abuse and disruption, wherever this has occurred) on a child's development, mental health and functioning
- be able to assess the effects of recurrent or chronic illness and its treatment on growth, psycho-social, emotional, physical and sexual development and have strategies to minimize adverse effects

Competences specific to speciality

By the end of Level 3 Training in Immunology, Infectious Diseases and Allergy trainees will:

- know the range of normal development of immune competence with age
- know the age and developmental specific susceptibility to infections and allergic conditions

- understand how immune development affects vaccine responses

Emotional development

Substantial re-wording or new statements of competence for Level 3 Training

- understand and recognise somatisation disorders and know how to provide initial management and how to access appropriate support
- recognise pointers to fabricated and induced illnesses and know how to provide initial management and how to access available support
- understand the emotional impact of illness and hospitalisation on children, young people and their families and take action to minimize this impact
- understand how a family's, child's or young person's attitude to the problem and services may have a significant impact on the presentation and its management
- recognise the need for specialised input in cases of serious emotional distress or mental illness and ensure their needs are met within local health provision
- understand the emotional dimensions of eating disorders and recognise and initiate treatment
- be able to assess parenting skills and recognise and respond to indications of unsatisfactory or unsafe parenting
- know how to access help in cases where children or young people of different ages might be deprived of opportunities to play and to learn
- know how to manage common behavioural problems

Social development

Substantial re-wording or new statements of competence for Level 3 Training

- be able to recognise and understand the impact of autistic spectrum disorders and other organic disorders on social development

Educational development

Substantial re-wording or new statements of competence for Level 3 Training

- demonstrate, in all aspects of their practice, an understanding, of the vulnerability of a child or young person with learning difficulties

Growth and Nutrition

Substantial re-wording or new statements of competence for Level 3 Training

- know the reasons for faltering growth, including emotional factors and how to investigate appropriately
- understand and assess normal and abnormal pubertal development and its relationship to growth
- understand the environmental factors contributing to obesity and how these might be altered
- be able to recognise feeding problems and work with parents directly to offer simple advice and to treat co-morbid conditions
- know about the principles and methods and indications for nutritional support and common problems that may arise from invasive methods or refeeding
- be able to identify nutritional deficiencies and growth failure which may occur in children and young people who undergo unsupervised dietary modification

Competences specific to the specialty

By the end of Level 3 Training, for those training in Immunology and Infectious Diseases trainees will:

- be able to manage the nutritional aspects of immunological and infectious conditions in children
- work closely with the dietetic team to manage nutrition in children with immunological, allergic and infectious conditions

By the end of Level 3 training for those training in Allergy, trainees will:

- be able to recommend nutritionally adequate allergen avoidance diets in infants and children

Adolescence

Substantial re-wording or new statements of competence for Level 3 Training

- understand what the specific needs of young people are, in terms of their emotional, mental and physical health, and how these are different from those of children

- know the epidemiology of the main causes of morbidity and mortality in young people
- ensure that young people have access to ‘in-patient’, ‘outpatient’ and other medical services that best meet their needs
- understand why young people harm themselves and respond appropriately to actual or threatened episodes of self-harm in adolescents
- understand the consequences of self-harm and be able to work as part of a clinical network in the management of the young person who self-harms
- be able to discuss sexual health issues including basic contraceptive advice and know how to help the young person access appropriate sexual health or genetic advice
- know about national policies concerning the health care of young people, including those which help to reduce teenage pregnancy
- understand the processes of adolescence including experimental behaviours, learning by experience, achieving independence from the family, and the consequences of these on health and illness in young people
- be able to discuss comfortably with young people important health behaviours such as the use of tobacco, alcohol or recreational drugs, and intimacy and sexual activities together with the promotion of appropriate strategies for these in relation to specific conditions such as asthma, diabetes, cystic fibrosis, physical disability
- understand the particular needs of adolescents with regard to their independence and autonomy, education and work, body image and sexual identity, concordance with medication and risk-taking and understand how these factors may be affected in young people with chronic conditions
- be able to support young people in self-management of both acute and chronic disease where they want to, and have an understanding as to how to best help when the young person cannot or does not want to manage this
- be able to discuss the implications of chronic illness or disability for career options
- where appropriate and at a negotiated time, be able to raise and agree management of end-of-life issues with young people and their families and record conclusions in medical notes

- understand issues around transition from paediatric to adult care in adolescents with chronic conditions and disabilities, and be able contribute effectively to transitional care services
- understand and value the roles of members of the multidisciplinary team in the delivery of a transitional care programme

Competences specific to the specialty

By the end of Level 3 Training, for those training in Immunology and Infectious Diseases trainees will:

- understand the issues for young people growing up with immunological conditions and /or chronic, infections that can affect their sexual development, fertility, pubertal development, cognitive development and mental health
- be sensitive to the sexual and emotional development of young people living with a sexually transmissible disease such as HIV or Hepatitis

By the end of Level 3 training for those training in Allergy trainees will:

- understand how manifestations of allergic disease change during adolescence
- understand the problems experienced by adolescents on avoidance diets and the implications for their social life

Section 4 Specialty-specific Competences in Paediatric Immunology, Infectious Diseases and Allergy

Allergy

- know the specificity, sensitivities and predictive values of skin-testing and in vitro IgE antibody measurement for individual allergens
- be aware that these values vary with the allergen involved, the manufacturer, the purity of the product and the relative content of the allergen
- identify patients who present with symptoms mimicking allergy and know to refer them to other specialists
- know and be able to recognise the relationship between food allergy, eczema, failure to thrive, asthma and rhinitis
- know and understand the role of exposure to animals in the generation of tolerance
- know and understand pet allergy and be able to advise sympathetically about reducing exposure to animals

Anaphylaxis

- ensure that guidelines for the management of anaphylaxis are implemented
- be able to advise about and interpret investigations performed immediately following acute allergic reactions
- be able to identify precipitating causes using ingestion history, gastric aspirate and serial tryptase levels, as appropriate

Food allergy

- know the common and uncommon foods that trigger IgE mediated and non-IgE mediated hypersensitivity reactions
- know the mechanisms of IgE and non-IgE food hypersensitivity reactions, including eosinophilic enteropathy and food intolerances due to pharmacological effects of food and enzyme deficiencies and be able to explain this to patients

- be able to diagnose and manage appropriately food-induced enteropathy, including interpretation of oesophageal pH monitoring and gut histology
- be able to recognise multiple presentations of food allergy, be able to interpret a dietary diary and be able to advise about its management, including the risks and benefits of avoidance diets, use of alternative and hypoallergenic milk formulas and a hypoallergenic weaning diet
- know the indications for food challenges, challenge protocol procedures (open, single blind and double blind placebo controlled) and safety precautions
- be able to use measurements of specific IgE and skin test results to optimise the timing of food challenges
- be able to advise about the safe re-introduction of food following a negative food challenge
- know the relationship and cross-reactivities between food, pollen and food, and latex and be able to advise patients appropriately
- be able to recognise the distinction between food allergy and oral allergy syndrome and advise patients appropriately
- know how to assess future risk of allergic reactions and which patients require the prescription of injectable adrenaline

Eczema

- understand the role of allergen triggers and avoidance in the pathogenesis and management of eczema and be able to advise patients appropriately
- know the role of diet in the pathogenesis of eczema and be able to advise appropriately about dietary modification
- know the role of exposure to airborne allergens in the pathogenesis of eczema and be able to advise appropriately about reducing exposure
- be able to examine and assess the severity of eczema in an affected child
- know the sensitivity and specificity of measuring total and specific IgE and skin testing in children with eczema and be able to investigate them appropriately
- know how to perform patch testing for contact dermatitis and understand the value and limitations and the the potential value and limitations of atopy patch

testing in relation to eczema and food allergy and how to use these investigations appropriately

- be able to manage patients with severe eczema including the use of emollients, anti-inflammatory preparations and wet wraps

Urticaria and angioedema

- be able to manage and investigate patients presenting with an acute exacerbation of angioedema
- be able to identify precipitating causes and advise about future avoidance
- know the definition, causes and exacerbating factors of acute and chronic urticaria and angioedema
- be able to investigate and manage patients with acute and chronic urticaria
- be able to diagnose accurately and manage patients with hereditary angioedema including advice about prophylaxis and peri-operative management
- be competent in performing challenge procedures for children with physical urticaria
- be able to recognise and investigate patients with an underlying vasculitis

Asthma and recurrent wheeze

- be able to identify allergen exposure as a cause of acute exacerbations of asthma
- know the role of allergy testing and allergen avoidance in managing children with asthma and be able to advise families about allergen reduction measures
- know the concept of the unified airway and the importance of the treatment of rhinitis in patients with asthma
- be able to advise about effective methods of reducing exposure to house dust mite
- be able to perform bronchial allergen challenges and to know the indications for using them
- know the value and limitations of environmental sampling for aero-allergens

- be able to perform and interpret spirometry, pulmonary function testing and exercise challenge testing
- be able to recognise, investigate and manage patients with acute and chronic severe asthma including the use of immuno-modulators and anti - IgE
- understand changes in asthma which occur during adolescence including remission and deteriorating asthma control

Rhinoconjunctivitis

- know the definitions of seasonal and perennial disease and exacerbating factors
- know about the aerobiology of pollen
- be able to diagnose accurately allergic rhinitis and conjunctivitis, know the differential diagnosis, management guidelines and principles of therapy
- be able to advise young people and their families about the effective application of eye drops and nasal sprays and identify patients who would benefit from pollen immunotherapy
- be able to perform nasal and conjunctival allergen provocation tests
- know the pathogenesis and management of obstructive sleep apnoea including indications and interpretation of sleep studies
- be able to identify and manage common co-morbidities such as sinusitis and sensory abnormalities of smell and taste
- be able to diagnose the common cross-reacting allergens relevant to the oral allergy syndrome

Venom allergy

- know the clinical features and grading of local and systemic reactions to insect stings
- be able to perform and interpret skin prick tests, using serial dilutions, and measurement of specific IgE
- be able to advise about the avoidance and emergency management of stings and appropriate rescue medication
- know the indications and contra-indications to venom immunotherapy

Drug allergy

- know the management and investigation of suspected drug allergy including allergic reactions to local and general anaesthetics and be able to advise about appropriate alternative drugs
- be able to perform and interpret skin prick tests, intradermal tests and measurements of specific IgE to antibiotics and local and general anaesthetic agents
- know the indications for, limitations of and protocols for drug challenges and desensitisation
- be able to supervise drug challenges and desensitisation procedures

Vaccine reactions

- know the causes and mechanisms of vaccine reactions and be able to advise about further immunisations in children following vaccine reactions

Latex allergy

- know about routes of exposure, risk factors, natural history, aetiology and clinical sequelae of latex allergy
- be able to diagnose latex allergy, including skin prick testing, measurement of specific IgE and provocation tests
- be able to advise about the practical management of patients with latex allergy, including avoidance and use of latex free alternatives; at home, in schools and nurseries, in dental clinics and in hospitals
- know about hospital latex policies and be able to advise about their implementation
- be able to identify cross-reacting latex allergens in common foods and advise patients accordingly

Idiopathic anaphylaxis

- be able to investigate idiopathic anaphylaxis appropriately and exclude common causes

- know the differential diagnosis including exposure to unusual allergens, exercise induced anaphylaxis and systemic mastocytosis
- be able to advise a family with a child at risk of anaphylaxis about prevention, rescue medication and prognosis

Immunology

The Immune System

- know the detailed functioning of the immune system, including the complement system, phagocytic system, humoral and cellular immunity and the molecular and genetic basis of such functioning
- understand the levels of functioning of the immune system at different ages and the relevance to vaccination strategies
- understand the effect of malnutrition and disease on normal immune development
- know the immunological basis of allergic disorders
- know the immunological basis of auto-immune and inflammatory disorders
- understand the basis of immunodysregulatory disorders including haemophagocytic lymphohistiocytosis
- understand the basis of hereditary angioedema and its complications
- understand immune function testing and be able to interpret the results including antibody assays, complement, phagocytic cell, T cell tests
- understand the molecular genetic tests available for the diagnosis basis of primary immunodeficiency disorders
- understand the basis of secondary immune deficiencies including those induced by infections, other disease and drug treatments
- understand the epidemiology, manifestations and basis of treatment for HIV infection in children

Infections in the immunocompromised child

- know the nomenclature, epidemiology, incubation periods, clinical presentations, pathogenesis, diagnostic tests, host response, infection control issues and treatment for the different families of micro-organisms

- recognise the atypical manifestations of common infection and the range of atypical organisms causing infection in the immunocompromised child
- be able to recognise the patterns of lymphoproliferative disorders in immunocompromised children
- know the normal flora found in different sites of the body in infants and children as well as the pathogenic flora
- be able to keep up to date with the literature, and be aware of the constant evolution and discovery of new pathogenic micro-organisms
- have a good understanding of the functioning of a clinical diagnostic microbiology service for different types of infection
- have a good understanding of methodology and limitations of different diagnostic tests for infections including culture, serology, antigen detection and molecular techniques
- understand the principles of quality control in laboratory testing
- understand the principles of infection control within and without the hospital environment
- have experience of working with the infection control team to limit the spread of infection in hospitals
- be actively involved in the development of hospital antibiotic policies in relation to the management of children in hospital
- know how to handle bio-hazardous specimens, and be able to advise

Therapies

- understand and be able to use appropriate antimicrobial prophylaxis in the immunocompromised child
- understand and be able to use the full range of antimicrobial therapies for infections in the immunocompromised child
- have knowledge and experience of the principles and practice of immunoglobulin treatment including the use of intravenous, and subcutaneous treatment routes
- be able to administer immunoglobulin by both intravenous and subcutaneous

- understand the process involved in setting up home therapy with immunoglobulin
- be able to use immunomodulatory treatments including monoclonal antibodies, and growth factors
- understand and be able to manage autoimmune and inflammatory disorders
- be able to use of C1 inhibitor concentrate for hereditary angioedema
- know how to manage acute anaphylaxis
- understand the principles of donor selection, conditioning treatment and complications including infection and graft versus host disease in bone marrow transplantation

Infectious diseases

Micro-organisms

- know the nomenclature, epidemiology, incubation periods, clinical presentations, pathogenesis, diagnostic tests, host response, infection control issues and treatment for the different families of micro-organisms
- have knowledge of the likely pattern of infecting organisms in different clinical situations such as a human or animal bite
- know the normal flora found in different site of the body in infants and children as well as the pathogenic flora
- understand the significance of zoonoses in different situations, and be able to treat appropriately for the most likely infections
- be able to keep up to date with the literature, and be aware of the constant evolution and discovery of new pathogenic micro-organisms
- have a good understanding of the functioning of a clinical diagnostic microbiology service for different types of infection
- have a good understanding of methodology and limitations of different diagnostics tests for infections including culture, serology, antigen detection and molecular techniques
- understand the principles of quality control in laboratory testing

Bacteria

- have an in-depth knowledge of the nature, consequences and treatment of infections with gram positive organisms including: staphylococci, streptococci, diphtheria, anthrax, listeriosis, tuberculosis and other mycobacteria
- have an in-depth knowledge of the nature, consequences and treatment of infections with gram negative organisms including: the many enterobacteria such as salmonella; and the many coccobacilli such as Haemophilus Influenzae
- have an in-depth knowledge of the nature, consequences and treatment of infections with treponemataceae such as borrelia and syphilis
- have an in-depth knowledge of the nature, consequences and treatment of infections with anaerobic bacteria such as clostridium and tetanus

Viruses

- have an in-depth knowledge of the nature, consequences and treatment of infections with DNA viruses such as the parvoviruses, papilloma viruses, herpesviruses and pox viruses
- have an in-depth knowledge of the nature, consequences and treatment of infections with RNA viruses such as the picornaviridae, reoviridae, togaviridae, flaviviridae, orthomyxoviridae, paramyxoviridae, and retroviridae

Atypical Infections

- have an in-depth knowledge of the nature, consequences and treatment of infections with chlamydia, mycoplasma, and rickettsial diseases

Fungal Infections

- have an in depth knowledge of the nature, consequences and treatment of infections with fungi including Aspergillus, Candida, and Cryptococcus

Parasitic Diseases

- have an in-depth knowledge of the nature, consequences and treatment of infections with different human parasites including the protozoa such as malaria, toxoplasmosis, and cryptosporidiosis

Antimicrobial Therapeutics

- have a detailed understanding of the mode of action and pharmacokinetics of antimicrobial drugs in children and infants
- have a good knowledge of the local flora and its antibiotic resistance patterns
- know about resistance patterns of imported organisms
- have a good understanding of the processes of development of resistance to anti-microbials as well as the assessment and development of drug resistance and strategies to manage drug resistant organisms
- have a good understanding of the use of immunomodulating agents including cytokines and growth factors
- know when to use antimicrobial prophylaxis and which treatments to use

Clinical Infectious Diseases

- Host-Microorganism Interactions and the Pathogenesis of Infectious Disease
- know and understand the significance of microbial virulence factors in the evolution of disease
- know and understand the nature and potential pathogenic role of indigenous flora in evolution of human disease
- know and understand the variety of host metabolic responses to infection with reference to how these may improve or aggravate clinical disease
- know and understand the interactions of the host inflammatory and coagulation cascades
- know and understand the pathogenesis of the febrile response to infection
- understand the specific effects of nutrition on infectious disease severity, such as seen with measles infection

Infections of Specific Organ Systems

- be able to liaise effectively with organ specialist paediatricians, radiologists, microbiologists, intensivists, and other therapists in the multi-disciplinary team to effect the best management of specific organ infections
- be able to order and interpret appropriate ancillary diagnostic tests such as MRI scan, or EEGs
- be active in the local development of protocols for the best management of infections of specific organ systems to assist junior colleagues as well as organ specialist paediatricians

Upper Respiratory Tract Infections

- have clinical experience of the management of the diverse infections of the mouth and upper respiratory tract
- be able to differentiate trivial infections from severe infectious presentations such as epiglottitis, croup, and per-pharyngeal abscesses
- be able to recognise and treat complications of simple upper respiratory tract infections such as mastoiditis, parotitis or sinusitis
- be able to treat otitis media and its potential complications
- be able to investigate and treat cervical lymphadenitis, both the chronic and acute presentations

Lower Respiratory Tract Infections

- have clinical experience of the management of the diverse infections of the lower respiratory tract
- be able to investigate the infectious source of respiratory diseases
- be able to manage bacterial and non-bacterial pneumonias
- be able to manage the complications of pneumonia such as effusions, empyemas, and lung abscesses
- be able to manage infants with bronchiolitis and identify those eligible for anti-viral treatment
- be able to investigate and manage the causes of interstitial pneumonitis

- be able to investigate and manage the infectious complications of chronic lung diseases such as cystic fibrosis

Central Nervous System Infections

- have clinical experience of managing the diverse infections of the CNS
- be able to investigate and manage all forms of infectious meningitis including tuberculous
- be able to manage the clinical complications of meningitis such as effusions and empyaema
- be able to diagnose and manage all forms of meningo-encephalitis and their complications
- be able to investigate and manage infections of the spinal cord and its coverings
- be able to manage “post-infectious” complications in the CNS such as Guillain-Barre syndrome, acute demyelinating encephalomyelitis and cerebellitis
- be able to diagnose and manage CNS complications of URTI or facial infections such as abscesses, orbital infections, osteomyelitis of skull bones and thrombophlebitis
- be able to liaise with the ophthalmologist for the appropriate management of ocular infections whether acute or chronic, such as toxoplasmosis

Cardiovascular System Infections

- be able to investigate and manage infections of the different layers of the heart, including infective endocarditis, myocarditis and pericarditis
- be able to diagnose and treat acute rheumatic heart disease as well as manage the long term follow up of such patients along with the cardiologist
- be able to diagnose and treat other vascular infections that may be secondary to intra-venous devices

Genitourinary Tract Infections

- be able to investigate and manage infections of the urinary tract with particular reference to the age of the child and underlying risk factors for infection.

- be able to diagnose and manage complications of UTI infections such as renal abscess, prostatitis
- be able to manage UTIs in children with congenital renal tract anomalies and chronic infections with resistant organisms
- be able to diagnose and manage jointly with the gynaecologist, gynaecological infections in girls. Be able to refer such children and young people to the child protection team where appropriate
- be able to diagnose and manage jointly with the genitourinary specialist sexually transmitted infections in children and adolescents
- be able to refer such children and young people to the child protection team where appropriate

Gastro-Intestinal Tract Infections

- be able to diagnose and manage all forms of infectious diarrhoea as well as their potential complications. Be able to initiate the appropriate contact and control of infection measures for diarrhoeal illnesses
- be able to diagnose and manage the viral hepatitis and liaise with the Hepatology team where appropriate
- be able to diagnose and manage appendicitis, intra-abdominal abscesses, and intra-abdominal sepsis and liaise appropriately with the abdominal surgeons
- be able to diagnose and manage abdominal tuberculosis and liaise appropriately with the gastroenterologist

Musculoskeletal and Skin Infections

- be able to investigate and manage infections of the bones and joints, recognising the problems of antibiotic penetration into bone
- be able to liaise with the orthopaedic team for the best management of these infections
- be able to diagnose and manage bacterial myositis as well as necrotising fasciitis, and liaise with the surgeons to prevent its complications
- be able to diagnose and manage bacterial, fungal, parasitic and viral skin infections; recognising aggravating aetiological factors in the host

Systemic Infections / Inflammations

- be able to recognise, formally diagnose and manage all the viral exanthemas of childhood
- be able to diagnose and manage the complications of the viral exanthemas, such as post Varicella encephalitis
- be able to advise on the incubation periods, exclusion from school/nursery periods, and preventive interventions for other family members of the viral exanthemas
- be able to investigate and manage the child with sepsis and shock
- be able to give antibiotic advice for the individual and for prophylaxis, if appropriate, of other family members
- be able to diagnose and manage toxic shock syndrome with antibiotics and immune modulation
- be able to liaise with intensivists and surgeons for optimal management of such cases
- be able to take an in-depth history, carry out a detailed examination and organise the appropriate diverse range of investigations for the diagnosis of a fever of unknown origin
- be able to liaise with the microbiologist, radiologist, haematologist and other organ specialists, such as the cardiologist to identify the cause of the fever
- be able to recognise when the fever is not due to infection but to another inflammatory or malignant condition

Infections of the fetus and newborn

- be able to support the obstetrician and neonatologist in the diagnosis and treatment of congenital infections such as cytomegalovirus, syphilis or toxoplasmosis
- have an in-depth knowledge of the different pattern of infections in neonates compared to older infants and children
- be able to support the neonatologist in the diagnosis and treatment of severe viral, fungal and bacterial infections of the neonate, such as herpes encephalitis or bacterial meningitis

Infections of the Immunocompromised child

- be able to recognise infectious or other presentations of specific congenital immune deficiencies and treat and liaise appropriately with the immunologist
- be able to recognise infectious or other presentations of acquired immune deficiencies whether due to HIV, nosocomial interventions, or other problems
- have an in-depth knowledge of the presentation and management of opportunistic infections in the immunocompromised host
- be able to treat central line infections in immunocompromised hosts

Infections in the Returning Travellers

- be able to manage fever in a child recently arrived from abroad, with knowledge of the possible infections in the country of origin
- be able to diagnose and treat the different presentations of the commoner tropical infections such as malaria, dengue, typhoid, tuberculosis, or HIV
- know where to seek advice on management of rarer tropical diseases
- understand the significance of malnutrition, parasitic infections and psychological stress in children from war zones, or in families seeking asylum

Unclassified Diseases and Inflammatory Diseases

- be able to diagnose, investigate and treat Kawasaki's disease
- be able to manage complex cases of Kawasaki's Disease which do not respond to first line treatment
- be able to liaise with the cardiologist for the best management of these cases
- be able to recognise and manage rare cases of Vasculitis or other inflammatory disorders and liaise with the rheumatologist for their best management
- be able to diagnose, investigate and treat within a multi-disciplinary setting children with chronic fatigue syndrome

Infection control

- understand the principles of infection control within and without the hospital environment

- have experience of working with the infection control team to limit the spread of infection in hospitals
- be actively involved in the development of hospital antibiotic policies in relation to the management of children in hospital
- know how to handle bio-hazardous specimens, and be able to advise others of the problems associated with such specimens
- be able to advise about incubation periods, periods of infectivity, and periods of school/ nursery exclusion for childhood exanthems
- know about infection control in the community and how to liaise with the public health team including the management of outbreaks, statutory notification of diseases, disease surveillance and contact tracing
- know about contact tracing for infectious diseases, in particular for conditions such as tuberculosis
- know how to deal with highly contagious infections, such as the haemorrhagic fevers
- know where to seek expert advice for the management of these rare infections

Prevention of infection

- know when to report infections which have implications for public health, whether vaccine preventable, tropical or highly infectious
- know in depth the UK national vaccination schedule, its continued development and its differences from other nations
- know when passive vaccination may be appropriately given, such as for prophylaxis of hepatitis or diphtheria
- understand the global importance of vaccine programmes
- be able to give health information for travel overseas as well as about vaccination for overseas travel
- know about manipulation of the environment to reduce infection risk, such as the use of impregnated bed nets for prevention of malaria
- know about when to use post-exposure antimicrobial prophylaxis

Paediatric HIV medicine

Competences specific to trainees who wish to specialise in HIV:

- have extensive experience in a Paediatric HIV specialist centre, including ward-based experience of inpatient care, outpatient management of children and adolescents with HIV
- understand the classification of HIV disease in children, the modes of presentation of HIV and the management of opportunistic infections
- have in-depth knowledge of the antiretroviral treatment of HIV in children
- have in-depth knowledge of the development of resistance to antiretroviral drugs, the short and long-term side effects of these drugs, and particular problems of administering these drugs to children
- have experience of multi-disciplinary care meetings for families with HIV
- have experience of recruiting children to HIV treatment trials, usually under the auspices of PENTA (Paediatric European Network for the Treatment of AIDS)
- have experience of working with adolescents with HIV, and be able to recognise the complex issues surrounding their care
- to report children to the UK National study of HIV in Pregnancy and Childhood (NSHPC) and the Collaborative HIV Paediatric Study (CHIPS)
- have experience of attendance and giving presentations at meetings of British HIV Association (BHIVA) and Children's HIV Association (CHIVA)
- have in-depth knowledge of the appropriate interventions to reduce mother to child transmission of HIV
- have experience of the multi-disciplinary perinatal management of mothers and infants to reduce transmission of HIV

Section 5

Practical Procedures and Investigations

By the end of Level 3 Training, trainees will:

- know the appropriate indications for practical procedures and investigations
- know the contraindications and complications of procedures
- know the local and national guidelines for obtaining informed consent
- know the local and national guidelines for undertaking investigations or procedures
- know the local guidelines for providing sedation and pain relief for practical procedures
- know the relevant anatomical markers for invasive procedures
- know and practise scrupulous aseptic techniques
- be aware of safety issues for patients and staff in relation to investigations of body fluids and radiation
- understand the importance of post-mortem investigations
- know the national and local guidance for obtaining consent for post-mortem
- be able to interpret results of investigations requested and respond appropriately
- be able to record results and document procedures legibly and accurately
- be able to give appropriate medical information when requesting investigations
- know that results should be requested clearly and retrieved promptly
- understand common age-appropriate normal ranges or appearances
- be able to use all equipment required to undertake common procedures and investigations
- be able to explain the investigation results to parents and/or the child
- be aware of the factors that are likely to influence the anxiety of the child, parent and doctor and know how to enlist effectively the help of play-leaders, nursing staff and more senior paediatric staff when necessary
- be receptive to feedback from patients and parents/carers on the effects of medication/treatment

- know about the role of complex investigations eg CT and MRI scans and their diagnostic potential and complications
- recognise when the results of commonly-used radiological investigations are abnormal
- have developed confidence in independent performance of practical procedures
- be able to supervise and teach others
- recognise complications of procedures and be able to respond appropriately
- understand and follow the local guidelines for the prevention and management of needle-stick injury
- be able to recognise the importance of universal precautions as well as the disposal of sharps within the department
- have experience of speaking to parents when complications have occurred
- know about processes for critical incident reporting
- obtain informed consent appropriately
- supervise handover of results that still need to be obtained at the end of shifts

Competences specific to speciality

By the end of Level 3 Training, for those training in Immunology and Infectious Diseases and Allergy, trainees will:

- know about and have experience of caring for patients with central venous access devices
- have experience of working in clinical microbiology, virology and immunology laboratories so as to understand the range and limitations of diagnostic tests available
- understand the principles of quality control in laboratory testing
- know how to obtain and handle appropriately the necessary diverse clinical specimens for diagnosis of infections
- know how to obtain and handle appropriately the necessary diverse clinical specimens for diagnosis of infections
- understand immune function testing and be able to interpret the results including specific antibody assays, complement, phagocytic cell, T cell tests

- understand the molecular genetic tests available for diagnosis basis of primary immunodeficiency disorders
- be able to interpret relevant ancillary tests such as Chest CT scan, lung function tests

Diagnostic Procedures

By the end of Level 3 Training, trainees will be able to perform the following diagnostic procedures independently:

- collection of blood from central lines
- umbilical artery and venous cannulation and sampling
- peripheral arterial cannulation
- venesection
- capillary blood sampling
- suprapubic aspiration of urine
- urethral catheterisation
- routine testing of urine
- perform basic lung function tests
- electrocardiogram
- lumbar puncture
- non-invasive blood pressure measurement

Therapeutic Procedures

By the end of Level 3 Training, trainees will be able to perform the following therapeutic procedures independently:

- administer intradermal, subcutaneous, intramuscular, intravenous injections
- percutaneous long-line insertion
- bag, valve and mask ventilation
- needle thoracocentesis for pleural effusion or pneumothorax
- tracheal intubation
- intubation of newborn infants of most gestations
- administration of surfactant
- external chest compression

- insertion of intraosseous needle

Competences specific to speciality

By the end of Level 3 Training, for those training in Immunology and Infectious Diseases and Allergy, trainees will:

- be able to administer intradermal injections, for example, for Mantoux testing or BCG vaccination

Pharmacology and Therapeutics

By the end of Level 3 Training, trainees will:

- know and understand the pharmacological basis for treatments
- know the approved indications and justification for prescribing drugs in common paediatric problems
- know the pharmacokinetics and pharmacodynamics of commonly prescribed drugs
- be able to calculate drugs accurately according to specific dose for weight, or age/weight range or on a specific dose/surface area basis
- know the risks of prescribing in the child-bearing years, in pregnancy and in breast-feeding mothers
- know about the roles of the regulatory agencies involved in drug use, monitoring and licensing (for example the National Institute of Clinical Excellence, the Committee on Safety of Medicines, the Medicines and Healthcare products Regulatory Agency and Hospital Formulary Committees)
- be able to find out information necessary for safe prescribing through use of paediatric formularies and pharmacy liaison
- know about drug interactions of commonly used drugs
- know about procedures for obtaining consent in children and young people for the administration of drugs
- be able to use the local and national guidelines for the relief of pain in children
- know and follow local policies for intrathecal cytotoxic therapy

- respond appropriately to errors of prescription or administration and be able to talk to parents about this
- be able to prescribe safely and supervise prescription for the newborn, and for children of all ages
- know about the licensing of medicines for paediatric patients and unlicensed and off-label use and the implications of extemporaneous products
- know how to explain relevant potential adverse side-effects
- be able to advise and supervise safe prescription of intravenous fluids to medical and surgical patients
- be able to prescribe in a manner that enhances adherence and provide information and explanation that enhances concordance

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6. *Liberating Learning: a practical guide for learners and teachers to postgraduate medical education and the European Working Time Directive*, London: COPMED (2002)