A Framework of Competences for Level 3 Training in Paediatric Intensive Care Medicine

July 2006

Royal College of Paediatrics and Child Health
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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 Paediatric Intensive Care Medicine, 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 10) 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
Acquires fundamental knowledge base	*Applies knowledge base to provide appropriate clinical care*	*Evaluates knowledge and modifies clinical care pathways to enhance patient care.*
Acquires clinical examination and assessment skills and applies these in clinical practice	*Analyses clinical findings to derive appropriate differential diagnosis and management plans.*	*Evaluates assessment findings; refines and modifies management plans.*
Acquires all basic technical skills and basic life support	*Proficient at all basic technical procedures, some complex procedures and provides advanced life support.*	*May relinquish some skills in these areas dependent on area of clinical practice. May acquire specialty specific skills.*
Performs allocated tasks and begins to plan tasks	*Plans and prioritises tasks appropriately.*	*Increasing expertise with evaluation of priorities and appropriate delegation across a wide range of professionals.*
Performs allotted teaching tasks	*Plans and delivers teaching to trainees and other professionals. Develops peer mentoring skills.*	*Plans and modifies curricula. Performs assessment and appraisal. Able to provide mentorship.*
Aware of management issues	*Develops management skills and able to take responsibility for a defined project. Contributes to Committees.*	*Can negotiate and deal with conflict. Can contribute to and lead committees. Evaluates and modifies management structures.*
Performs allocated audit projects and understands the audit cycle	*Designs audit project and understands risk management. Able to write appropriate clinical guidelines. Understands the Clinical Governance implications*	*Facilitates audit, and evaluates results. Evaluates guidelines and ensures implementation of appropriate changes*
Understands the principles of critical appraisal and research methodology	*Able to appraise the literature critically and apply to clinical practice*	*Able to evaluate critical appraisal performed by others. Able to lead research projects and support others in research.*
Works in multi-professional teams	*Able to take the lead and accept leadership from other members of the multi-disciplinary team*	*Evaluates and modifies multi-professional team-working*

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 the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- know the factors which predispose to PICU admission
- know the natural history of the major causes of critical illness in childhood and prognostic indicators
- understand how clinical signs and investigations can be interpreted in terms of deranged physiology
- understand the importance of early recognition of these changes and early intervention
- understand the structure of the paediatric critical care service in the UK, the rationale for centralisation and consequent evolution of retrieval services and managed clinical networks
- understand the level of facilities and expertise available in the referring hospitals
- recognise the fluctuant nature of the demand for PICU admission and how units plan for this
- know about severity of illness scores, how they are developed and used
- know the complications of critical illness and methods used to minimise these
- know about the long term sequelae of critical illness and ICU admission

(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 the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- be able to identify the patient at risk of critical illness including cardiopulmonary arrest
- be able to synthesise the information provided by the referring clinician to form a working diagnosis
- have developed strategies to confirm comprehension and agreement by referring clinicians
- be able to offer clear, prioritised and realistic advice on the management of the critically ill child
- be able to perform competently life-sustaining procedures related to airway control and vascular access
- recognise the need to accelerate the level of support of the critically ill child and institute the necessary interventions
- be able to question and re-evaluate when a child's condition fails to evolve or respond as predicted
- remain calm but decisive in the emergency situation

(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 the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- be able to function with both confidence and diplomacy outside the comfort of the PICU environment, for example in A and E, referring hospitals or non-ICU wards

- recognise and respond appropriately to the anxiety that critical illness in a child can provoke in clinicians and nursing staff who are not exposed to this on a daily basis
- be able to collaborate effectively with specialist clinicians and other members of the multidisciplinary team, maintaining a view of the child as a whole
- recognise the impact of separation between child and parents during criticalillness
- be aware of the stresses placed on patient and family by admission to PICU
- be aware of differences in cultural and religious beliefs regarding end-of-life decisions and how these influence the priorities of the family after the death of a child

(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

Competences specific to the specialty:

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the need for accurate data collection to allow continuous audit and quality control in PICM
- be able to develop and implement guidelines for use throughout the managed clinical network
- appreciate the need to carry out research in the sickest patients to facilitate improvement in care, but also the problems involved in performing these studies, for example obtaining informed consent in the emergency situation
- take part in outreach education to referring hospitals

(*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 in Paediatric Intensive Care Medicine, trainees will:

- be able to assess the needs of an individual patient, taking into account local resources, and how these may be met by the PICU network
- be able to triage and prioritise patients
- be able to work effectively with the senior nursing team to manage resources and balance the needs of planned and emergency admissions
- be vigilant to any potential hazards to the multidisciplinary team in or out ofthe PICU and take steps to minimise these risks
- recognise when the limits of improvement have been reached with medical management and the patient requires urgent intervention, perhaps elsewhere, for example, emergency atrial septostomy
- be able to plan safe and timely discharge from the PICU

(*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 in Paediatric Intensive Care Medicine, trainees will:

- maintain a log of retrievals and procedures carried out, including any adverse events or complications

(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

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

[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

- 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

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the impact of stress on the ability of parents to digest and comprehend information about their child and the need for repetition and clarification
- be able to talk through the issues with families in the most difficult circumstances, showing empathy and compassion
- recognise the value of constructive feedback to and from referring clinicians
- ensure detailed discharge plans are explained to referring clinicians including outstanding issues that have not been addressed on the PICU

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

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

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- involve the family and appropriate members of the multidisciplinary team early to develop strategies to meet the challenges posed by this group of children when admitted to the PICU, for example, anxiety reduction strategies, tailored sedation

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 in Paediatric Intensive Care Medicine, trainees will:

- understand the importance of adequate nutrition and how nutritional needs may be altered in critical illness
- know how energy expenditure may be measured in the ventilated patient, for example, the use of Deltatrac
- understand that specific nutritional deficits can complicate critical illness
- understand how obesity may complicate the management of critical illness and take account of this when planning care

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 in Paediatric Intensive Care Medicine, trainees will:

- be aware of the possibility of pregnancy in the critically ill adolescent

Section 4 Specialty-specific Competences in Paediatric Intensive Care Medicine

This section sets out the competences trainees should acquire in the specialist areas of Paediatrics. They appear in alphabetical order and are grouped in lists and tables. The competences in lists at the beginning of each section apply to all conditions in that specialism. The tables offer detailed reference where specific skills or knowledge may be linked to specific conditions rather than to overall practice in this area.

Anaesthesia, Airway Management and Resuscitation

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the benefits and potential risks of controlled ventilation in the serious ill or injured child
- have a working knowledge of the pharmacology of commonly used anaesthetic agents, sedatives, analgesics and muscle relaxants, the indications for their use and their side effect profiles
- understand the principles of inhalational anaesthesia
- know the Anaesthesia Association of Great Britain and Ireland minimum standards of monitoring and adhere to them in practice
- understand how the monitoring works
- know the principles of regional anaesthesia
- be able to manage a child with a regional block in place
- recognise the child who requires airway intervention and ventilation and be able to advise or intervene accordingly
- know the indications for a rapid sequence induction for intubation
- be able to manage the airway expertly, using appropriate equipment prior to intubation
- be able to check an anaesthetic machine and adjunct equipment
- be able to monitor a child for level of anaesthesia and degree of muscle relaxation
- be able to safely employ sedation for procedures where the child is stable and cooperative enough to facilitate this
- work within the bounds of their experience and training and recognise when expert assistance is required

The conduct of anaesthesia for intubation of a child	Knowledge and understanding	Skills
Stable patient requiring non emergency invasive procedure, for example vascath for semi-urgent CVVH	**understand the need for an empty stomach** **know the patient factors which increase risk of anaesthesia**	**be able to assess child for appropriateness of general anaesthesia on PICU** **be able to explain a procedure and take consent for general anaesthesia** **be able to employ appropriate anaesthetic and airway techniques including LMA according to patient and procedure** **be able to supervise post-anaesthetic monitoring and assess fitness for discharge to ward** **be able to prescribe post-procedure analgesia and monitoring on ward**
Patient requiring emergency procedure	**understand the principles involved in anaesthetising the high-risk patient** **understand the principles and indications for a rapid sequence induction**	**be able to quantify specific risks involved** **be able to seek appropriate support** **be able to plan anaesthesia and post-procedure care according to procedure and patient factors** **be able to perform a rapid sequence induction where appropriate** **be able to inform the operator of changes in the patient's condition which require interruption of**

		intervention
In shock	**understand the outcome benefits of early organ support in the child with septic shock** **understand the cardiovascular effects of anaesthetic agents**	**recognise the child with cardiovascular compromise and tailor anaesthetic accordingly**
With cardiac pathology	**understand the benefits of assisted ventilation in myocardial dysfunction** **understand the specific anaesthetic risks for specific cardiac pathology**	**be able to identify situations where they will need expert help** **be able to perform anaesthesia for DC cardioversion**
With serious head injury	**understand need for low threshold for intubation in child with serious head injury requiring transport** **understand factors which increase risk of secondary injury** **know which anaesthetic agents increase intracranial pressure (ICP)**	**be able to plan anaesthesia to minimise these risks** **be able to monitor child for clinical signs of seizures, rising ICP and/or under-sedation** **be able to attempt tight control of ventilatory, cardiovascular, metabolic parameters for neuroprotection during anaesthesia**
With respiratory failure	**understand particular difficulties which may occur in severe acute asthma** **know which anaesthetic may be useful in alleviating bronchospasm**	**be able to anticipate cardiovascular compromise** **recognise the need to avoid drugs which precipitate bronchospasm**
With upper airway obstruction including tracheal compression	**understand the use of inhalational anaesthesia in this setting** **understand the need for caution with muscle relaxants** **understand the potential**	**be able to assess a patient for airway obstruction and determine the level** **be able to plan for difficult intubation** **be able to call expert help**

	for deterioration on induction	**recognise when airway is inadequate for transfer**
The difficult airway	**be familiar with assessment of the airway including the use of specific tests** **understand the issues surrounding ventilation via needle cricothyroidotomy**	**be able to assess a patient for ease of mask ventilation, laryngoscopy and tracheal intubation** **be able to institute a 2-plan approach to managing a potentially difficult airway** **have a structured approach to airway management** **be able to plan for the failed intubation** **be able to manage the unanticipated difficult airway safely until help arrives** **be able to perform needle cricothyriodotomy**
Resuscitation	**know the algorithms for management of cardiac arrest** **understand and be able to identify the reversible causes of cardiac arrest** **understand the problems surrounding the patient post-successful resuscitation**	**be able to perform CPR** **be able to lead a team in CPR** **be able to distinguish the various pre-arrest and cardiac arrest rhythms and manage them accordingly** **be able to treat reversible causes of cardiac arrest** **be able to make an informed decision to stop resuscitation** **be able to manage a patient following successful resuscitation**

Cardiology

Continuing development from the Level 1 document

- have the knowledge and skills to be able to assess and initiate management of babies and children presenting with cardiological disorders
- know the genetic and environmental factors in the aetiology of congenital heart disease
- be able to formulate a differential diagnosis
- be able to select and interpret appropriate cardiological investigations and know the indications for echocardiography
- understand the life-threatening nature of some of these conditions and when to call for help
- know the possible cardiac complications of other system disorders
- know when referral for specialist paediatric cardiology assessment for further management is appropriate

Change of wording from the Level 1 document

- be able to provide advanced life support and lead the team at a (*respond appropriately to*) cardiac arrest

Substantial re-wording or new statements of competence for Level 2 Training

- be able to identify ECG abnormalities
- be able to contribute to the local provision of long-term care working with specialty services and networks of cardiac services
- be able to lead long-term management of the child's overall health and developmental needs working effectively with the family and other professionals involved

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- have a working knowledge of the anatomy, physiology and natural history of the majority of complex congenital cardiac conditions
- be familiar with the surgical procedures required for the majority of conditions and their possible post-operative complications

- know that CHD may be associated with other system abnormalities and investigate and manage as appropriately
- be able to liaise effectively with the paediatric cardiologist to offer appropriate advice to referring clinicians
- be able to use all available clinical information to assess the degree of cardiovascular compromise of a patient being mindful of the possible limitations of this assessment
- be able to recognise the sick neonate with a potential duct dependent lesion
- recognise the particular risks associated with anaesthetising the child with cardiac disease and take steps to minimise these
- be able to manage a child requiring urgent cardiology intervention
- know the principles of ECMO and other forms of mechanical cardiovascular support, the indications for use, complications and factors which affect outcome
- know the principles of cardiac transplant, the indications for referral to a transplant centre and factors which affect outcome

Acute presentations

The patient presents with:	**Knowledge and understanding**	**Skills**
Cyanosis	know the normal fetal circulation and transitional changes after birth know the anatomy of the common causes of cyanotic heart disease **know the proper conduct and interpretation of a hyperoxia test** **know the indications for Prostin infusion, dose range and side-effects**	be able to differentiate between cardiac and non-cardiac causes of cyanosis be able to initiate emergency management **and lead continuing care until appropriate transfer of care occurs** be able to describe clinical signs and investigations accurately and effectively with a cardiologist recognise when treatment is urgent **be able to generate a most likely diagnosis from history,**

		examination and basic investigations **be able to initiate ventilation and inotropic support in a sick neonate with possible CHD and adjust therapy in respect to diagnosis**
Heart Failure, including cardiac conditions which present with shock	understand the causes of heart failure **have some knowledge of the natural history of the conditions involved** **understand the clinical features which suggest acute myocarditis** **understand that children with heart failure are less able to cope with stress and increased metabolic demands** **understand the potentially deleterious effects of anaesthetic and sedatives agents in this setting** **understand how cardiac function may be monitored**	**be able to initiate appropriate investigations and treatment** **be able to use inotropes, vasodilators and ventilation appropriately to support the failing heart** **recognise the child who may benefit from mechanical cardiovascular support** **liaise with cardiology about specific treatments**
Arrhythmia	know the causes of arrythmias **know the clinical and ECG features which distinguish these arrhythmias** **know the dose ranges and side-effects of commonly used anti-arrhythmias** **know the principles of transvenous and oesophageal pacing**	be able to recognise common dysrythmias on ECG be able to initiate emergency treatment in arrhythmias such as paroxysmal superventricular tachycardia **be able to assess the patient clinically for level of compromise** **be able to perform emergency cardioversion (electrical and**

		pharmacological) **be able to institute external pacing as a temporary measure in heart block**
Infective Endocarditis	know when prophylaxis against endocarditis is indicated know the causes of endocarditis	be able to advise parents about prophylaxis against endocarditis be able to recognise the possibility of endocarditis be able to initiate appropriate investigations and treatment
Collapse with known congenital heart disease	**understand the child's individual anatomy and physiology** **understand the vulnerability of these children to relatively minor insults** **know the most likely causes of collapse given the cardiac diagnosis**	advise referral clinicians about general methods of support instigate appropriate emergency interventions based on differential diagnosis
The post-operative cardiac patient	**understand non-cardiac factors which may complicate recovery** **understand the principles and effects of cardiac bypass/ hypothermia/circulatory arrest** **know the more common post-operative problems, predisposing factors and how they vary in incidence with type of operation performed** **understand the risk factors for excessive post-operative bleeding** **have a knowledge of how the coagulation pathway is altered after bypass surgery** **have a knowledge of the methods used to assess the clotting profile**	identify post-operative complications early be able to manage post-operative complications and emergencies be able to evaluate the post-operative coagulation profile and manage appropriately be able to explain clearly to parents the events surrounding the procedure, any complications

	including use of the Thromboelastogram **understand the action and use of various blood products and drugs used to control bleeding** **understand the importance of sinus rhythm in the post-operative cardiac patient** **understand the principles of temporary pacing and different modes used** **understand the significance of changes in monitored biochemical, haematological and physiological parameters**	

Child Protection and children in special circumstances (Social Paediatrics)

Continuing development from the Level 1 document

- understand concepts and factors underpinning child protection work
- recognise where families are distressed and need help to prevent child abuse
- understand the emotional impact of abuse on the child, family and on professionals
- keep accurate records of all findings and communications with the child, family members, and all other professionals
- be able to record clearly the results of an examination of a baby, child or adolescent using body charts
- recognise the importance of noting all observations of the child's demeanour and interactions with parents or carers
- understand the need to initiate a safe response where abuse is suspected, while treating the family with respect and courtesy at all times
- understand the ways in which their own beliefs, experience and attitudes might influence professional involvement in child protection work

- understand the effects of family composition, socio-economic factors and poverty on child health
- have an understanding of how the different disciplines and agencies collaborate locally with respect to looked-after children, children with disabilities and over child protection issues
- know about the resources that may be available from health and other agencies, including the voluntary sector, to support families in need
- be aware of child health exploitation issues including child prostitution, child labour and children in combat
- be aware of the effects of armed conflict on child health
- be aware of the millennium development goals
- be aware of the implications of sustainable development in low income countries

Change of wording from the Level 1 document

- be familiar with the different categories of abuse and recognise that they may occur together: physical, emotional, sexual, neglect, fabrication or falsification/induction of illness in a child
- recognise features in the presentation where child protection may be an issue, for example where there are patterns of injury, delay in presentation, inconsistencies in the history and know how to act on them
- be able to recognise and assess increased needs in children who are fostered, adopted or in residential care
- be able to assess and initiate (*recognise and outline*) the management of the child in need of protection
- know the local guidelines and national guidance and follow the procedures for cases where child abuse is suspected

- know how to access the Child Protection register and understand its role and its limitations
- be familiar with legal processes, legislation, the role of the family court, guidelines and recommendations, such as those in the Laming Report (2003) relating to child protection and children in need

- know how to access (*have some familiarity with the roles of*) and understand the roles of allied health professionals and other agencies in the support of children and families
- understand the work of *(be aware of)* the World Health Organisation and UNICEF

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

- have attended a training course in child protection
- be alert to the diversity of physical signs and symptoms that might indicate child abuse
- be able to conduct an assessment for physical abuse, recording findings and come to a conclusion about the nature of injuries under supervision
- know what to do if a child discloses allegations of abuse
- know where help with management can be obtained and understand the pathways to ensure follow-up
- understand the role of named and designated professionals
- understand the difference between civil and criminal proceedings
- understand the difference between a medical report and a witness statement for the police and be able to produce either
- be able to compile and write, under supervision, the range of reports required in Child Protection work including police statements, medical reports for social services and court reports
- be able to contribute to case conferences, strategy meetings or court hearings under supervision
- be able to appear as a professional witness in civil or criminal proceedings
- be able to undertake and document a comprehensive medical assessment of a child looked after by the local authority
- be aware of the role of the Medical Adviser on adoption, of the local adoption panel and know how adoption medical reports are compiled

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand that non-accidental injury is one of a number of possible causes of an apparent life-threatening event
- understand that certain symptoms and signs consistent with non-accidental injury may also be found in critically ill children from other causes
- be aware of the current literature regarding this issue and how knowledge of the mechanisms involved in causing unexplained brain injury in infants is still in evolution
- understand the importance of establishing a diagnosis in the child presenting with an apparent life-threatening event and instigate appropriate investigations

Acute presentations

The child presents with:	**Knowledge and understanding**	**Skills**
The child presents with physical injury	know how to assess in relation to history, developmental stage and ability know appropriate investigations when child abuse is a possibility, for example, skeletal survey when appropriate **be aware of the current evidence on interpreting injuries such as bruising**	be able to initiate appropriate investigations be able to recognise new and old fractures on an X ray be able to initiate a multi-disciplinary investigation in consultation with a more experienced colleague
Head injury	know about acute and chronic presentations of subdural haemorrhage know that this may cause symptoms mistaken as having a metabolic or infective cause in an infant know the appropriate investigations and involvement of other	be able to perform fundoscopy and recognise retinal haemorrhage be able to initiate emergency management and urgent investigations be able to co-operate in multi-disciplinary and multi-agency working

	disciplines, for example ophthalmology, radiology know that retinal haemorrhages may be difficult to detect and when an ophthalmologist should be involved	
Vaginal or rectal bleeding	know that sexual abuse forms part of the differential diagnosis know when an expert genital examination is needed and the role of colposcopy as part of that know about the risk of acquired sexually transmitted infections	be able to refer to a colleague experienced in examination for sexual abuse
Self-harm	recognise this as an expression of distress, acute or long-term recognise repeated self-harm as indicating serious emotional distress	be able to refer to the CAMHS team
Apnoeic episodes as an infant	be aware of this as a possible presentation of imposed airway obstruction and know the indicators that this may be the case understand the life-threatening nature of imposed airway obstruction	be able to discuss this with parents
The child presents with an out of hospital arrest or apparent life-threatening event	**understand the differential diagnosis** **understand the importance of gathering as much clinical information as possible pre-mortem** **understand the factors which affect prognosis and be aware of the**	**be able to instigate investigations as soon as possible, storing samples appropriately out of hours if necessary** **be able to refer a death to the coroner**

	current literature on "out of hospital arrest" **understand a death without cause must be referred to the coroner**	

Diabetes and Endocrinology

Continuing development from the Level 1 document

- be able to measure children accurately and to assess their growth using appropriate growth charts and taking into account parental stature and pubertal status
- be able to assess accurately pubertal stages of development
- know about changes to insulin and steroid therapy in children with diabetes and hypoadrenalism during acute illness or perioperatively
- understand the endocrine complications of other diseases

Substantial re-wording or new statements of competence for Level 2 Training

- have the knowledge and skills to be able to assess and initiate management of patients presenting with diabetes, growth or endocrine presentations in inpatient and outpatient settings and provide continuing care in association with specialists or as part of networks as appropriate

Competences specific to the specialty

By the end ofLevel 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the impact of critical illness on normal endocrine function and the potential for clinically important effects
- be able to manage children with known endocrine abnormalities admitted to the ICU with an acute exacerbation or for another condition or surgery

Acute presentations

The patient presents with:	**Knowledge and understanding**	**Skills**
A child presents 'well' with diabetes mellitus	know the pathophysiology of diabetes mellitus recognise the early features of this presentation know the principles of diabetes management including commonly used insulin regimens know about the long term complications of diabetes and about ways to reduce the risks of these occurring	be able to explain this condition to parents **and initiate treatment** be able to liaise with the children's diabetes team be able to give basic advice about diet and exercise
Diabetic ketoacidosis	understand the pathophysiology of diabetic ketoacidosis know how to treat and monitor progress **know the incidence and associated risk factors for developing cerebral oedema** **understand the importance of formal and frequent neurological assessment** **understand that shock may be due to associated sepsis**	be able to recognise the clinical features of this condition recognise potential complications including cerebral oedema be able to lead the team when initiating resuscitation and early treatment be able to manage ongoing treatment safely within guidelines **be able to calculate osmolality, corrected sodium and anion gap to monitor fluid and insulin therapy** **be able to initiate therapy for suspected cerebral oedema including the use of osmotherapy** **be able to intubate and ventilate safely**
Hypoglycaemia	know the causes, complications and treatment in the neonatal period and beyond	be able to take relevant investigations required for the confirmation of cause

	know that blood glucose is an urgent investigation in patients with impaired conscious level be aware of the clinical features which would suggest hypopituitarism or adrenal insufficiency know when to consider rare causes of hypoglycaemia and what investigations to perform during the hypoglycaemic episode **understand that the most common cause of hypoglycaemia on the PICU is lack of substrate** **understand that rebound hypoglycaemia may occur after bolus dextrose**	be able to assess whether any change to insulin treatment is needed to prevent recurrence in diabetic patients be able to treat hypoglycaemia safely and effectively with intravenous glucose or glucagon where appropriate recognise the need to inform the diabetes team of serious hypoglycaemia in their patients **be able to quantify the child's glucose requirement to identify the child with true increased requirement and investigate appropriately**
Neonatal thyrotoxicosis	know the cause of this condition and its natural history	recognise this presentation and the need for urgent treatment **recognise thyroid dysfunction as an unusual cause of presentation at any age**
Ambiguous genitalia	be aware of the causes of this presentation understand the features of congenital adrenal hyperplasia and its early management	recognise the extreme sensitivity of this presentation and of the need to seek urgent help from specialist colleagues with regard to management and counselling parents be able to give appropriate information to parents

Gastroenterology and Hepatology

- have the knowledge and skills to be able to assess and initiate management of patients presenting with common gastroenterological problems in acute and outpatient settings
- be able to lead or contribute to local care in association with specialists or as part of a network as appropriate

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the effect of cardiovascular collapse on hepatic function
- understand the systemic effects of liver failure
- understand the pharmacokinetic and pharmacodynamic changes which occur in liver failure

Acute presentations

The patient presents with:	**Knowledge and understanding**	**Skills**
Acute abdominal pain	know the causes of acute abdominal pain	recognise when to request a surgical opinion recognise conditions which require urgent intervention eg intussusception recognise the need to consider acute appendicitis in very young children recognise signs of pain in an infant or small child **recognise that an acute abdomen may go unrecognised in a child with neurological disease or learning difficulties and the potential complications of a jejunostomy**

		recognise the need for urgent intervention before transfer
Acute diarrhoea and/or vomiting	know the causes of the symptoms of acute diarrhoea and vomiting understand the scientific principles for oral and intravenous fluid therapy **know that acute gastrointestinal symptoms may be the manifestation of serious pathology elsewhere**	recognise features in the presentation which suggest serious pathology, for example haemolytic uraemic syndrome, appendicitis, intestinal obstruction implement local isolation policies
Jaundice	know the causes of neonatal and childhood jaundice	investigate appropriately and know when to refer to specialist services
Upper and lower gastrointestinal bleeding	know the causes of upper and lower gastrointestinal bleeding understand the potentially life-threatening nature of this presentation **understand a large intestinal bleed may precipitate encephalopathy in a child with liver disease** **know the principles of use of the Sengstaken tube**	recognise features in the presentation which suggest serious pathology be able to assess the severity of the condition institute appropriate emergency treatment **and lead continuing care until appropriate transfer occurs** **be able to intubate the child with severe haematemesis and recognise the need for rapid sequence intubation** **be able to gain urgent vascular access** **be able to initiate therapies to reduce bleeding and to empty the gut**
Abdominal distension	know the causes of abdominal distension	initiate investigation and seek surgical opinion when

	understand how abdominal distension impacts on pulmonary and cardiovascular function **know the principles of measurement of intra-abdominal pressure and the significance of the value obtained**	required
Acute liver failure	know the causes of acute liver failure know the management of Paracetamol poisoning **understand markers of severe liver dysfunction and their prognostic value with respect to: indications for liver transplantation** **understand the principles of liver transplantation and factors which affect outcome** **know the clinical grading of encephalopathy in liver disease** **understand that early intervention, including intubation and ventilation is important**	be able to assess the severity and complications of this condition be able to initiate appropriate resuscitation, liaise early with the paediatric liver unit and continue care until transfer occurs **be able to intubate and gain vascular access safely in the child with a coagulopathy** **be able to transfer the child with acute liver failure, liaising effectively with the specialist liver centre**
Congenital abnormalities	know the presenting features of congenital abnormalities including tracheo-oesophageal fistula, malrotation, bowel atresias, Hirschsprungs disease, abdominal wall defects, diaphragmatic hernia	institute appropriate emergency treatment, and be able to assess the fitness of the baby and the need to transfer to a specialist centre recognise when the bowel might be compromised

	be familiar with potential associated abnormalities know when antenatal transfer to a Neonatal Surgical Centre should be considered	recognise the need to liaise with surgeons and when this is urgent

Haematology and Oncology

Continuing development from the Level 1 document

- be able to initiate management in common presentations of non-malignant disorders
- know the principles of cancer treatment
- be familiar with the indications and complications of bone marrow transplantation
- know about national and local blood transfusion policies and procedures

Change of wording from the Level 1 document

- have the knowledge and skills to be able to assess and initiate investigation of patients presenting with haematological or oncological presentations in inpatient and outpatient settings
- work effectively with (*be aware of*) specialist nurses and members of palliative care teams
- know (*be aware of*) the short- and long-term side effects of chemotherapy and radiotherapy and be able to explain the common ones

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

- know about local policies for intrathecal cytotoxic therapy

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- know the reasons why patients diagnosed with oncology and haematology conditions present to the PICU
- be aware of the literature describing the changing prognosis for this cohort of patients in the PICU

- understand that occult malignancy may present in a variety of ways to the PICU
- recognise the special requirements of the oncology patient cared for on the PICU and liaise effectively with the oncologist involved
- recognise the child at risk from tumour lysis syndrome (TLS)
- know the methods used to minimise the risk of TLS and how do identify it
- be able to institute therapy urgently for TLS including renal support
- understand the risk to the airway presented by a mediastinal mass, particularly the implications for use of anaesthesia and muscle relaxation
- liaise with oncologists and anaesthetists to ensure any intervention is performed in the most appropriate setting

Acute and outpatient presentations

The patient presents with:	Knowledge and understanding	Skills
Anaemia	know and understand the causes of anaemia	be able to investigate anaemia and recognise serious underlying pathology
	understand the predisposing factors and consequences of iron deficiency anaemia	be able to manage iron deficiency anaemia
	understand the hereditary basis and clinical features of sickle cell anaemia and the thalassaemias	know how to counsel parents about hereditary anaemias
	understand the long-term implications for families	be able to explain screening for the thalassaemia or sickle cell trait
	know about the potential consequences of haemolytic anaemia	be able to manage sickle cell crisis, including safe administration of fluid and analgesia
	know the limited indications for exchange transfusion	**be able to ventilate the child with sickle chest crisis**
	know the pathophysiology and therapy of sickle chest syndrome and plastic bronchitis	**be able to perform an exchange transfusion when indicated**

		be able to recognise the need for bronchoscopy in sickle chest crisis
Polycythaemia	know the causes and treatment of polycythaemia in the new-born period understand why children with cyanotic congenital heart disease are vulnerable to polycythaemia	be able to undertake partial plasma exchange transfusion in a new-born infant
Neutropaenia	understand the significance of fever in a neutropaenic patient understand the differing risks of neutropaenia in different conditions and treatment regimens **understand the most likely source and pathogens in oncological sepsis**	be able to manage febrile neutropaenia, following local network guidelines and recognising when to liaise with specialist services **be able to elicit signs of severe neutropaenic sepsis over the phone and give appropriate advice**
Purpura and bruising	know the causes of purpura and bruising understand immune mechanisms in vasculitis and in allo- and auto-immune thrombocytopaenia	recognise features in the presentation which suggest serious pathology or child abuse be able to explain Henoch-Schonlein purpura to parents **and manage patients** **be aware of situations where specialist referral is appropriate** be able to explain idiopathic thrombocytopaenic purpura (ITP) to parents including when precautions and treatment are necessary **and manage continuing care** be able to manage acute bleeding in haemophilia and von Willibrands disease use genetic counselling services appropriately

Other haemorrhage due to coagulopathy	know the causes and presentations of haemorrhagic disease of the newborn understand the hereditary basis of haemophilia and other coagulation disorders	be able to discuss the need for prophylactic Vitamin K with parents be able to recognise and treat haemarthrosis in a patient with haemophilia and be aware of the need to treat urgently, with appropriate advice
Leukaemia	know the different types of leukaemia and their prognoses recognise and understand the clinical manifestations of leukaemia **understand that an extremely high white cell count increases the risk of TLS**	be able to recognise and initiate investigations to diagnose leukaemia **and communicate appropriately with the child and family** be able to recognise the immediate dangers of leukemia to the newly presenting child be able to follow local and national protocols in treating leukaemia and associated infections
Lymphomas	know the clinical features of Hodgkin's disease and non-Hodgkin's **lymphoma** **know the features which suggest lymphadenopathy may be malignant and how it might be investigated**	be aware of staging and protocols for treatment
Other solid tumours	know about the clinical presentation, treatment and prognosis of nephroblastoma and neuroblastoma be aware of the clinical features and investigation findings of other solid tumours	be aware of staging and protocols for treatment be able to recognise the presenting features of these tumours
Transfusion	understand the risks and benefits of administering blood products know the indications for irradiated blood products **and other specially treated blood products**	follow transfusion procedures correctly explain the risks and benefits order blood products appropriately

	recognise the concerns of some groups in society in relation to blood products	respond to objections to transfusion appropriately manage transfusion reaction
Thrombosis	**understand the risk factors for arterial and venous thrombosis particularly when associated with intravascular access** **know the indications, contraindications and complications of thrombolysis** **know the long term sequelae of thrombosis** **know about heparin induced thrombocytopaenia (HIT) and related intravascular coagulation**	**take steps to minimise the risks of developing thrombosis on the PICU** **be able to initiate investigations for procoagulability and liaise with haematologists regarding more specific investigations** **be able to diagnose and treat venous and arterial thrombosis** **be able to screen for HIT and take necessary action**

Infection, Immunology and Allergy

Continuing development from the Level 1 document

- have the knowledge and skills to be able to assess and initiate management of patients presenting with infectious disease and allergic conditions
- know and understand host defence mechanisms and their pattern of development
- know the causes of vulnerability to infection
- know and understand the classification of infectious agents
- know the mechanisms of maternal to fetal transmission of infection and the clinical manifestations of these infections and how to prevent them
- know the epidemiology, pathology and natural history of common infections of the fetus, newborn, and children in Britain and important worldwide infections e.g. TB, HIV, hepatitis B, malaria, polio
- be able to follow agreed local or national guidelines on notification of infectious diseases
- understand the mechanisms of drug resistance

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

Change of wording from the Level 1 document

- recognise indications for and be able to prescribe appropriate first line common anti-microbials
- be able to prescribe antimicrobial prophylaxis appropriately
- apply principles of infection control
- take responsibility for (*be aware of the policies for*) notifying communicable diseases

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

- be able to use the antibiotic policies and understand the development of resistant organisms
- be able to assess and institute appropriate management of infection in an immuno-compromised child

The patient presents with	Knowledge and understanding	Skills
Septic shock	understand the pathophysiology of septic shock and its complications know local and nationally agreed guidelines for the management of septic shock including meningococcal disease be aware of the differential diagnosis of septic shock **understand the most useful clinical indicators of shock** **understand the increased mortality associated with delay in recognising and treating**	be able to initiate and lead immediate management of early and advanced features of septic shock be able to lead the team when initiating resuscitation and early treatment be able to liaise effectively with anaesthetic and PICU staff and manage patient until transfer team takes over **be able to recognise the child with septic shock over the phone and give appropriate,**

	septic shock **understand how changes in cardiac output and systemic vascular resistance vary in paediatric septic shock and methods used to assess these parameters** **understand how vasoactive drugs may affect these parameters** **understand the systemic effects of hyperthermia and rhabdomyolysis** **know the causes, clinical presentation and specific therapies for TSS** **know the causes, associations and distinguishing features of necrotising fasciitis** **understand the need for urgent surgical debridement in necrotising fasciitis** **know about immune-modulatory therapies** **know about the use of haemofiltration in septic shock** **know the long term sequelae of surviving serious sepsis**	**prioritised advice** **be able to stabilise the child with septic shock** **be able to recognise TSS and / or necrotising fasciitis and instigate specific therapies** **recognise the complications of severe sepsis and make appropriate referral to other specialists**
Fever of unknown origin	know the possible causes of fever of unknown origin understand aspects of social history that are relevant to explore	recognise features in the presentation which suggest **serious or unusual pathology and be able to initiate investigations to establish cause**
Anaphylaxis	know the management of anaphylaxis guidelines **understand the airway implications of anaphylaxis**	be able to lead the team to provide advanced life support be able to liaise effectively with anaesthetic and PICU staff

		be able to advise on the future risk of anaphylaxis and facilitate an appropriate anaphylaxis management plan by liaising with community teams **intervene early in anaphylaxis** **call early for senior anaesthetic and/or ENT help with the evolving airway problem**

Metabolic medicine

Continuing development from the Level 1 document

- know the appropriate screening investigations that should be performed when a metabolic disorder is suspected
- know further investigations that should be performed in order to establish a diagnosis of a metabolic disorder
- be able to interpret commonly used investigations and understand how these differentiate between metabolic disorders including those that result in cot death
- know about the common biochemical findings in an acutely ill newborn or child presenting with metabolic disease, including hypoglycaemia, hyperammonaemia or metabolic acidosis
- understand when it is appropriate to investigate, and which investigations to perform, in a neonate or child with visceromegaly
- know the causes of metabolic bone disease and investigations to differentiate between the causes
- know when it is appropriate to consider porphyria in a child presenting with abdominal pain
- understand the principles of dietary, vitamin and pharmacological treatment of metabolic disorders
- be aware of those metabolic disorders which are vitamin responsive or responsive to pharmacological treatment

- know about the metabolic disorders which may respond to enzyme therapy or bone marrow transplantation
- know the routine neonatal screening tests for metabolic disease and be able to explain them to parents
- know the inheritance patterns of common genetically determined metabolic disorders
- know about the educational and social implications of metabolic disorders and the importance of organising support in the community for special diets and other risks

Change of wording from the Level 1 document

- recognise and be able to manage the clinical and biochemical features of electrolyte and acid base disturbances
- know the common clinical presentations and principles of management of metabolic disease including encephalopathy, neurodevelopmental regression, muscle weakness, visceromegaly and faltering growth (failure to thrive)
- be able to initiate (*know when it is appropriate to perform*) metabolic investigations in neonates and children and in urgent situations

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

- know what samples must be taken in metabolic investigations at the time of presentation and the importance of liaison with laboratories to ensure use of the appropriate container, handling and storage
- know which metabolic disorders are associated with learning difficulties and arrange timely referral for those at risk

Substantial re-wording or new statements of competence for Level 2 Training

- be able to lead / contribute to the overall care of the child, liaising with specialty services, the dietician and other services as necessary

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- have an advanced knowledge of acid base physiology and be able to interpret results in the clinical context

- be able to recognise the child with an inborn error of metabolism and initiate supportive measures whilst awaiting metabolic input and diagnosis
- know the importance of gathering pre-mortem specimens for diagnosis of metabolic disease
- be able to manage the child with a known metabolic condition admitted with an acute exacerbation of their condition to the PICU, including indications for haemofiltration

Multi-organ failure and support

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- know how organ systems interact in health and serious illness
- understand the value of early recognition and intervention in organ failure
- know the complications that may occur with intensive care
- know the methods used to minimise these risks
- understand the value of scoring systems to evaluate severity of illness
- be able to systematically examine the seriously ill child to determine the systems involved and the degree of impairment
- be able to collect appropriate data accurately to calculate severity of illness scores

System involved	Knowledge and understanding	Skills
Respiratory	**know the indications and benefits of different forms of ventilation including non-invasive methods and high frequency oscillation** **know diagnostic criteria for ventilator associated pneumonia and likely pathogens involved** **know the causes of extubation failure** **know the causes of failure to wean ventilation** **know the complications of prolonged intubation and indications for tracheostomy** **know indications for bronchoscopy and/or CT scan** **know the principles of respiratory function tests** **know principles of ECMO for respiratory failure**	**be able to initiate and manipulate appropriate forms of ventilation according to patient's pathophysiology** **be able to manage pneumothoraces, bronchopleural fistulae, chest drains** **investigate failure to extubate and wean** **be able to construct a weaning plan** **be able to manage a patient with a tracheostomy including tube change**
Cardiovascular	**know the parameters which affect oxygen delivery** **know how these parameters such as cardiac output can be measured** **understand cardiopulmonary interactions** **know how vasoactive drugs and fluid affectthe circulation** **know the principles of mechanical support**	**be able to determine cardiovascular status at the bedside** **be able to perform intra-arterial and central venous cannulation for the purpose of monitoring and access** **be able to manipulate parameters which affect oxygen delivery and assess the response to therapy**
Haematology	**know the risk factors for thrombus formation and diagnostic and therapeutic options** **understand the involvement of the coagulation cascade in the pathogenesis of systemic**	**be able to assess need for thromboembolic prophylaxis**

	inflammatory response	
Renal	**understand the benefits and risks of renal support in multi-organ failure** **know about hepatorenal syndrome** **know the potential toxicity of drugs used on PICU** **know how renal impairment affects pharmokinetics** **know the non-renal indications for haemofiltration**	**be able to prescribe medication appropriately to achieve maximal effect with minimal toxicity** **be able to initiate renal support**
Neurology	**know the causes of peripheral weakness after critical illness including critical care polyneuropthy and its associations** **know the principles of management of raised ICP** **know how the diagnosis of brain stem death is made**	**be able to assess conscious level formally** **be able to recognise and investigate the cause of peripheral weakness** **be able to monitor the patient for level of analgesia and sedation** **be able to assess brain stem function**
Nutrition and fluids	**understand the fluid requirement of the critically ill child, how this may differ from healthy children and methods used to monitor requirements** **know how energy expenditure may be measured** **understand the importance of adequate nutrition** **know the common deficiencies that occur and resulting complications** **understand the value of enteral feeding and know the complications of TPN** **understand the importance of glycaemic control**	**be able to prescribe fluid and nutritional therapy for the critically ill child appropriately**
Musculoskeletal	**understand the factors that lead to pressure wounds and methods used to**	**recognise and treat pressure wounds**

	reduce their occurrence **understand the importance of early recognition of extravasation**	**recognise and treat extravasation injury**
Immunological	**understand that the patient is at risk of nosocomial infection** **understand how antibiotic resistance arises** **understand the rationale for use of prophylactic antibiotics and the limitations** **know the investigations which may be employed when occult infection is suspected**	**be able to liaise effectively with microbiology to prescribe timely and appropriate antimicrobials**

Neonatology

Continuing development from the Level 1 document

- be able to examine the newborn baby appropriately and with sensitivity
- be able to perform an accurate assessment of the baby at birth
- know about the retinopathy of prematurity and its prevention and treatment

Change of wording from the Level 1 document

- be able to recognise and manage (*outline the management of*) common disorders
- have the knowledge and skills to be able to assess and manage (*initiate management of*) babies presenting in the neonatal period with problems (in acute, postnatal ward and outpatient settings)
- know and be able to describe (*understand*) the effects of antenatal and perinatal events on outcome
- know and be able to describe (*understand*) the pathophysiology of the effects of prematurity
- be able to initiate diagnostic tests for common disorders and to interpret and explain results to parents

- be able to perform a reliable assessment of fluid status and adjust (*initiate appropriate*) fluid management as needed
- understand the principles of parenteral nutrition and be able to prescribe safely
- be skilled in practising and be able to teach (*have experience of*) basic practical procedures

- understand the implications for families of babies with neonatal problems and begin to support them
- be able to (*begin to develop strategies to*) communicate sympathetically with parents and have experience of strategies for dealing with their distress or anger
- be able to describe (*understand*) the long-term sequelae of prematurity and (*begin to*) recognise those at risk
- be able to initiate and lead advanced (*appropriate*) resuscitation when required
- be able to prescribe (*understand the principles and risks of prescribing*) for newborn babies and breast-feeding mothers

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

- have successfully completed a neonatal life support course
- usually be able to obtain appropriate arterial and venous access
- understand the principles and importance of nutrition in the neonatal period including assessment of nutritional status, the steps needed to establish breast-feeding, and nutritional supplementation
- be able to apply clinical reasoning when selecting tests and be able to understand the results sufficiently well to be able to explain them to parents and members of the multi-disciplinary team
- be able to decide on appropriate referrals for transfer to other units, communicate effectively with all involved and maintain care as safely as possible until transfer team takes over (*know when and how babies are transferred for specialist levels of intensive care*)
- know how to interpret radiological investigations including the basic features of cranial ultrasound and discuss basic findings with parents

- know how to refer appropriately to community services before discharge and begin to participate in the follow up of those at risk
- know about follow-up programmes for those at risk
- be able to describe the ethical issues relating to neo-natal intensive care

Substantial re-wording or new statements of competence for Level 2 Training

- understand the principles of mechanical ventilation and be able to initiate and maintain ventilatory support
- recognise the life-threatening nature of some of these situations, be able to
- lead the management and recognise when additional support is needed
- know and follow legal and ethical guidelines and be able to discuss ethical issues with the family and multi-disciplinary team

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- know the principles of management of the major neonatal conditions requiring surgical intervention
- be able to liaise effectively with the surgical team

Acute presentations

The patient presents with	**Knowledge**	**Skills**
Birth depression	know the causes of possible outcomes know the statistics of the outcomes of birth depression understand the principles of resuscitation understand the physiology of resuscitation and the responses to it know the criteria necessary before perinatal asphyxia can be diagnosed understand the physiological effects of a hypoxic-ischaemic insult	be able to provide and lead basic and advanced resuscitation, including intubation be able to carry out resuscitation using bag and mask ventilation and cardiac compressions be able to intubate pre-term babies without direct supervision be able to recognise and initiate management to prevent secondary damage

	understand the long-term implications of hypoxic-ischaemic damage	
Respiratory distress (acute and chronic)	understand the common causes of respiratory distress know the relevant investigations understand the principles and complications of differing ventilation techniques know the guidelines for surfactant therapy understand the pathophysiology and management of chronic lung disease be aware of the indications for ECMO and nitric oxide therapies **understand the importance of adequate continual supply of nitric oxide once commenced and therefore the risks of transporting a patient on iNO** have seen echocardiography where patent ductus arteriosus is diagnosed understand the contribution of patent ductus arteriosus (PDA) to respiratory compromise	be able to interpret chest radiographs and act on results be able to administer surfactant be able to initiate and continue to manage respiratory support on a ventilator be able to diagnose pneumothorax and perform insertion of a chest drain when indicated recognise when response to management is not optimal and be able to provide help or request help from specialist colleagues or other services obtain, interpret and react appropriately to blood gas and blood pressure results be able to teach and supervise the insertion of umbilical and peripheral, arterial and venous lines **know the safe positions for the placement of arterial and venous lines, and be able to interpret appropriate images to confirm correct placement of umbilical and venous arterial lines** be able to identify signs suggestive of patent ductus arteriosus (PDA) and initiate management

		be able to plan the discharge of a baby on long term oxygen to the community
Cyanosis not of respiratory origin	understand the anatomy and implications of cyanotic congenital heart disease understand the pathophysiology of persistent pulmonary hypertension and know about treatment	be able to make a likely diagnosis and initiate appropriate investigations and treatment **be able to advise on management including the need for prostin** **be able to stabilise and transport the "blue baby"**
Hypotension	understand the causes and effects understand the rationale for different treatment options	be able to interpret and act on blood pressure measurements
Intra-uterine growth restriction and other nutrition problems	understand the importance of nutrition in sick babies understand the importance of breast-milk feeds understand the principles of parenteral nutrition know the causes of intrauterine and postnatal growth failure know about, risk factors for necrotising enterocolitis know about the signs, symptoms and complications of necrotising enterocolitis **understand the factors associated with the development of NEC in the non premature baby** **understand the risks associated with the use of TPN**	be able to keep and interpret accurate growth records be able to prescribe appropriate nutrition and supplements be able to insert a percutaneous long line be able to assess appropriate position of percutaneous long line from imaging be able to recognise and begin to address poor growth **be able to recognise early signs of necrotising enterocolitis and initiate treatment**
Need for fluid or blood product therapy	know the fluid requirements of pre-term, sick and growth-restricted babies know the causes of abnormal coagulation	be able to assess fluid balance be able to act to correct fluid balance abnormalities be able to prescribe blood

	know when irradiated blood products are indicated know the indications for therapy with blood products	product transfusions be able to test for and recognise bleeding disorders be able to manage treatment for bleeding disorders
Abnormal neurological status, including seizures	understand the aetiology and prognosis of abnormal neurological status know the stages of periventricular haemorrhage and leucomalacia know about the management of post-haemorrhagic hydrocephalus know the possible causes and effects of seizures know the possible causes of abnormal tone **understand the need to recognise the baby with an inborn error of metabolism and the need to perform treatment early to minimise neurological complications**	be able to perform a neurological assessment be able to recognise common abnormalities in cranial ultrasound scans have had some experience of performing cranial ultra-sound be able to make a likely diagnosis and initiate management of seizures
Serious congenital anomalies	understand the underlying pathology understand the use of antenatal diagnosis and the role of fetal medicine understand the role of fetal medicine and interventions that are available be aware of surgical interventions understand the impact on parents of the birth of a baby with serious congenital abnormalities or potential disabilities and the ensuing grief due to loss of the expected normal child	be able to recognise serious abnormalities be able to diagnose common syndromes be able to initiate appropriate tests be able to respond to parents' immediate questions be able to break bad news to parents be able to refer appropriately to parent support groups and to community services before discharge
Sepsis	understand the importance of timely treatment, know the range of treatments	anticipate early signs of sepsis and initiate appropriate

	and the likely pathogens know about nosocomial infection	anti-microbial therapy and supportive management practise effective infection control
The dying baby	understand the ethical principles involved understand the ethical principles in withdrawing or withholding care from an infant know about terminal care and bereavement counselling	be able to communicate sympathetically with parents **and staff** **be able to lead management of withdrawal or withholding care from an infant** be able to deal with personal stress and know when to look for support

Nephro-urology

Continuing development from the Level 1 document

- have the knowledge and skills to be able to assess and initiate management of patients presenting with nephro-urology problems in acute and outpatient settings
- be able to perform a reliable and accurate assessment of fluid status and initiate appropriate initial fluid management
- have the knowledge and understanding of fluid and electrolyte imbalance and blood pressure in children with kidney problems
- have an understanding of the implications for families of children with chronic kidney problems
- understand the principles of prescribing in children with renal disease

Change of wording from the Level 1 document

- understand the role of different renal imaging techniques including ultrasound, static and dynamic isotope scans in the investigation of urinary tract disorders **and recognise common abnormalities**

Substantial re-wording or new statements of competence for Level 2 Training

- be able to interpret blood bio-chemistry in relation to age and body size

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the principles in management of the post-renal transplant patient and liaise effectively with the renal team

Acute presentations

The patient presents with	**Knowledge and understanding**	**Skills**
Nephrotic syndrome	understand the complications of the nephrotic state understand the principles of the pharmacological, dietary and fluid management understand the investigations including the indication for renal biopsy	be able to advise parents on long-term management and complications of treatment assess features in the presentation which suggest serious or significant pathology **be able to assess fluid balance, circulation and risk of impaired renal perfusion**
Acute nephritis	know the aetiology, pathophysiology and immunological basis of glomerulonephritides and vasculitides understand the investigations that will differentiate between the causes know the features that are prognostically significant know the range of immunosuppressive therapies that may be used in these conditions	recognise features in the presentation which suggest serious or significant pathology
Acute renal failure	know the causes of acute renal failure understand the investigations that may differentiate between these causes	be able to assess and initiate management of life-threatening events eg hyperkalaemia

	know methods of preventing renal failure **know the features of haemolytic uraemic syndrome and understand the specific problems associated with pneumococcal HUS** **understand the methods to correct fluid and biochemical abnormalities seen in renal failure** **understand how diuretics work** know the indications for dialysis **understand the principles of various forms of renal support and when they may be employed on the ICU**	**be able to manage the underlying cause of hyperkalaemia** **be able to insert a vascath, prescribe acute renal replacement therapy and monitor its effectiveness** **be able to prescribe peritoneal dialysis**
Hypertension	know the techniques of blood pressure measurement know the causes of hypertension and the principles of treatment **understand that hypertension is an unusual cause of neurological symptoms and the importance of differentiating this situation from raised ICP and the Cushing response** **be aware of the complications which may occur if the blood pressure is reduced acutely** **know the pharmokinetics and side-effects of drugs used to treat hypertension**	be able to interpret blood pressure measurements be able to identify complications be able to initiate management and liaise with specialists effectively **be able to initiate and monitor the use of intravenous antihypertensives**
Acute scrotal pain	know the differential diagnosis of this symptom	be able to recognise the important causes of acute scrotal pain be able to identify children who require urgent surgical referral
Neonate with history of abnormal	understand the causes and management of antenatal hydronephrosis	be able to recognise when to refer to a nephrologist or urologist

antenatal ultrasound of the renal tract	know about the causes of echogenic or cystic kidneys know about the inheritance patterns of renal abnormalities detected in fetal life	be able to give basic explanation of the problem, management and prognosis to parents ante- or post-natally
Stones	know the causes of stone formation	be able to recognise presenting features be able to initiate management under supervision

Neurology and Neurodisability

Continuing development from the Level 1 document

- have knowledge and understanding of the pathophysiology of common disorders affecting the nervous system
- know and understand the common causes of disability
- understand concepts of disability and what this means for the child and family
- be able to take an accurate neurological and neuro-developmental history
- be able to examine the nervous system of a newborn baby, child and young person
- be able to perform a reliable assessment of neuro-developmental status at key stages, including the newborn period, the first year of life, nursery age, school entry and late primary education
- be able to recognise a disabled child
- have the knowledge and skills to be able to initiate management of children with neurological and neurodisabling conditions in acute settings and know when and whom to call for help
- understand the life-threatening nature of acute neurological deterioration and when to call for help
- be able to recognise, initiate diagnostic tests and outline the management of common disorders
- understand the principles and use of neuro-radiological imaging
- have a basic understanding and experience of neuro-physiological tests
- understand the principles of prescribing and monitoring therapy
- understand the implications for families of children with neurological and neurodisabling conditions

- understand the impact of developmental disorders on the life of child and family at different developmental stages
- be able to work with families and professionals in the care of disabled children
- develop a commitment to advocacy on behalf of disabled children and their families
- understand the importance of seeking the views of all children to inform decisions about their individual care and about planning services

- have worked on specific cases with multi-disciplinary teams
- have experience of a range of communication skills with disabled children, their families and other professionals
- be aware of local services and how to access them
- have experience of working with other services outside neurology and neurodisability such as child protection, education, services for looked after children and adult services
- have experience of how agencies work together to address how children with health and medical needs are managed at school

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

- be aware of the role of the Designated Medical Officer to the Local Education Authority (LEA)
- be aware of the statutory requirement to notify children who may have special educational needs to the LEA and to know how to do so
- have experience of the local Special Educational Needs (SEN) panel
- be able to write SEN medical reports on simple cases
- have experience of SEN annual reviews and transition planning
- be able to recognise and come to a likely diagnosis of common developmental disorders such as cerebral palsy, dyspraxia, ADHD, specific learning difficulties and arrange timely and appropriate specialist assessment
- know how equipment can be used to lessen the effects of disability and how to refer
- be able to write reports on medical or developmental conditions for parents and non-clinical staff in education and elsewhere that are easily understood by

the lay person, and that explain the implications of the condition and how it may impact on the child and her or his carers in non-clinical settings
- know about what benefits may be payable to the disabled child and/or carers and how they may be accessed
- know about local respite facilities and how they may be accessed

Substantial re-wording or new statements of competence for Level 2 Training

- be able to work effectively with education services
- be able to distinguish simple developmental delay from developmental disorders and be aware of the cases which require specific or multi-disciplinary input and refer appropriately
- know about and be prepared to find out about self-help and support groups for children and their families with conditions in their specialist area and be able to direct parents to appropriate groups

- recognise features of life-threatening neurological disorders including raised intracranial pressure, CNS tumours and initiate the appropriate clinical response with apposite urgency
- make appropriate use of neurodiagnostic tools e.g. neuroimaging, neurophysiology, biochemistry, tissue biopsies etc, seeking expert advice appropriately about proceeding with testing or not, including in the emergency setting, and about interpretation of results
- be able to prescribe and monitor therapy for the breadth of neurological and developmental disorders, recognising the limits of their own expertise, showing awareness of guidelines and seeking expert advice appropriately
- be able to manage straightforward cases of common neurological and developmental disorders, recognising the limits of own expertise, showing awarteness of guidelines and seeking expert advice appropriately
- be able to contribute to or lead local care, working within networks or teams when appropriate
- obtain equipment appropriately to maximise participation for individual children

Comment [KB1]: Can we delete the examples here?

- access support and help with benefits advice, support and self-help groups, respite and short breaks appropriately on behalf of individual children and their families

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the need for airway protection and controlled ventilation in the child with acute neurological deterioration
- recognise that children with chronic neurological problems are at increased risk of requiring intensive care during intercurrent illness, post-operatively and after procedures involving sedation
- understand that severe physiological derangements may be easily missed in the child with neurological disability
- be able to differentiate the chronic from the acute problem
- know what constitutes a neurosurgical emergency and understand the consequences of delay in transfer to an appropriate centre

Acute presentations

The patient presents with	**Knowledge and understanding**	**Skills**
Seizures	know the common causes of seizures in newborn babies and children **know about common epileptic syndromes** **understand the links between epilepsy and behaviour problems** **understand the place and principles of the EEG and neuro-imaging in investigation** **know about the long term implications of epilepsy, including different epilepsy syndromes and the risk of learning difficulties, accident or sudden death** **understand that a seizure is a symptom and not a diagnosis** **understand the implication of seizure type for diagnosis, prognosis and therapy** **understand the systemic complications of prolonged seizure activity** **know the indications for intubation in status epilepticus and appreciate why children with status epilepticus require PICU** **understand the risks of further episodes of status** **know the indications for referral to a paediatric neurologist**	be able to initiate treatment for acute continuing seizures be able to refer to intensive care teams appropriately and lead the care maintaining patient safety until that team takes over be able to form a differential diagnosis be able to decide initial and continuing anticonvulsant therapy in babies and children in conjunction with the local epilepsy service be able to advise parents about education and safety **work effectively with the multidisciplinary team and be able to take the lead where appropriate** **be able to recognise seizure activity in the sedated and paralysed child** **be able to differentiate a prolonged febrile seizure or apnoea following therapy from a more serious presentation to the ICU and tailor investigations and therapy accordingly**

Faints and "funny turns"	be able to formulate a differential diagnosis for faints and "funny turns" be able to initiate the investigations that may differentiate between these causes	be able to make a likely diagnosis be able to explain likely diagnoses to parents **and manage the case**
Acute focal neurological signs	understand the implications of acute focal neurological signs understand the principles of investigation **understand the significance of false localising signs** **understand the need for urgent investigation** **understand the relative value of CT versus MRI and when contrast should be employed** **know the diagnostic features and principles of treatment of acute demyelinating encephalomyelitis (ADEM)**	be able to demonstrate the signs be able to interpret the signs have experience of interpretation of CT and MRI scans **be able to give diagnoses to parents, and be able to share difficult information effectively and compassionately** **be able to manage a child requiring urgent imaging**
Ataxia, clumsiness and abnormal movement patterns	know the common possible causes of ataxia, clumsiness and abnormal movement patterns know the indications for investigations **understand the systemic effects of severe dystonia**	be able to recognise the signs recognise which urgent investigations are needed
Hypotonia, neuropathies and myopathies	know about the common causes of hypotonia, neuropathies and myopathies know about the relevant neurophysiological and metabolic investigations **know the causes of acute weakness** **understand the principles and indications for non-invasive respiratory support in chronic weakness**	be able to demonstrate, the signs be able to elicit and interpret the signs be able to form a likely differential diagnosis **be able to initiate and interpret appropriate tests, seeking expert advice as appropriate** **be able to assess for**

		respiratory fatigue and instigate support appropriately **be able to use muscle relaxants safely in children with acute and chronic weakness**
Meningism and altered consciousness	know the likely causes or pathogens of meningism and altered consciousness **know about the presentation of partially treated and tuberculous meningitis and atypical presentations in immuno-deficient states** understand the principles of treatment be aware that organic brain conditions can lead to psychotic symptoms know when it is safe to perform a lumbar puncture know the principles of establishing brain stem death **know about the long-term sequelae of meningitis and how they might be managed** **understand how the Glasgow Coma Score changes with increasing raised intracranial pressure and the particular importance of the motor score** **know the principle of maintaining adequate cerebral perfusion and the methods used to achieve this**	assess and manage early presentations of meningitis and encephalitis use a validated coma score ensure prophylactic therapy for contacts of meningitis assess and initiate management of raised intra-cranial pressure initiate therapy appropriately call for help promptly recognise the need for urgent referral to audiology specialists after bacterial meningitis **be able to advise regarding the need for intubation and ventilation particularly where the child is to be imaged** **be able to intubate and ventilate safely the child with signs of raised ICP** **be able to decide which children should be followed up to monitor their progress after meningitis**
Neural tube defects and other congenital anomalies	know about antenatal diagnosis of neural tube defects and other congenital anomalies and their prevention know about the ethical principles	be able to recognise syndromes be able to recognise the signs and symptoms of acute and

	involved in management decisions **understand the multi-disciplinary management needed in this condition, including orthopaedic, urinary and bowel management, learning difficulties and the social implications of these conditions**	chronic blocked shunts **and manage or refer as necessary** be able to communicate sympathetically with parents
Trauma to central and peripheral nervous systems	be aware of the implications of severe head injury and the possibilities for rehabilitation know about the long-term sequelae of brain injury and their effects on learning and how they might be managed **know about other neurological trauma such as brachial plexus injury** **understand the vulnerability of the critically ill child to peripheral nerve damage**	be able to lead initial acute management and transfer appropriately work effectively with the multidisciplinary team and be able to take the lead where appropriate, to manage the medium- and longer-term implications and rehabilitation
Fever or illness in a child with complex disabilities	be aware of the range of diagnostic possibilities, including chest infection, aspiration, gastro-oesophageal reflux, oesophagitis, constipation, hip and joint problems, and dental problems know when and where to get help	be able to assess child with complex disabilities who is unwell be able to recognise important indicators of specific conditions

Ophthalmology

Continuing development from the Level 1 document

- be able to examine the eye and recognise those abnormalities which require urgent referral or treatment
- be able to take a relevant history for a child with suspected visual impairment
- be able to use an ophthalmoscope to recognise an abnormal fundus and lens opacity
- be able to test for colour vision
- understand the microbiology and treatments for common eye infections including orbital cellulitis
- know about the eye manifestations of common genetic and systemic diseases

- recognise and interpret abnormal eye movements
- know about support at school and other resources for children with visual impairments

Change of wording from the Level 1 document

- be able to undertake (*know the principles of*) visual acuity testing at various ages

Acute presentations

The patient presents with:	**Knowledge and understanding**	**Skills**
A red eye	know the common causes of red eye	be able to identify children who need referral be able to initiate investigations and manage appropriately
A possible squint	know the causes of acute onset and the congenital causes of a squint	be able to recognise abnormal alignment of the eyes and examine corneal reflexes know how to refer appropriately
Ptosis	know the congenital and acquired causes of ptosis know how to undertake the Tensilon test	
Proptosis	know the common causes of proptosis	be able to initiate appropriate investigations be able to examine for signs of relevant systemic disease
Abnormal movement	know the ocular and neurological causes of benign abnormal eye movements	be able to interpret clinical findings correctly be able to undertake a full neurological examination where appropriate **know about the implications of nystagmus and refer appropriately for further**

		visual assessment
Abnormal fundus	know the normal appearance of the retina know the value of fundal examination in suspected child abuse cases and certain developmental syndromes **know the non-traumatic causes of retinal haemorrhages and the need for expert evaluation** **recognise papilloedema as a late sign of raised intracranial pressure**	be able to identify papilloedema, abnormal vessels and pigmentation be able to identify haemorrhage
Visual impairment	know the common and preventable causes of visual impairment know about the investigations that might be used to find a cause know about the specific developmental patterns that occur in the child with visual impairment know about educational approaches to the child with visual impairment	be able to recognise congenital cataract and refer urgently for further management have experience of assessment of the child with suspected visual impairment

Palliative Care

Continuing development from the Level 1 document

- be familiar with national and local guidelines on withdrawing and withholding treatment
- recognise factors which determine when care of a patient becomes palliative
- know the importance of seeking advice when treatment may not be in the best interests of a child
- know about appropriate therapeutic intervention in symptom control

- be aware of the ethical issues in therapeutic intervention in children with life-limiting conditions
- know about local opportunities for respite care, including hospice availability
- know the tests for brain stem death
- recognise loss and grief and their effects on the health and well-being of children, families and professionals
- be aware of local bereavement support services
- recognise the skills and experience of other professionals
- acknowledge personal needs for support and the needs of other professionals involved in the care of the dying child for support networks
- understand the need for respect of the wishes of the child or young person particularly when these are different from those of the family and health professionals

Change of wording from the Level 1 document

- know about (*be familiar with*) guidelines on the management of sudden infant death, including the RCPCH Kennedy report

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

- know about the broad definition of palliative care in childhood
- know and follow legal and ethical guidelines relating to withdrawing life support
- recognise factors which determine when care of a patient becomes palliative and be able to contribute to provision of palliative care
- be able to lead the management of acute presentations of sudden unexpected deaths in infancy and childhood and be able to put local procedures into action

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- be able to treat each child on an individual basis rather than by diagnosis
- recognise that children with terminal conditions may be treated on PICU
- understand how intensive care plays a role in supporting the child, the family and referring clinicians

- understand how intensive care clinicians can facilitate discussions regarding the appropriateness of future intensive intervention
- be able to provide symptom relief and comfort to the dying child
- be able to tell the family that the child is dying in a timely and compassionate manner
- have insight into the emotional burden of looking after dying children and their families
- understand the ethical issues surrounding organ donation
- be able to liaise with the transplant coordinator and initiate discussions with the family in a sensitive and timely manner
- be able to take part in bereavement counselling

Respiratory Medicine, with Ear, Nose and Throat

Continuing development from the Level 1 document

- have the knowledge and skills to be able to assess and initiate management of patients presenting with respiratory problems in acute and outpatient settings
- have the knowledge and understanding of factors relating to long-term management of chronic respiratory problems
- understand the life-threatening nature of some of these conditions and when to call for help

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- have a knowledge of the clinically relevant anatomy of the paediatric airway (upper and lower), how it changes with age and the more common congenital abnormalities
- have a knowledge of respiratory physiology and pulmonary mechanics and how these alter with disease and mechanical ventilation
- know the determinants of normal gas exchange, how disease may effect these, which therapies may work to improve these and how they work
- know the parameters that are calculated and used to assess severity of illness

- know the importance and mechanism of cardiopulmonary interactions in the self ventilating and ventilated child with respiratory disease
- be able to assess a child to determine the need for respiratory support
- be able to institute respiratory support or advise referring clinicians accordingly
- be able to tailor ventilatory strategy according to pathophysiology of the underlying respiratory condition
- be able to assess severity of illness and monitor a patient ventilated for severe respiratory disease
- know of emergency interventions for respiratory crises and indications for their use
- understand the use of bronchoscopy in the diagnosis and management of respiratory failure
- know the prognoses of respiratory conditions admitted to PICU including HIV associated pneumonia
- be aware of the current options for and issues surrounding long term respiratory support

Acute presentations

The patient presents with	**Knowledge and understanding**	**Skills**
Sore throat and / or mouth	know the causes of these complaints know appropriate therapies	be able to manage these conditions recognise features in the presentation which suggest serious pathology
Nose bleeds	know the common causes of nose bleeds	recognise those with underlying pathology
Snoring and obstructive sleep apnoea	know the causes of snoring and be aware of complications of this presentation understand the indications for sleep studies	be able to refer appropriately to an ENT surgeon **manage the airway appropriately** **instigate investigations for pulmonary hypertension**
Earache	know the common causes and	recognise an abnormal ear drum

	complications know the risk factors for otitis media with effusion understand the vulnerability of children with cleft palate, Down's syndrome and other cranio-facial conditions	be able to manage this condition be able to treat with antibiotics where appropriate recognise when to refer to audiology specialists or an ENT surgeon
Acute stridor	understand the potentially life-threatening nature of this condition know about allergic and infective causes, for example epiglottitis, laryngotracheitis, retropharyngeal abscess, and foreign body **understand the significance of different airway noises** **know the indications for airway intervention and anaesthetic considerations including gas induction** **know the indications for adjuvant therapy and how they work**	be able to manage this condition recognise when to request help from a specialist colleague, anaesthetist or ENT specialist recognise children with existing chronic upper airway problems **be able to distinguish stertor, stridor and wheeze** **recognise the child requiring airway intervention** **manage the airway and transport safely** **recognise the child who requires urgent ENT intervention** **advise parents of the likely diagnosis and/or interventions required and length of ventilation** **deal with post-extubation stridor**
Acute severe asthma	know and be able to apply the British Thoracic Society guidelines for management	be able to assess the severity of an asthma attack be able to institute appropriate emergency treatment

	know the pathophysiology of acute severe asthma including the importance of mucus plugging **know the abnormalities of lung mechanics and resulting abnormal gas exchange pattern** **know the goals of therapy including ventilation** **know the mechanism of action of adjuvant therapies indications for use and important side- effects and/or complications that may result** **know the principles of safe anaesthesia in this situation** **understand the risks of repeated PICU admission and the need for follow up by a respiratory specialist**	be able to lead treatment of severe asthma and review ongoing treatment before discharge recognise when more specialist help is needed **be able to assess the need for and institute respiratory support** **initiate a ventilatory strategy for air trapping and be able to monitor this** **employ crisis manoeuvres** **institute swift weaning as child improves**
Lower respiratory tract infection, including pneumonia' bronchiolitis and pertussis	know the causes of respiratory tract infections know appropriate therapies know indicators of severity **understand pathophysiology, respiratory mechanics and gas exchange abnormalities in these**	be able to manage these infections be able to recognise patients requiring intensive care be able to recognise complications, for example, empyema and manage appropriately **recognise undiagnosed co-existing problems presenting as LRTI**

	conditions **know the non-respiratory complications of RSV infection** **know the differential diagnosis for the infant presenting with apnoea**	**be able to advise on management strategy which may prevent need for ventilation** **be able to recognise on clinical grounds the need for respiratory support** **employ appropriate ventilatory strategies** **recognise the child who might benefit from advanced respiratory support and therapies**
Respiratory failure and Respiratory Distress Syndrome [ARDS]	know the indications for acute and long-term ventilatory support be aware of the agreed resuscitation plans for individual patients **know the defining characteristics, pathophysiology and causes of ARDS** **know the principles and debates surrounding ventilatory strategies** **know the mechanism of action and effectiveness of adjuvant therapies** **know the acute complications of ARDS** **know the long term effects on lung function**	**initiate** urgent assessment and treatment including assisted ventilation liaise with more senior paediatricians, anaesthetists and intensivists when appropriate **implement appropriate ventilatory strategies** **recognise the associated multi-organ dysfunction and support as appropriately** **recognise the child who may require extracorporeal support**

Transport and Retrieval of the critically ill child

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand why a child might require inter-hospital transfer
- be able to organise the logistics of a retrieval from referral call to return to PICU
- be able to triage and prioritise referral calls ensuring the child is ultimately cared for in the most appropriate environment
- be able to communicate effectively with referring clinician and receiving PICU
- recognise and minimise the potential risks involved in transfer both to the patient and the team
- be able to lead the retrieval team in assessment, stabilisation and transfer of the critically ill or injured child from one location to another
- understand the need to retain an open mind regarding diagnosis
- understand the need for clear documentation
- understand the medico-legal implications of retrieval
- monitor and respond to changes in vital physiological functions during transfer
- be able to plan ahead for likely events during transfer
- be able to trouble shoot equipment failure
- be able to recognise the limits of their own experience and expertise, drawing on appropriate resources at the referring hospital if necessary
- understand the need for stabilisation prior to transfer but be able to recognise the child in extremis who requires specialist life saving intervention and urgent transfer
- understand the stressful nature of transfer on both the awake child and the family
- take steps to reduce parental anxiety through clear communication, calm demeanor and minimising their time spent separated from the child
- know about vehicle safety features
- know about specific issues surrounding air transport

Retrieval of the child with	Knowledge and understanding	Skills
Multi-trauma including head injury	**understand need to identify all sources of cardiorespiratory compromise prior to transfer** **understand head injury alone does not cause CVS instability** **understand which head injuries are time critical**	**ensure all major injuries temporised prior to transfer** **ensure cervical spine immobilisation in any child at risk of cervical spine trauma** **recognise the child with the time critical head injury from referral consult** **assist with logistics of head injury transfer and be available for advice**
Shock	**understand the need for early intervention in the shocked child to improve outcome** **understand how the importance of positive pressure ventilation**	**be able to elicit signs of shock over the phone and give appropriate advice** **be able to gain central access in the shocked child** **be able to deal with fluid and inotrope resistant shock** **be able to consider the most likely pathogen in septic shock and treat accordingly** **be able to recognise toxic shock syndrome and necrotising fasciitis**
Upper airway obstruction	**understand the risks of transferring a child with inadequate airway (intubated or not)** **understand the principles of the use of heliox**	**be able to elicit the most likely diagnosis from the referral call** **be able to seek specialist help where necessary** **be able to intubate the**

	know the indications for intubation and the special precautions required	**child with upper airway obstruction**
Respiratory failure	**know crisis manoeuvres which may be employed in severe respiratory failure**	**be able to hand ventilate the child with severe asthma or ARDS during transfer**
Non-traumatic brain injury and raised intracranial pressure	**understand that acute hydrocephalus requires urgent neurosurgical intervention** **know the signs of raised intracranial pressure**	**be able to elicit an accurate assessment of level of consciousness and other signs of raised ICP over the phone** **recognise signs of raised intracranial pressure and institute strategy and/or advise measures to control this** **recognise time-critical lesion from referral call and assist in logistics of urgent transfer**
Status Epilepticus		**be able to monitor child post-intubation for clinical signs of seizure activity** **be able to balance benefits and risks of muscle relaxation during transport**

Trauma and Poisoning

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the injuries that commonly occur in children, whilst appreciating that unusual injuries are easily missed with important consequences

- maintain a high index of suspicion of serious occult injury in any child with suggestive history
- be able to elucidate nature and extent of injuries from referral communication
- be able to triage the patient to the correct tertiary centre appropriate to the injuries sustained
- be able to identify and treat life-threatening injuries using a structured approach
- know the natural history of specific injuries
- know the value of investigations performed, their indications and how they should be interpreted
- liaise effectively with other specialities involved
- be able to transport the seriously injured child after resuscitation and stabilisation to the appropriate centre
- be able to counsel the parents as to the extent of the child's initial injuries, where the child is being taken and what interventions may take place
- appreciate the difficulty of giving prognostic information in the early stages

The patient presents with:	Knowledge and Understanding	Skills
Multi trauma	**understand characteristics of spinal injury in children including Spinal cord injury without radiological abnormality (SCIWORA) and importance of cervical spine immobilisation** **know the symptoms and signs of spinal injury and investigations** **understand the importance of wide-bore vascular access for rapid fluid resuscitation** **know the longer term complications of severe trauma** **understand the pathophysiology of hanging injury and resulting cerebral injury**	**be able to identify and immobilise cervical spine appropriately** **be able to treat life-threatening problems as they are identified in the primary survey** **be able to intubate with c-spine control using rapid sequence induction** **be able to gain effective vascular access quickly** **be able to transport the patient safely for imaging** **be able to perform a secondary survey** **recognise the need for urgent specialist input**
Burns	**know the different types of burn injury** **understand the complications of burns to special areas including airway burns** **understand the systemic effects of severe burns** **know the methods used to assess degree and extent of burn** **understand that initial cardiovascular compromise may be due to another cause other than the burn itself** **understand the mechanism of carbon monoxide and cyanide poisoning**	**be able to assess airway involvement and seek expert help if required** **be able to gain effective vascular access including where necessary the use of an intraosseousneedle** **be able to assess the extent and degree of burns and specific areas needing urgent intervention** **be able to implement fluid resuscitation and tailor according to response** **recognise and treat pain effectively**

	understand the importance of nutritional support and infection control **understand the long term sequelae of burns**	**be able to search for other injuries** **be able to manage carbon monoxide poisoning** **be able to liaise with plastic surgeons early and manage injured areas**
Drowning	**understand the pathophysiology of near-drowning and resulting cerebral and lung injury** **understand the prognostic indicators and their limitations** **understand the implication of hypothermia and methods used to re-warm** **know the likely causes of secondary pneumonia**	**be able to manage the patient with lung injury and provide neuroprotection** **be able to identify and treat secondary infection** **be able to identify the need for bronchcoscopy**
Head injury	**know the mechanisms of primary injury and secondary injury** **know the symptoms and signs of serious head injury** **know the association with cervical spine injury and other occult injuries** **know the effects of injury on cerebral blood flow** **know the indications for intubation** **know the indications for neurosurgical referral and urgent intervention** **know the signs of raised intracranial pressure**	**be able to immobilise the cervical spine** **be able to intubate and ventilate** **be able to instigate neuroprotective measures** **be able to recognise and treat signs of raised ICP and interpret ICP monitoring** **be able to exclude other injury** **be able to interpret a Brain C.T. Scan** **recognise the need for urgent transfer to a**

	know about ICP monitoring : devices and the value of their use **know about adjunct therapies e.g. hypothermia/osmotherapy** **know the prognostic indicators and outcomes**	**neurosurgical centre**
Possible poisoning	**understand the clinical features of most commonly ingested poisons** **know which drugs are lethal in a dose for children**	**be able to consider ingestion as a differential diagnosis in any acutely ill child of unknown cause** **be able to institute appropriate supportive therapy** **be able to liaise with toxicologists regarding specific interventions** **be able to send the most appropriate samples for testing**

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

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

They will be able to perform the following procedures if involved in the provision of neo-natal care

- intubation of extremely immature babies or those with congenital malformation of head and neck
- drain a pneumothorax in babies and older children
- neonatal chest drain insertion
- exchange transfusion (full and partial)
- cranial ultrasound scanning

- cerebral ventricular tap
- abdominal paracentesis

Competences specific to speciaity

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will be able to perform the following procedures independently:

- be able to perform and interpret an atrial electrogram
- be able to set up and check the temporary in the post-operative patient
- Naso-jejunal (NJ)tube insertion
- defibrillation

- intubation of babies and older children (oral and nasal routes)
- tracheostomy tube change
- peripheral long line insertion
- central venous line insertion
- vascath insertion for renal support
- emergency pericardiocentesis
- use of nerve stimulator to assess neuromuscular block

They may need supervision for:

- Sengstaken tube insertion
- use of the anaesthetic machine and inhalational anaesthesia
- emergency cricothyroidotomy
- Intracranial pressure monitoring (ICP)
- bolt insertion
- flexible bronchoscopy

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

Competences specific to the specialty

By the end of Level 3 Training in Paediatric Intensive Care Medicine, trainees will:

- understand the pharmacology of drugs used in critical care
- understand how severe illness effects the distribution and handling of drugs and alter prescriptions accordingly
- know the pharmacokinetics and pharmocodynamics of drugs used on the PICU
- understand the risks of drug interaction on PICU
- understand how individuals vary in their ability to metabolise drugs
- understand the risks of dependence and physical withdrawal symptoms from certain sedative drugs
- be able to construct safe weaning plans for drugs used on the PICU where indicated

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