

# **A Framework of Competences for the Level 3 Training Special Interest Module in Paediatric Nephrology**

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[www.rcpch.ac.uk](http://www.rcpch.ac.uk)

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## **Section 1            Introduction**

### **Who is this book for?**

It is for doctors at Level 3 in their General Paediatric training who wish to work towards an expertise in Paediatric Nephrology during Level 3 training. It is also there to guide tutors and educational supervisors.

### **Why do I need it?**

This book gives you and your tutors' guidance about the competences you need to cover **in addition** to the Framework of Competences for Level 3 Training in General Paediatrics. It gives you a clear picture of what you have to achieve by the end of this module of training in order to have expertise in this area.

### **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 you cover all areas you need to. It should be used by Schools and Educational Supervisors to ensure that a programme of training is developed in Level 3 which will allow the trainees to achieve these competences. In determining this programme, liaison with the relevant CSAC is important. In the appendix, there is guidance for training in the module which the programme must adhere to.

### **Progression**

Following completion of Level 3 training and the module, the CCT holder should be competent to take up a post as a General Paediatrician or a General Paediatrician with a Special Expertise in this area. It is expected that there will be a requirement in paediatric services for consultants with special expertise provided by the module. Such posts will usually form part of a Regional Specialty Network including working with accredited sub-specialties in this area.

### **A note about the format of this document**

This framework sets out the additional competences which should be achieved by the end of Level 3 training. The trainee also has to achieve all the competences in the Level 3 General Paediatric Framework

### **Assessment**

The RCPCH Assessment Strategy (PMETB approved) for Level 3 Training will be used. Trainees working with their educational supervisors should ensure that the Assessment Strategy is tailored to cover the area of Special Expertise as well as General Paediatrics and that learning and assessment are well documented within the e-portfolio.

### **Pilot**

This special expertise module is being introduced as a pilot. The College will be seeking feedback from the Trainees, Educational Supervisors, Schools of Paediatrics, CSACs and potentially in future from Employer NHS Trusts and Regional Networks. This will look at:

1. Need for training in this module
2. Addition or omission of competences unique to the module
3. Feasibility of delivering the module within Level 3 General Paediatric training
4. Usefulness of the standards for training for the module.
5. Outcome of trainees undertaking the module
6. Need for revision of the competences
7. Need for further assessment

## **Section 2            General Competences**

### **Knowledge and Understanding**

- Understand the embryology and development of the genito-urinary system
- Know the anatomy and structural abnormalities of the genito-urinary system
- Understand salt and water metabolism in the fetus and the transitional events of birth
- Understand the normal regulation of plasma electrolytes, calcium phosphate and acid-base regulation in premature babies, neonates, infants and children
- Understand disorders of calcium and bone metabolism especially those induced by kidney disease
- Understand normal maturation of renal vascular, glomerular and tubular physiology and their roles in achieving homeostasis
- Understand the structural adaptation of the kidney to reduced renal mass
- Appreciate the role of surgical and radiological intervention in the management of nephro-urological conditions
- Know and understand the role of nephro-urological imaging techniques, their interpretation and limitations
- Understand the regulation of blood pressure
- Understand the genetic and immunological basis of renal disease
- Understand the indications for a renal biopsy, and know its complications.
- Understand the pharmacology and range of side-effects of the major groups of agents used to manage nephrological disease, including diuretics, anti-hypertensives and immuno-suppressants.
- Understand the normal adaptive response of the kidney to fluid and electrolyte disturbance.
- understand the disorders of the kidney that cause fluid and electrolyte disturbance and know the endocrine diseases associated with

electrolyte imbalance

- Know that child abuse may present with a range of nephro-urological symptoms, including urinary tract infection and disturbances of bladder control.

### **Skills**

- Develop the skills, knowledge and understanding appropriate to the competencies detailed in section 4 of this document.
- Be able to supervise nurses and carers in the technique of collecting urine samples from children suitable for bacteriological investigation
- To be able to insert a urinary catheter
- Be able to perform urinalysis and teach this to children, young people and parents
- Be able to liaise with other professionals, as required, in the investigation and management of nephro-urological conditions
- Be able to refer families to appropriate resources for the management of complex nephrology and nephro-urological conditions
- Be able to develop care pathways for the investigation and management of urinary tract infection
- To be able to take a blood pressure, and supervise others in learning the skills involved, including how to use reference tables for normal values in children
- Be able to provide dietetic advice for patients with renal disease, in conjunction with a multi-disciplinary team, as appropriate.
- Be able to recognize immune-mediated renal diseases and understand specific therapies in their management
- Be able to treat and manage fluid and electrolyte imbalances in renal and non-renal diseases
- Be able to advise other clinicians on the diagnosis and management of fluid and electrolyte disturbance
- Be able to investigate and manage metabolic bone disease, particularly that associated with renal disease, in liaison with tertiary specialists as clinically indicated.

### **Values and Attitudes**

- Be able to work seamlessly with colleagues in tertiary care and other members of the multidisciplinary team so that there is clear communication with children and their parents/carers
- Be aware of the emotional impact of interventions such as intermittent catheterisation and supplemental feeding on children/teenagers and parents/carers, and be able to work with them, and other professionals, in ameliorating this impact
- Appreciate the ethical issues surrounding organ donation and be aware of issues relating to compliance and concordance.

### **Leadership and Management**

- Be able to lead local multidisciplinary teams as appropriate in the care of infants and children with different types of renal disease, including patients with antenatally detectable renal problems.
- As a paediatrician with “special expertise”, have a particular appreciation of the importance of liaison with both local generic paediatric services and specialist medical support elsewhere, and to be able to manage and support such “networks”.

### **Communication Skills in Paediatrics**

- Communicate clearly and empathetically to patients / parents / carers, the nature of a renal condition be it acute, chronic or relapsing, or detected through antenatal or postnatal screening, this to include, as appropriate, the illness prognosis and the need for monitoring, and, for any therapeutic interventions, their benefit and side-effects.
- Appreciate the particular communication and relationship skills required for the ongoing management of patients within a clinical network
- Understand and appreciate the counselling of families about renal replacement therapy, including the benefits and risks of haemodialysis.

## **Section 3            Specific Clinical Competences**

### **Development**

- Understand the possible impact of renal disease on the emotional and physical well-being of the child and family, and on their later life, including the potential for reduced independence, educational and employment issues

### **Educational development**

- Understand the impact of renal disease and its treatment on educational development and be aware of strategies to minimise this

### **Growth and Nutrition**

- Understand, and be able to identify and manage, the multiple factors affecting growth and development in chronic renal disorders
- Understand the dietary restrictions appropriate to different renal disorders
- Understand the principles of nutritional support including supplementation and different modes of enteral feeding
- Be able to monitor growth and liaise with the wider nutritional team, to optimize growth in patients with renal disease
- Be familiar with the role of growth hormone in growth failure in chronic renal disease, and be able to work with appropriate specialist colleagues in its administration and monitoring
- Understand the importance of final height to the child, or young person, with renal disease, and appreciate the need to identify this as a high priority treatment goal.

### **Adolescence**

- Understand that experimental adolescent behaviour can lead to clinical problems in renal disease, including an increase in transplant rejection and loss, and to appreciate management strategies to help minimise these issues, including the importance of developing effective transition to adult renal services.

## **Section 4                    Condition-specific Competences in Special Expertise in Paediatric Nephrology**

### **Urinary tract**

#### **Urinary tract structure**

- Know the normal development of the upper and lower renal tract, and understand the pathology of major renal tract anomalies.
- Understand the significance of genital abnormalities, ambiguous genitalia and intersex, and their associations with renal and other diseases.

#### **Urinary tract infection**

- Have a good understanding of current theories and controversies on all major aspects of the pathology of urinary tract infection (UTI), including microbiology, epidemiology and host-defence factors.
- Understand the possible long term consequences of UTI, including the secondary progression of renal damage.
- Have a detailed current knowledge of the presentation, diagnosis and management of UTI throughout childhood, including diagnostic criteria, the significance of different age-groups, , acute and ongoing management, and prevention.
- Understand the significance of vesico-ureteric reflux (VUR), renal dysplasia, voiding and bladder abnormalities, and obstructive lesions.
- be able to counsel families on the inheritable nature of VUR
- Be able to coordinate a local UTI management service, appreciating the importance of current local, regional and national UTI guidelines.

#### **Antenatally detected conditions**

- Know the range of urinary tract conditions that can be detected antenatally.
- Know the pre- and post-natal presentation and management of antenatally- detectable renal problems
- Know the organization of antenatal and post-natal care, and be able to lead a local multi-disciplinary team in the care, of infants with

antenatally detected renal problems.

### **Disorders of micturition**

- Know the physiology of normal micturition, and understand the normal acquisition of bladder control.
- Know the pathophysiology of the different types of bladder dysfunction.
- Understand the role of investigation of disturbed micturition, including imaging and urodynamics.
- Understand the appropriate medical and surgical management of different types of bladder dysfunction.
- Understand management strategies for the various forms of intermittent urinary incontinence, including behavioural and pharmacological therapies.
- Appreciate the role of the multi-disciplinary community continence team, and understand the functions of the paediatrician in such a team.

### **Haematuria and Proteinuria**

- Know the causes of and appropriate investigations for haematuria and proteinuria.
- Understand glomerular and tubular handling of protein.
- Be able to differentiate between pathological and physiological proteinuria, and develop a diagnostic care pathway.
- Be able to lead and co-ordinate investigation and management of a child with haematuria and/or proteinuria, appreciating the role of the paediatric nephrologist, particularly in patients being considered for renal biopsy.

### **Nephrotic syndrome**

- Know and understand the pathophysiology of the nephrotic syndrome.
- Appreciate the different forms of childhood nephrotic syndrome.
- Know the initial investigations, and current management of nephrotic syndrome, and the know the indications for renal biopsy.
- Be able to detect and manage the associated complications of the nephrotic state.

- Be able to lead the long term management of steroid-sensitive nephrotic syndrome, appreciating the role of the paediatric nephrologist in the “shared care” of complicated cases.

### **Hypertension**

- Understand the techniques of blood pressure measurement, their advantages and limitations.
- Know the renal and non-renal diagnoses implicated in hypertension in different age groups, and the mechanisms causing primary (essential) and secondary hypertension.
- Be able to diagnose acute and chronic hypertension, taking into account normal blood pressure data in children.
- Understand the principles of the investigation and management of acute and chronic hypertension, including hypertensive crises, encephalopathy and cardiac failure, and appreciate the involvement of a paediatric nephrologist in more complex cases.

### **Nephrolithiasis and Nephrocalcinosis**

- Understand the aetiology of renal stone formation and nephrocalcinosis, including underlying metabolic and genetic disorders.
- Understand the acute and chronic, medical and surgical management of renal stones.
- Be able to investigate and manage the child with renal stones and nephrocalcinosis, in conjunction with urologists and paediatric nephrologists when appropriate.

### **Tubular disorders**

- Know and understand the different causes and clinical presentations of primary and secondary tubular disorders.
- Know the principles of the investigation and management of tubular disorders.
- Understand the special issues of tubular function and dysfunction of the premature and sick newborn.

### **Other renal disorders**

- Appreciate the pathology, including where relevant the genetics, and know the presentation, initial investigation and management, of a wide range of (other) renal disorders including those given below, and understand the role of the paediatric nephrologist in more complex cases:
  - Glomerulopathies
  - Vasculitis
  - Haemolytic-uraemic syndrome
  - Interstitial nephritis
  - Renal cystic disease

### **Renal Failure**

#### **Acute renal failure**

- Know the causes and presenting features of acute renal failure (ARF).
- Know the complications of ARF, and be able to initiate emergency management of such complications, including hyperkalaemia and fluid overload.
- Be able to manage uncomplicated cases of ARF, and understand the role of the paediatric nephrologist in the management of more severe cases.
- Know the indications for dialysis.
- Appreciate the nephrological support required in the management of patients with multi-organ failure or systemic disease, and have a keen understanding of the indications for transfer of patients for specialist renal care.
- Be able to liaise with a local specialist paediatric or neonatal intensive care service about patients with renal problems, and appreciate the role of a paediatric nephrologist in severe or complex cases.

#### **Chronic renal failure**

- Know and understand the presentation, clinical course and prognosis of diseases causing chronic renal failure.

- Be able to initiate the investigation of chronic renal failure
- Know the principles of the assessment of the degree of renal failure, and the monitoring of its progression.
- Be able to manage mild chronic renal failure, appreciating the role of timely coordination with a paediatric nephrology service.
- Understand the pathophysiology of systemic complications, including bone disease and anaemia.
- Know the principles of the management of the effects of chronic renal failure including biochemical disturbance, renal bone disease and anaemia, and understand the management of growth and nutrition.
- Appreciate the importance of cardiovascular risk factors including hyperlipidaemia and hypertension.

### **Dialysis and Plasmapheresis**

- Understand the principles of peritoneal dialysis, haemodialysis, and plasmapheresis.
- Appreciate the range of people involved in delivering such services.
- Appreciate the range and diversity of invasive renal services available across the UK.

### **Transplantation**

- Understand the principles of the pre-transplantation “work-up” of patients.
- Appreciate the principles involved in the transplantation procedure (cadaveric and live-related donor), and of management in the post-operative period.
- Understand the principles involved in the long term ongoing management of post-transplant patients, including the effects and risks of immunosuppression.

## **Section 5                      Practical Procedures and Investigations**

- Know the practicalities, limitations and special precautions of tests of renal function
- Be able to take a BP in neonates, infants and older children
- Be able to catheterise the urinary bladder, and appreciate the special issues associated with artificial bladder conduits
- Understand the procedures involved in imaging techniques in nephro-urology,
- Have appropriate current knowledge of potential hazards of radiological investigations and have an understand of the general governance and licensing of these investigations
- Be able to interpret glomerular filtration rate (GFR) from formal clearance techniques and by estimation from height
- Be able to conduct and interpret tests of tubular function
- Know and understand the role of uroflowmetry and urodynamics in disorders of micturition
- Understand the procedures involved in a renal biopsy.
- Understand the principles of peritoneal dialysis, haemodialysis, and plasmapheresis

### **Pharmacology and Therapeutics**

- understand the renal handling of drugs
- understand how renal disorders affect drug pharmacokinetics
- understand how different drugs affect the kidney
- be able to adjust drug prescription in accordance with renal function
- appreciate how dialysis or plasmapheresis affects drug pharmacokinetics
- be able to work with pharmacists and nursing staff to promote safe prescribing, including informing other health professionals of the implications of prescribing in renal disease

## Appendix 1

### Paediatric Guidance Checklist

These standards were derived to assist in the assessment of the paediatric training standards of in your deanery

**Specialty:** Special Study Module in Nephrology

**The Programme (which may consist of several posts) should provide:**

<b>1. Supervision</b>	✓/x
<b>1.1</b> An educational supervisor that is a Consultant Paediatric Nephrologist trained in assessment and appraisal	
<b>1.2</b> An educational supervisor who provides 1PA per 4 trainees per week of educational supervision	
<b>1.3</b> Evidence that the assessment strategy is being delivered	
<b>1.4</b> Trainers receive appropriate training on the delivery of the assessment strategy	
<b>1.5</b> Clinical Supervision ensures Patient Safety	
<b>2. Other Personnel</b>	
<b>2.1</b> A minimum of 2 consultants in Paediatric Nephrology to support and supervise and/or a consistent General Paediatrician with expertise working as part of a Regional Network	
<b>2.2</b> More than one ST4 -8 in the children's department	
<b>2.3</b> Access to a full multi-disciplinary team for training to include a dietician, pharmacist and psychosocial support personnel	
<b>3. Service requirements and facilities</b>	
<b>3.1 Specialty specific requirements of subspecialty department:</b> Haemodialysis, peritoneal dialysis, renal transplantation	
<b>3.2 Specialty specific requirements of related clinical departments that are involved in delivery of the curriculum:</b> Regional Network arrangements/shared care. Close links with biochemistry	
<b>3.3 Specialty specific requirements of service departments relevant to delivery of curriculum (e.g. investigation department , PAMs departments, surgery or anaesthesia):</b> Clinical	
<b>3.4 Specialty specific requirements of clinical networks:</b> Functioning regional network with outreach clinics	
<b>4. Educational activities and training</b>	
<b>4.1 Specialty specific clinical exposure required to provide sufficient learning opportunities</b> (NB if giving workload data ensure it is explicit whether this is number per annum or number trainee would be expected to be exposed to over entire programme): Participation in the investigation of bladder function Renal in-patient experience including on-call	
<b>4.2 Specialty specific requirements for structured training opportunities to include courses:</b>	
<b>4.3 Specialty specific requirements for other experiential learning(excluding clinics and ward rounds):</b> Participation in paediatric nephrology training days	

<b>5. Working patterns</b>	
<b>5.1</b> Safe cover arrangements for paediatric department out of hours in line with RCPCH guidance	
<b>5.2</b> Evidence of compliance with existing employment rules to working time	
<b>5.3</b> Working intensity and pattern that is appropriate for learning	
<b>5.4</b> Access to sub-specialty training time which allows achievement of the competences throughout the programme	
<b>5.5</b> the post forms part of a complete paediatric training programme which provides a minimum of 5 years acute clinical experience, including out of hours duties	

<b>6. Specific Post requirements</b>	
<p><b>6.1</b> A trainee will require a full eighteen months of paediatric nephrology experience of which:</p> <ul style="list-style-type: none"> <li>• at least 6 months will be spent on a regional nephrology centre</li> <li>• at least 6 months will be spent in a specific renal attachment outside a regional paediatric nephrology environment (usually within a general paediatric rotation)</li> <li>• up to 6 months in a neonatal unit, paediatric intensive care unit or other relevant environment , as long as there is ongoing renal supervision and exposure to renal outpatients.</li> </ul>	

<p><b>7. Enabled to learn new skills, necessary skills and curriculum coverage (speciality specific)</b>  <i>This section can be used to highlight marker conditions to which trainee should be exposed or the numbers of cases/procedures that trainee will be expected to see/do. Ensure that it is clear whether any numbers are for whole training programme or per annum</i></p>	
<p><b>7.1 Specialty specific marker conditions trainee should be exposed to:</b> Relevant inpatient experience outside the paediatric nephrology centre to include newly presenting nephrotic and nephritic syndromes, pyelonephritis and the initial management of acute renal failure</p>	
<p><b>7.2 Specialty specific skills/procedures trainee needs to complete:</b></p>	
<p><b>8. Access to clinics and ward rounds and long term care of patients</b></p>	
<p><b>8.1 Specialty specific numbers and types of clinics expected to attend (including outreach clinics):</b>                  Regular outpatient clinic experience to include:                  General nephrology                  Primary care referrals with common problems                  Antenatally detected renal disorders                  Chronic renal failure and transplantation                  Specialist clinics managing children with continence disorders</p>	
<p><b>8.2 Specialty specific combined clinics expected to attend:</b>                  Shared clinics involving the paediatric nephrologist in outlying hospitals                  Shared nephro-urology clinics</p>	
<p><b>8.3 Specialty specific ward rounds consultant led and independent per week:</b></p>	
<p><b>8.4 Specialty specific involvement in transitional care:</b>                  Participate in the development of arrangements for the transition of young people with renal disorders from paediatric to adult care</p>	
<p><b>9. Meetings</b></p>	
<p><b>9.1 Specialty specific number and types of MDT meetings expected to be exposed to:</b></p>	

Regular meetings at which renal imaging results are discussed	
<b>9.2 Specialty specific multi-professional meetings expected to be exposed to:</b> As above	
<b>9.3 Speciality specific other meetings:</b> National renal meetings	

<b>10. Clinical audit</b>	
<b>10.1</b> Evidence of trainees participation in clinical governance (at least 1 full audit/year and attendance at critical incident meetings)	
<b>10.2</b> Evidence of trainees participation in clinical guideline development	

<b>11. Teaching appraising and assessing</b>	
<b>11.1</b> Opportunities for formal and informal teaching	
<b>11.2</b> For senior trainees: opportunities for involvement of assessment of others	
<b>11.3</b> For senior trainees: opportunity to be involved in the appraisal of others	
<b>11.4</b> Assistance in medical student exams or teaching programmes	
<b>11.5</b> Take the lead role locally in the education and training of other paediatricians, nursing and other staff in the management of common nephro-urological problems	

<b>12. Research</b>	
<b>12.1</b> Provide formal teaching on research ethics and research methodology	
<b>12.2</b> Provide opportunities to be involved in clinical research	

X-ref	Comments