

**RECOMMENDATIONS FOR THE TRAINING OF EUROPEAN PAEDIATRIC  
NEPHROLOGISTS BY THE EUROPEAN SOCIETY  
FOR PAEDIATRIC NEPHROLOGY**

An outline of the minimal requirements for accreditation  
in the European Countries

**SUMMARY**

This document defines a pediatric nephrologist (section 1), duration of training program (section 2), and its content (section 3). The training requirements for general recognition in Europe (within and without the EC) as a pediatric nephrologist and for accreditation in the specialty by the European Economic Commission are set out (section 4).

Requirements for institutions offering Pediatric Nephrology training (section 5) are summarised.

**1. INTRODUCTION**

A pediatric nephrologist is a trained pediatrician specialised in the investigation and treatment of children with renal and urinary tract diseases, renal failure, electrolyte and fluid disorders and arterial hypertension. His place of work will normally be an established pediatric nephrology unit. This should offer a full range of renal diagnostic facilities and facilities for treatment of acute and chronic renal failure in children and will usually be part of an academic department of pediatrics, in which research is an integral activity and in which nephrology is linked with other pediatric subspecialties.

**2. DURATION OF THE TRAINING PROGRAM**

This must fulfill the requirements of the country of registration as a pediatrician and must include at least 3 years training in Pediatrics, including neonatology and intensive care. The number of years devoted exclusively to pediatric nephrology training should comprise a minimum of 3 years of professional training.

**3. TYPE OF WORK OF PEDIATRIC NEPHROLOGIST AND SPECIFIC EXPERTISE**

The age of patients ranges from foetal life to the end of the adolescent period. The specific expertise of pediatric nephrologists makes them uniquely qualified to investigate and treat renal disease and its myriad consequences in children from the neonatal stage and throughout growth and development.

**3.1 Specific clinical expertise**

The practice of pediatric nephrology includes:

**3.1 Investigation and non-surgical treatment of patients with the diagnosis and management of:**

**3.1.1 congenital and acquired renal disease**

**3.1.2 disorders of glomerular and tubular function**

**3.1.2.1 molecular biology and genetic aspects of renal diseases**

**3.1.3 metabolic consequences of renal failure**

**3.1.3.1 acute renal failure**

- 3.1.3.2 chronic renal failure
- 3.1.4 treatment of chronic renal failure
  - 3.1.4.1 by peritoneal dialysis
  - 3.1.4.2 by hemodialysis /continuous renal replacement therapy
  - 3.1.4.3 by transplantation: pre-, postoperative and long-term outpatient care
- 3.1.5 clinical epidemiology, prevention of renal disease: e.g. by screening programmes
- 3.1.6 fluid and electrolytes/acid and base disorders
- 3.1.7 blood pressure/hypertension
- 3.1.8 nutrition in patients with renal disease
- 3.1.9 urinary tract infection
- 3.1.10 urinary stone diseases
- 3.1.11 genetic renal diseases
- 3.1.12 metabolic disorders affecting the kidney
- 3.2 Specification of duties of the Pediatric Nephrologist

#### 3.2.1 Patient care:

Specialised knowledge and skills are essential, both for diagnosis and related procedures and for treatment.

##### 3.2.1.1 *Diagnosis:*

History and physical examination, urinalysis and urine microscopy, needle renal biopsy and familiarity with renal histopathology and interpretation of urinary tract imaging. Measurement of glomerular filtration rate and assessment of tubular functions. Performance of renal ultrasound is advantageous.

##### 3.2.1.2 *Treatment:*

3.2.1.2.1 Management of glomerular and tubular diseases, body fluid and electrolyte disorders and diseases of the urinary tract.

3.2.1.2.2 Hypertension.

3.2.1.2.3 Maintenance of growth and physical and mental development in children with renal disease.

3.2.1.2.4 Application of renal replacement therapies in children with acute and chronic renal failure and other non-renal disorders. Placement of acute PD and acute hemodialysis catheters are desirable.

3.2.1.2.5 Medical management of renal transplantation (pretransplant workup, indication, preparation, post-op care, management of immunosuppression/medical complications, transplant follow-up).

3.2.1.2.6 Ethical issues in the management of patients with renal diseases

3.2.1.2.7 Management of critically ill children with renal involvement in an intensive care setting

3.2.1.2.8 Management of children with enuresis and dysfunctional bladder syndromes

#### 3.3 *Teaching:*

The pediatric nephrologist is responsible for the education of students and junior doctors in the fields of renal development, function and diseases in infants, children and adolescents. Teaching extends to pediatricians and trainees in pediatrics and pediatric nephrology and to trainees in primary health care and obstetrics, to nurses and paramedical personnel and also to public education focused on the prevention of kidney disease.

#### 3.4 *Scientific work:*

The pediatric nephrologist may be engaged in basic or clinical research in congenital and acquired renal disease. Research in nephrology frequently requires collaboration with other disciplines while the small number of patients often necessitates collaboration in multi-centre studies with other pediatric nephrology units. The pediatric nephrologist may investigate population-based (epidemiological-preventive) medicine.

### *3.5 Management:*

3.5.1 The organisation and running of the nephrology department including its economic aspects. Promoting support by health system programs for the treatment of children with renal disease, contribution to the cost-effective implementation of those programs.

3.5.2 Evaluation (audit): Maintenance of accurate records of the clinical activity of the department to permit audits of clinical activity and administrative efficacy of the nephrology department.

The pediatric nephrologist consults and collaborates with other disciplines such as pediatric urologist, transplant surgeon, cardiologist, endocrinologist, adult nephrologist, dietician, pharmacist, psychologist, social worker and school teacher.

## **4. TRAINING REQUIREMENTS FOR ACCREDITATION IN PEDIATRIC NEPHROLOGY**

### *4.1 General professional training in pediatrics:*

This must fulfil the requirements of the country of registration as a pediatrician and must include at least 3 years of pediatric training and experience in neonatology and intensive care.

### *4.2 Subspecialty training:*

This should further comprise a minimum of 3 years pediatric nephrology training. During the training period a high standard of expertise should be obtained in both inpatient and outpatient environments of:

4.2.1 embryology of the kidney and urinary tract

4.2.2 anatomy, histopathology and physiology of the kidney and its circulation under normal and abnormal conditions

4.2.3 pathology and pathophysiology of congenital and acquired diseases of the kidney and urinary tract in the growing child

4.2.4 etiology, symptomatology, diagnosis and differential diagnosis of congenital, genetic and acquired renal diseases in the foetus, infant and child and their appropriate investigation by imaging, tests of function and histopathology

4.2.5 performance or detailed knowledge of the following procedures:

4.2.5.1 urinalysis and urine microscopy

4.2.5.2 renal biopsy

4.2.5.3 urinary tract ultrasound

4.2.5.4 clearance techniques for the measurement of glomerular filtration rate and the activity of functionally distinct segments of the renal tubule

4.2.5.5 the application of peritoneal dialysis, hemodialysis and related techniques together with peritoneal and vascular access

4.2.5.6 voiding cysto-urethrogram

4.2.6 use of diet and drugs for the treatment of renal diseases

4.2.7 During the training period the trainee should acquire knowledge of the indications and management of surgical interventions in the urinary tract.

4.2.8 A good understanding should also be obtained of the causes of bladder voiding abnormalities, their urodynamic investigation and their medical and surgical treatment.

4.2.9 A good understanding should be obtained of the prevention, manifestations and management of psycho-social problems which arise in children with chronic renal disease and their parents.

4.2.10 Pharmacology in children with renal diseases, especially antibiotic and immunosuppressive agents.

4.2.11 The trainee should be aware of the ethical issues commonly encountered in the practice of pediatric nephrology and research.

4.2.12 The trainee should be aware of the principles of Evidence- Based Medicine : evaluation and application of findings from the clinical research literature and published guidelines for management of pediatric renal disorders.

## **5. REQUIREMENTS FOR INSTITUTIONS OFFERING PEDIATRIC NEPHROLOGY TRAINING**

Higher specialty training in Pediatric Nephrology should be based at established pediatric nephrology units which offer a full range of renal diagnostic facilities plus facilities for the treatment of acute and chronic renal failure. They will usually be part of academic departments of pediatrics in which teaching and research is an integral activity and they will be linked with other pediatric subspecialties.

5.1 Pediatric specialists should be employed within the institution or a linked one in the following specialties: anaesthetics, cardiology, dietetics, endocrinology, histopathology, psychiatry, psychology, radiodiagnosics, pediatric surgery, transplant surgery, (pediatric) urology and social work. Training should be conducted by at least two fully trained pediatric nephrologists in one or more centres.

5.2 Surgery: at the institution, or at a closely linked one, the necessary infrastructure for urological and renal transplant surgery in infants and older children must be present.

5.3 Ancillary services: the institution, or one closely linked to it, must be equipped for imaging of the kidney and urinary tract (radiology, ultrasound, nuclear medicine) and for renal histopathology including electron microscopy and immunofluorescent antibody staining of biopsy material. Internet Access and library with nephrology resources should be available.

5.4 Patient load: At the training institution the number of patients and their care must be of such a standard as to be able to meet the training requirements within the time set.

5.5 The institution should ensure that:

5.5.1 The trainee is spending the major part of his or her time in pediatric nephrology.

5.5.2 The trainee is fully acquainted with the theoretical aspects of pediatric nephrology listed above in related paragraphs.

5.5.3 Whilst undergoing training the trainee performs the procedures listed under 4.2.5 so that they can be performed independently and safely after accreditation.

5.5.4 Discussions concerning patient care are held regularly.

5.5.5 Joint discussions with collaborating specialists e.g. surgeons, histopathologists, are held regularly.

5.5.6 The trainee is involved in the preparation of children and their families for dialysis and renal transplantation.

5.5.7 The trainee has sufficient access to high quality pediatric nephrological literature which is discussed regularly.

5.5.8 All relevant equipment is of sufficiently high quality to allow good training.

5.5.9 The trainee becomes familiar with the psychosocial problems of the patients and their families.

5.5.10 There is appropriate contact with adult nephrologists.

5.5.11 The trainee is given sufficient time and opportunity to undertake research in the field of pediatric nephrology and to present the findings at scientific meetings and publish them in peer-reviewed journals. This should amount to at least 1 half day per week, or the equivalent as a continuous period, away from the clinical service.

## **6. ACCREDITATION**

Accreditation will be granted to trainees who have satisfactorily completed their higher specialty training in pediatric nephrology and undergone a formal assessment. Given the necessary funding we propose that the recognition of training institutions and the assessment of trainees should be conducted by representatives of the European Society for Pediatric Nephrology.

### *Training Programme*

This refers to the practical arrangements for training which enable the trainee to cover the syllabus. The training programme may be arranged as modules carried out in different centres or in different sections within the same centre, to enable the trainee to gain experience in breadth and depth.

### *Training Record*

This refers to a personal log book of the trainees' experience which provides a record of work undertaken, experience, techniques learned and conditions seen, as well as any other comments the trainee wishes to record. It serves to aid the trainee and forms part of the final assessment (accreditation).

### *Accreditation*

At the present time it is recommended (but not mandatory) to include a final examination as part of the training programme or accreditation process. The recognition of pediatric nephrology training should be done according to the national legislation and is advocated by ESPN .

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