Curriculum

FNB Fellowship

Paediatric Nephrology

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I. PROGRAMME GOAL & OBJECTIVES

1. Programme Goal

To provide training for pediatricians who shall provide high quality, clinical care to children with renal diseases

2. Programme Objectives

Learning Objectives

After completing the course, the student should be able to:

a. 2Analyze problems scientifically, taking into account the biological basis and epidemiology of renal diseases in children
b. Provide acute care to patients with renal diseases
c. Recognize surgically treatable conditions
d. Implement a follow-up plan for patients with chronic kidney disease including renal transplantation
e. Seek and analyze new literature in the specialty, and apply it in their work
f. Play a catalytic role in prevention of renal disorders

II. TEACHING AND TRAINING ACTIVITIES

The fundamental components of the teaching programme should include:

1. Case presentations & discussion- once a week
2. Seminar – Once a week
3. Journal club- Once a week
4. Grand round presentation (by rotation departments and subspecialties)- once a week
5. Faculty lecture teaching- once a month
6. Clinical Audit-Once a Month
7. A poster and have one oral presentation at least once during their training period in a recognized conference.

The rounds should include bedside sessions, file rounds & documentation of case history and examination, progress notes, round discussions, investigations and management plan) interesting and difficult case unit discussions.

The training program would focus on knowledge, skills and attitudes (behavior), all essential components of education. It is being divided into theoretical, clinical and practical in all aspects of the delivery of the rehabilitative care, including methodology of research and teaching.

Theoretical: The theoretical knowledge would be imparted to the candidates through discussions, journal clubs, symposia and seminars. The students are exposed to recent advances through discussions in journal clubs. These are considered necessary in view of an inadequate exposure to the subject in the undergraduate curriculum.

Symposia: Trainees would be required to present a minimum of 20 topics based on the curriculum in a period of two years to the combined class of teachers and students. A free discussion would be encouraged in these symposia. The topics of the symposia would be given to the trainees with the dates for presentation.

Clinical: The trainee would be attached to a faculty member to be able to pick up methods of history taking, examination, prescription writing and management in rehabilitation practice.

Bedside: The trainee would work up cases, learn management of cases by discussion with faculty of the department.

Journal Clubs: This would be a weekly academic exercise. A list of suggested Journals is given towards the end of this document. The candidate would summarize and discuss the scientific article critically. A faculty member will suggest the article and moderate the discussion, with participation by other faculty members and resident doctors. The contributions made by the article in furtherance of the scientific knowledge and limitations, if any, will be highlighted.

Research: The student would carry out the research project and write a thesis/ dissertation in accordance with NBE guidelines. He/ she would also be given exposure to partake in the research projects going on in the departments to learn their planning, methodology and execution so as to learn various aspects of research.

III. SYLLABUS

Overview of Curriculum

During the training, satisfactory understanding and expertise should be obtained in both inpatient and outpatient environments of

- Pathophysiology of congenital & acquired diseases of the kidney and urinary tract in the growing child
- Etiology, clinical features, diagnosis and differential diagnosis of congenital & acquired renal diseases in the fetus, infant and child, their evaluation and management
- Performance/knowledge of Renal biopsy, interpretation of renal histology
- Renal ultrasound
- Techniques for the assessment of glomerular and tubular function
- Application of acute peritoneal dialysis,CAPD, CCPD, hemodialysis
- Application of CRRT and Plasma Exchange is desirable
- Use of diet and drugs for the treatment of renal diseases
- Understanding the management of surgical conditions of the urinary tract
- Understanding Bladder Disfunction and Urodynamics

Curriculum Content

Imaging

Knowledge	• To understand the role, limitations and interpretation of commonly used imaging modalities • To know the practicalities and safety precautions associated with each test
Skills	• To request the different radiological investigations • To be able to interpret scan images

Renal Physiology

Skills, Knowledge	• To appropriately request & interpret investigations for assessment of a. GFR from height and plasma creatinine b. Calcium, phosphate & bone mineral metabolism c. Urinary concentrating and diluting ability d. Tubular handling of fluid and electrolytes e. Acid-base balance • To understand the practicalities, limitations and precautions for measurement of: a. Creatinine clearance b. Protein and calcium excretion c. Tubular handling d. Tests for urinary acidification

Renal Biopsy

Knowledge	• To know the indications, procedure and complications
Skills	• To perform a kidney biopsy safely • To recognize common histological appearances and consequences for diagnosis, prognosis and treatment

Urinary tract infection (UTI) and vesicoureteric reflux

Knowledge	• To understand the epidemiology, clinical features and issues in diagnosis • Role of imaging, other investigations and therapy • To understand the options/management of UTI & VUR
Skills	• To perform an MCU

Structural malformations

Knowledge	• To know the presentations of developmental variants and abnormalities, including obstruction • To be aware of different reconstructive procedures
Skills	• To be able to provide medical support to urological services

Disorders of micturition & neuropathic bladder

Knowledge	• To know the common renal and non-renal diagnoses associated with enuresis • Understand the appropriate use of urodynamic studies and instigate management strategies
Skills	• To appropriately assess a child with bladder dysfunction • To interpret Urodynamic studies

Hematuria

Knowledge	• To understand the pathophysiology and etiology of macroscopic and microscopic hematuria
Skills	• To be able to perform urinalysis • To demonstrate appropriate investigation and management of the child with hematuria, including role of imaging, urological assessment, renal biopsy and genetic and molecular studies

Proteinuria

Knowledge	• To know and differentiate between physiological and pathological causes of proteinuria • To know the methods of investigation, indications for biopsy; and management of a child with proteinuria

Glomerular disease

Knowledge	• To know the etiology and immunological basis of glomerulonephritis • To know the different forms of presentation and their appropriate management • To understand the clinical course and prognosis of acute and chronic glomerulonephritis • To know the indications for immunosuppressive agents, cytotoxic drugs, plasmapheresis and dialysis

Nephrotic syndrome

Knowledge	• To know the pathophysiology of nephrotic syndrome • To understand the investigation of nephrotic syndrome including indications for renal biopsy • To know the pharmacology and side-effects of steroids, other immunosuppressive agents and other agents
Skills	• To detect and manage associated complications • To manage the initial presentation of nephrotic syndrome • To manage steroid-sensitive, steroid-dependent & steroid-resistant nephrotic syndrome, including indications and choice of treatment • To be able to manage congenital nephrotic syndrome

Systemic lupus erythematosus

Knowledge	• To understand the classification, clinical course and treatment options in lupus nephritis
Skills	• To perform clinical examination, plan and interpret investigations, including histology & immunology

Vasculitides

Knowledge	• To know the causes, presentation, patterns of multisystem involvement and spectrum of disease • To describe the investigation and monitoring of the patient with vasculitis • To list the different therapeutic options available, including adverse effects
Skills	• To be able to appropriately investigate and treat vasculitis, including use of immunosuppression

Hemolytic uremic syndrome

Knowledge	• To understand its pathophysiology & epidemiology • To know the presentation and clinical course of diarrhea-positive and atypical HUS

	• To understand principles of treatment, role of plasma exchange and dialysis, and long-term management including implications for transplantation
Skills	• To be able to investigate, diagnose and manage the initial presentation of HUS

Interstitial nephritis

Knowledge	To list causes of interstitial nephritis/ tubulointerstitial disease
Skills	To appropriately investigate and manage the child with interstitial nephritis, including use of corticosteroids

Hypertension

Knowledge	• To define & understand the diagnosis of hypertension; know the common conditions in different age groups • To describe the possible mechanisms causing essential and secondary hypertension • To describe the investigations in these cases • To describe the mechanism of action and side-effects of anti-hypertensive agents
Skills	• To be able to investigate a child with hypertension • To be competent in management of hypertensive emergencies • To be competent in the management of chronic hypertension, and in using various drugs • To interpret Ambulatory Blood Pressure monitoring

Nephrolithiasis

Knowledge	• To know the etiology of renal stone formation, including underlying tubular abnormalities • To know the biochemical and radiological investigations • To understand the medical (including prevention of stones) and surgical management
Skills	• To demonstrate ability to appropriately investigate the child with renal stones • To manage the child with renal stones

Tubular disorders

Knowledge	• To understand the causes and different presentations of primary and secondary tubular disorders • To understand the investigation of tubulopathies
Skills	• To be competent in the investigation and management of tubular disorders

Cystic disease

Knowledge	• To list the different causes of renal cystic disease in different age groups • To describe the mode of inheritance and methods of screening, including for multicystic dysplasia • To know the clinical course of polycystic kidney disease, nephronophthisis
Skills	• To examine and investigate the child with renal cysts in different age groups • To manage a child with cystic kidney disease

Genetic disorders

Knowledge	• To know the presentation and management of common inherited renal disease including renal involvement in syndromes, familial nephritis and cystic kidney disease • To understand basic genetic principles
Skills	• To be able to advise parents of the risk of recurrence and the need for family screening

Fluid and electrolyte disturbances

Knowledge	• To understand the physiology of fluid and electrolyte imbalance • To know the principles of treatment of fluid and electrolyte imbalance • To know the endocrine diseases associated with imbalance
Skills	To be able to manage fluid and electrolyte imbalances in non-renal disease including overdose

Acute kidney injury

Knowledge	• To know the differential diagnosis of AKI • To know the investigation including role of biopsy • To describe the methods to correct fluid/biochemical abnormalities and indications for dialysis • To know the treatment of reversible causes of AKI
Skills	• To perform a reliable and accurate clinical assessment of the patient's fluid status • To be able to appropriately manage the complications of AKI – conservative and dialysis • To be able to select and practically manage the different dialysis modalities including peritoneal dialysis, hemodialysis and hemofiltration • To be able to begin treatment of the underlying cause • To manage the patient with multiorgan failure or systemic disease requiring renal replacement therapy

Chronic kidney disease (CKD); chronic renal failure (CRF)

Knowledge	• To know the epidemiology, causes of CKD • To know the investigations required in a child with new presentation, including assessment of the degree of renal failure and reversibility of the condition • To understand the natural history and prognosis of common diseases causing CKD, and treatment strategies that may ameliorate the condition • To understand factors involved in failure to thrive • To describe the pathophysiology, investigation and indications for treatment in mineral bone disease • To describe the pathophysiology of renal anemia, its investigation and appropriate management
Skills	• To identify/appropriately manage the underlying cause • To diagnose and treat the child with CKD including biochemical disturbance, bone disease and anemia

	• To appropriately counsel the family to facilitate the selection of dialysis modality and prior to referral for renal transplantation • To make an accurate assessment of nutritional status & use appropriate advice with the assistance of dietitians • To show ability to prevent, diagnose and manage mineral bone disease

(T) Transplantation

Knowledge	*Pre-Transplantation* • To understand the ethical issues surrounding organ donation/ transplant; principles of recipient selection, indications and contraindications • To know what is involved in a transplant work- up *Transplantation* • To know the basic surgical procedures involved • To know the medications used, including side- effects *Post-Transplantation* • To know the indications for renal transplant biopsy • To understand the immune mechanisms of rejection, know the recurrence rate of disease & complications
Skills	*Pre-transplantation* • To assess the suitability of a patient, discuss issues of transplantation *Post-transplantation* • To be able to manage the stable transplant patient • To be able to advise the child, family and school

DIALYSIS

Hemodialysis

Knowledge	• To describe the principles of hemodialysis & compare & contrast with other methods • To describe the methods of vascular access, and their complications • To list the complications occurring during dialysis

Skills	• To be able to plan the initiation of hemodialysis • To manage different forms of vascular access • To adjust the prescription, manage the complications of hemodialysis

Peritoneal Dialysis

Knowledge	• To describe the principles of acute and chronic dialysis, & the advantages/disadvantages compared to hemodialysis • To know the complications of peritoneal dialysis, both infective and mechanical
Skills	• To be able to prescribe/monitor patients on dialysis • To manage the complications of peritoneal dialysis

Pharmacology

Knowledge	• To define principles of pharmacokinetics and drug handling in renal impairment • To list ways in which different classes of drugs act on the nephron and affect renal function • To list the effects of hemodialysis, hemofiltration and peritoneal dialysis on drug prescribing • To describe principles of drug interactions, especially immunosuppressive agents
Skills	• To prescribe safely to patients with renal disease

Other areas in which knowledge is to be acquired:

- Biostatistics, Research Methodology and Clinical Epidemiology
- Ethics
- Medico legal aspects relevant to the discipline
- Health Policy issues as may be applicable to the discipline

IV. COMPETENCIES

A high standard of expertise should be obtained in performance of the following procedures:

- Urine collection including suprapubic aspiration, Urinalysis
- Renal biopsy and interpretation of histology
- Tests for assessment of glomerular and tubular functions
- Insertion of bedside Tenchkoff catheter and Venous Catheters for Dialysis
- Application of peritoneal dialysis, hemodialysis and related techniques
- Use of diet and drugs for the treatment of renal diseases
- Communication with patients

V. LOG BOOK

A candidate shall maintain a log book of operations (assisted / performed) during the training period, certified by the concerned post graduate teacher / Head of the department / senior consultant.

This log book shall be made available to the board of examiners for their perusal at the time of the final examination.

The log book should show evidence that the before mentioned subjects were covered (with dates and the name of teacher(s) The candidate will maintain the record of all academic activities undertaken by him/her in log book.

1. Personal profile of the candidate
2. Educational qualification/Professional data
3. Record of case histories
4. Procedures learnt
5. Record of case Demonstration/Presentations
6. Every candidate, at the time of practical examination, will be required to produce performance record (log book) containing details of the work done by him/her during the entire period of training as per requirements of the log book. It should be duly certified by the supervisor as work done by the candidate and countersigned by the administrative Head of the Institution.
7. In the absence of production of log book, the result will not be declared.

आयुर्विज्ञान में राष्ट्रीय परीक्षा बोर्ड

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