



**FACULTY OF
PAEDIATRICS**

ROYAL COLLEGE OF
PHYSICIANS OF IRELAND

ICFP Fellowship

PAEDIATRIC NEPHROLOGY



This ICFP curriculum of training in Paediatric Nephrology was developed and reviewed in 2022 by Dr Clodagh Sweeney Consultant Nephrologist, and Dr Michael Riordan, Consultant Paediatric Nephrologist. It is approved by the Specialist Training Committee in General Paediatrics and Dr Ann O’Shaughnessy, Head of Education. The fellowship is approved by the Faculty of Paediatrics.

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Introduction

The International Clinical Fellowship Programme (ICFP) provides a route for overseas doctors wishing to undergo structured and advanced postgraduate medical training in Ireland. The ICFP enables suitably qualified overseas postgraduate medical trainees to undertake a fixed period of active training in clinical services in Ireland.

The purpose of the ICFP is to enable overseas trainees to gain access to structured training and in active clinical environments that they cannot get in their own country, with a view to enhancing and improving the individual's medical training and learning and, in the medium to long term, the health services in their own countries.

This Programme will allow participants to access a structured period of training and experience as developed by the Royal College of Physicians of Ireland to specifically meet the clinical needs of participants as defined by their home country's health service.

Aims

The Fellowship in Clinical Paediatric Metabolic Medicine provides a structured certifiable educational experience designed to deliver the requirements of Clinical Paediatric Metabolic Medicine which are not readily available within the specialist training programme. The National Centre for Inherited Metabolic Disorders (NCIMD) based at CHI Temple Street with RCPI is delighted to offer this training experience designed primarily for paediatricians who wish to gain further expertise in inherited metabolic disorders. NCIMD is the national referral centre for all children with inherited metabolic disorders and CHI Temple Street is the national centre for newborn bloodspot screening and also hosts the metabolic biochemical laboratory.

Upon satisfactory completion of the ICFP, the doctor will be **competent** to undertake comprehensive medical practice in their chosen specialty in a **professional** manner, in keeping with the needs of the healthcare system.

Competencies, at a level consistent with practice in the specialty, will include the following:

- Patient care that is appropriate, effective and compassionate dealing with health problems and health promotion.
- Medical knowledge in the basic biomedical, behavioural and clinical sciences, medical ethics and medical jurisprudence and application of such knowledge in patient care.
- Interpersonal and communication skills that ensure effective information exchange with individual patients and their families and teamwork with other health professionals, the scientific community and the public.
- Appraisal and utilisation of new scientific knowledge to update and continuously improve clinical practice.
- Capability to be a scholar, contributing to development and research in the field of the chosen specialty.
- Professionalism.
- Ability to understand health care and identify and carry out system-based improvement of care.

Professionalism

Medical professionalism is a core element of being a good doctor. Good medical practice is based on a relationship of trust between profession and society, in which doctors are expected to meet the highest standards of professional practice and behaviour. It involves partnership between patient and doctor that is based on mutual respect, confidentiality, honesty, responsibility and accountability. In addition to maintaining clinical competence, a doctor should also:

- Show integrity, compassion and concern for others in day-to-day practice
- Develop and maintain a sensitive and understanding attitude with patients
- Exercise good judgement and communicate sound clinical advice to patients
- Search for the best evidence to guide professional practice
- Be committed to continuous improvement and excellence in the provision of health care whether working alone or as part of a team

Prior to commencing their sponsored clinical placements, all participants will also be required to undergo the mandatory screening requirements of the relevant clinical site/service including occupational health assessment and Garda/Police clearance.

Training Programme Duration & Organisation of Training

The period of clinical training that will be provided under the International Clinical Fellowship Programme (ICFP) for medical specialities is up to 3 years, after which the overseas doctors will be required to return to their country of origin.

- Each ICFP is developed by the Royal College of Physicians of Ireland will be specifically designed so as to meet the training needs of participants to support the health service in their home country.
- All appointees to the ICFP will be assessed by the Royal College of Physicians of Ireland to ensure that they possess the necessary requirements from a training and clinical service perspective.
- Each overseas doctor participating in the ICFP will be enrolled with the Royal College of Physicians of Ireland and will be under the supervision of a consultant doctor who is registered on the Specialist Division of the Register of Medical Practitioners maintained by the Medical Council and who is an approved consultant trainer.
- Appointees to the ICFP will normally be registered on the Supervised Division of the Register of Medical Practitioners maintained by the Medical Council in Ireland.
- Appointees will agree a training plan with their trainers at the beginning of each training year.
- For the duration of their International Medical Graduate (IMG) programme and associated clinical placements, all participants will remain directly employed and directly paid by their sponsoring state at a rate appropriate to their training level in Ireland and benchmarked against the salary scales applicable to NCHD's in Ireland;
- Successful completion of an ICFP will result in the participant being issued with a formal Certificate of completion for the Fellowship Programme by the Royal College of Physicians of Ireland. This Certificate will enable the participant's parent training body in their sponsoring home country to formally recognise and accredit their time spent training in Ireland.

The training programme offered will provide opportunities to fulfil all the requirements of the curriculum of training. There will be posts in both general hospitals and teaching hospitals.

Each post within the programme will have a named trainer/educational supervisor and programmes will be under the direction of the National Specialist Director of the relevant medical speciality to be confirmed by the College. Programmes will be as flexible as possible consistent with curricular requirements, for example to allow the trainee to develop their sub-specialty interest.

ePortfolio logbook

Each trainee is responsible for maintaining an up-to-date record of progress through training and compiling a portfolio of achievements for presentation at each annual assessment review. The trainee also has a duty to maximise opportunities to learn, supplementing the training offered with additional self-directed learning in order to fulfil all the educational goals of the curriculum.

Up-to-date training records and an ePortfolio of achievements will be maintained by the trainee throughout. The training records will be countersigned as appropriate by the trainers to confirm the satisfactory fulfilment of the required training experience and the acquisition of the competencies set out in the training plan. They will remain the property of the trainee and must be produced at their annual assessment review.

Trainees must co-operate with the College in completing their training plan.

It is in a trainee's own interest to maintain contact with the Royal College of Physicians of Ireland, and to respond promptly to all correspondence relating to training. At review, your ePortfolio will be examined.

Review

A consultant trainer/educational supervisor will be identified for each participant in the programme. He/she will be responsible for ensuring that the educational potential of the post is translated into effective training which is being fully utilized. Only departments approved for Training by the Royal College of Physicians of Ireland and its constituent training bodies will be used.

The training objectives to be secured should be agreed between each trainee and trainer at the commencement of each posting in the form of a written training plan. The trainer will be available throughout, as necessary, to supervise the training process. In each year trainees undergo a formal review by an appropriate panel. The panel will review in detail the training record, will explore with the trainee the range of experience and depth of understanding which has been achieved and consider individual trainer's reports. An opportunity is also given to the trainee to comment on the training being provided; identifying in confidence any deficiencies in relation to a particular post.

A quarterly and annual review of progress through training will be undertaken on behalf of the International Clinical Fellowship Programme (ICFP). These will include assessments and reports by educational supervisors, confirmation of achievements and the contents of the ePortfolio will be reviewed. At some or all of these annual reviews a non-specialty assessor will be present capable of addressing core competencies.

The award of a Certificate of completion will be determined by a satisfactory outcome after completion of the entire series of assessments.

Core Professional Skills

Partnership

Communication and interpersonal skills

- Facilitate the exchange of information, be considerate of the interpersonal and group dynamics, have a respectful and honest approach.
- Engage with patients and colleagues in a respectful manner
- Actively listen to the thoughts, concerns and opinions of others
- Consider data protection, duty of care and appropriate modes of communication when exchanging information with others

Collaboration

- Collaborate with patients, their families and your colleagues to work in the best interest of the patient, for improved services and to create a positive working environment.
- Work cooperatively with colleagues and team members to deliver an excellent standard of care
- Seek to build trust and mutual respect with patients
- Appropriately share knowledge and information, in compliance with GDPR guidelines
- Take on-board available, relevant feedback

Health Promotion

- Communicate and facilitate discussion around the effect of lifestyle factors on health and promote the ethical practice of evidence based medicine.
- Seek up to date evidence on lifestyle factors that:
 - negatively impact health outcomes
 - increase risk of illness
 - positively impact health and decrease risk factors
- Actively promote good health practices with patients individually and collectively

Caring for patients

- Take into consideration patient's individuality, personal preferences, goals and the need to provide compassionate and dignified care.
- Be familiar with
 - Ethical guidelines
 - Local and national clinical care guidelines
- Act in the patients best interest
- Engage in shared decision making and discuss consent

Performance

Patient safety and ethical practice

- Put the interest of the patient first in decisions and actions.
- React in a timely manner to issues identified that may negatively impact the patients outcome
- Follow safe working practices that impact patients safety
- Understand ethical practice and the medical council guidelines
- Support a culture of open disclosure and risk reporting
- Be aware of the risk of abuse, social, physical, financial and otherwise, of vulnerable persons

Organisational behaviour and leadership

- The activities, personnel and resources that impact the functioning of the team, hospital and health care system.
- Understand and work within management systems
- Know the impacts of resources and necessary management
- Demonstrate proficient self-management

Wellbeing

- Be responsible for own well-being and health and its potential impact on the provision of clinical care and patient outcomes.
- Be aware of signs of poor health and well-being
- Be cognisant of the risk to patient safety related to poor health and well-being of self and colleagues
- Manage and sustain your own physical and mental well-being

Practice

Continuing competence and lifelong learning

- Continually seek to learn, to improve clinical skills and to understand established and emerging theories in the practice of medicine.
- Meet career requirements including those of the medical council, your employer and your training body
- Be able to identify and optimise teaching opportunities in the workplace and other professional environments
- Develop and deliver teaching using appropriate methods for the environment and target audience

Reflective practice and self-awareness

- Bring awareness to your actions and decisions and engage in critical appraisal of own work to drive lifelong learning and improve practice.
- Pay critical attention to the practical values and theories which inform every day practice
- Be aware of your own level of practice and your learning needs
- Evaluate and appraise your decisions and actions with consideration as to what you would change in the future
- Seek to role model good professional practice within the health service

Quality assurance and improvement

- Seek opportunities to promote excellence and improvements in clinical care through the audit of practice, active engagement in and the application of clinical research and the dissemination of knowledge at all levels and across teams.
- Gain knowledge of quality improvement methodology
- Follow best practice in patient safety
- Conduct ethical and reproducible research

Specialty Section

1. Inpatient Ward

Objectives: On the nephrology ward, the Fellow will provide care for patients admitted under the Nephrology Service, with supervision by the Consultant Nephrologist. The patient population is diverse, with emphasis on patients with chronic renal failure, end stage renal disease on dialysis, and post transplantation.

Multidisciplinary ward rounds occur weekly on Monday afternoon (Temple Street) and Tuesday afternoon (Crumlin). Psychosocial rounds are on Monday morning. Radiology/Nephrology rounds occur each Monday lunchtime. The NCHDs on the team are responsible for generating the list of patients for discussion for submission to Radiology.

General

KNOWLEDGE

- Be proficient in the management of children with Nephrotic syndrome
- Be proficient in the management of children with Acute Glomerulonephritis
- Be proficient in the investigation and management of children with hypertension, including: (see also outpatient rotation)
 - Diagnosing and investigating hypertension Emergency treatment of severe hypertension
 - Use of antihypertensive agents, and knowing their effects, side-effects, dosing, and indications
- Be proficient in the fluid and electrolyte management of children with polyuric renal disease, including nephrogenic diabetes insipidus, and nephrogenic defects in concentration, both with, and without intercurrent illness
- Be proficient in the management of children with tubulopathies (e.g.: renal Fanconi syndrome) including knowing the etiology, diagnosis, prognosis and treatment
- Be proficient in the post-surgical management of children with chronic renal failure.
- Be proficient in the management of children with chronic renal failure and intercurrent illness.
- Be proficient in the management of pyelonephritis with renal dysfunction.
- Be proficient in the diagnosis and treatment of urinary tract infections in patients with abnormal urinary tract anatomy.

SKILLS

- Be proficient in history-taking and physical examination of the patient with renal disease
- Be proficient in the comprehensive care of the nephrology patient, including formulation of a diagnosis and differential diagnosis, plan of investigation, plan of treatment, and long-term follow-up
- Use appropriate judgment and decision-making skills
- Recognize emergency situations, and appropriate management strategies for common nephrology emergencies
 - E.g.: hyperkalemia, severe hypertension, diuretic unresponsive pulmonary edema
- Have an awareness of the medico-legal responsibilities of a physician including accurate record-keeping

Renal Biopsy

KNOWLEDGE

- Know the indications for renal biopsy (closed and open) in the pediatric population
- Know the risks of and procedure for biopsy of a solitary kidney Know the preparation of a patient for a renal biopsy
- Know the complications of biopsy and management of post-biopsy complications.
- Know post-renal biopsy management.

SKILLS

- Plan an appropriate course of treatment and/or follow-up based on the renal biopsy results (Clinico-pathological correlation)

Growth and Development

KNOWLEDGE

- Demonstrate an understanding of the normal growth, development, and pubertal staging of children
- Demonstrate an understanding of the impact of renal disease on growth and development

SKILLS

- Be proficient in treatment of growth delay in children with chronic kidney disease

Elevated serum creatinine (acute or chronic)

KNOWLEDGE

Demonstrate knowledge of:

- Pathophysiology of renal dysfunction
- differential diagnosis
- diagnostic tests
- management (including dialysis)

SKILLS

- Demonstrate an appropriate approach to the patient with an elevated creatinine

Chronic Kidney Disease (CKD)

KNOWLEDGE

- Know the etiologies of CKD
- Know the staging of chronic kidney disease Know the means of preservation of renal function
Appropriately monitor the patient with CKD

SKILLS

Know the complications of CKD, and their management, including:

- anemia
- metabolic bone disease
- acidosis/electrolyte disorders
- hypertension
- growth impairment
- cardiovascular disease/hyperlipidemia

Fluid & Electrolyte Disorders

KNOWLEDGE & SKILLS

Know the etiology, diagnosis and management of common fluid and electrolyte disorders, including:

- hyponatremia/hyponatremia
- hypokalemia/hyperkalemia
- hypocalcemia/hypercalcemia
- hypophosphatemia/hyperphosphatemia
- magnesium disorders
- metabolic acidosis
- metabolic alkalosis

Transplantation

KNOWLEDGE

- Know the usual surgical management of pediatric renal transplant recipients
- Know transplant immunology, including:
 - Cross-match procedure and significance
 - Importance of HLA sensitization in the interpretation of cross match results
 - Immune response to the allograft
- Know the etiology, pathogenesis, diagnosis and management of acute complications of transplant, including:
 - delayed graft function lymphocele
 - ureteric stricture vascular thrombosis rejection
 - urine leaks
 - urinary tract infection
 - viral infection (CMV, EBV, polyoma virus, other viruses)
 - hypertension
- Know the options for treatment of graft dysfunction including that caused by rejection, viral infection, denovo disease, disease recurrence etc.

- Know the use and interpretation of therapeutic drug monitoring of immunosuppressant medications, including an understanding of the concept of “target levels”, and the ability to modify drug dosage based on the results.
- Know the pharmacology of the common immunosuppressive drugs, including method of action, side effects, dosage, and indications for use of each (e.g.: induction, maintenance, or rejection treatment) including :
 - Steroids
 - MMF/Myfortic
 - Azathioprine
 - Cyclosporine
 - Tacrolimus
 - Rapamycin
 - polyclonal
 - anti-lymphocyte products
 - anti-CD25 antibodies
 - new agents as they become available
- Know the indications for, and complications of, renal biopsy in the transplant population (see also renal biopsy).
- Know transplant pathology, including:
 - acute rejection (cellular, humoral and vascular)
 - chronic allograft nephropathy
 - recurrence of original disease
 - occurrence of de novo renal disease
 - viral infection
 - drug toxicity
- Know the etiology, diagnosis and management of long-term complications of transplant including:
 - chronic allograft
 - nephropathy
 - opportunistic infections
 - hypertension
 - malignancy (skin cancer, lymphoproliferative disease)
 - recurrent renal disease
 - non-adherence
 - graft failure
 - obesity
 - hyperlipidemia
 - cardiovascular disease
 - medication toxicity
 - glucose intolerance
 - metabolic bone disease (including osteoporosis)

SKILLS

- Be proficient in the allocation of deceased donor kidneys, including:
 - interpretation of tissue typing and cross match results

- application of an allocation algorithm
- Be proficient in the post-operative management of pediatric renal transplant recipients, including knowledge of:
 - the usual surgical and medical complications
 - psychosocial problems encountered in the early post-transplant period
 - the implications of delayed graft function
- Use an organized approach to the diagnosis of early and late graft dysfunction, including:
 - differential diagnosis of graft dysfunction
 - investigations for graft dysfunction
 - interpretation of the results of investigations
 - indications for renal biopsy

Dialysis (general)

KNOWLEDGE

- Know of the indications for acute and chronic dialysis in the pediatric population (including intoxications), as well as the pros and cons of the available dialysis modalities.

SKILLS

- Assist patients and families in their choice of dialysis modality.

Peritoneal Dialysis (PD)

- Prepare children with acute and chronic renal failure for insertion of a peritoneal dialysis catheter.
- Manage PD patients admitted to hospital both for complications of PD (e.g.: hernias, peritonitis, volume overload) and for unrelated illnesses (e.g.: Surgical procedures, gastroenteritis)

Haemodialysis (HD)

- Prepare patients with acute and chronic renal failure for insertion of a central venous line or vascular access for haemodialysis
- Initiate haemodialysis, with attention to and knowledge of the acute complications of initial dialysis in the severely uremic patient
- Manage haemodialysis patients admitted to hospital, both for complications of their chronic HD (e.g. CVL sepsis or CVL malfunction) and for illnesses unrelated to their chronic HD (e.g. Elective or urgent surgery)

Drug dosing in renal disease

KNOWLEDGE

- Know the pathophysiology of altered drug metabolism in renal disease
- Demonstrate a working knowledge of drug nephrotoxicity
- Demonstrate a working knowledge of which drug classes require adjustment for reduced levels of renal function

SKILLS

- Be proficient in drug dosing for varying degrees of renal failure

ASSESSMENT & LEARNING METHODS

These goals and objectives will be attained through participation in the daily care of patients with the supervision of the responsible Consultant; through self-directed learning; didactic teaching sessions and by attendance at National and International Conferences.

Achievement of these objectives will be evaluated by direct observation of the Fellow's behaviour, knowledge and skills during each rotation, as well as through input from allied Health Professionals.

2. Hemodialysis and Peritoneal Dialysis

Objectives: Upon completion of the training program, the Fellow should have acquired the knowledge, skills and attitudes required to independently care for patients with end-stage renal disease (ESRD) requiring haemodialysis (HD) and home peritoneal dialysis (PD). The Resident should also have acquired a working knowledge of therapeutic apheresis.

The Fellow will undertake responsibility for the care of patients on HD and PD, during the patients' attendance for HD sessions, or outpatient PD/home HD clinics, and while at home, with guidance from the supervising Consultant, and with the assistance of allied health care professionals. The Fellow will investigate and manage clinical issues and complications of ESRD and dialysis as they arise, will liaise with the supervising consultant to make changes to the dialysis prescription in line with clinical status, radiological and laboratory results.

General

KNOWLEDGE

- Be proficient in the assessment of patients with ESRD, including performance of a relevant history and physical exam, with particular attention to volume status and edema.
- Understand the appropriate use of the available dialysis modalities (PD and HD) and with consideration of risks and benefits for each.
- Demonstrate an understanding of how ESRD and dialysis affect the normal growth and development of the child.
- Know the ethical issues involved in the initiation and withdrawal of dialysis in children.

SKILLS

- Integrate clinical and laboratory data to generate a plan of treatment.
- Use appropriate drug dosing in renal disease, including dose modifications for varying degrees of renal impairment, and dosing modifications for haemodialysis and peritoneal dialysis.
- Assist patients and families in their choice of dialysis modality.
- Be proficient in the management of the common complications of ESRD, including:
 - Anemia
 - Renal osteodystrophy
 - Metabolic acidosis
 - Hypertension
 - Growth failure
 - Nutrition
 - Cardiovascular disease (inc hyperlipidemia)
- Recognize the potential complications of ESRD patients, and treat appropriately, including:
 - Bleeding
 - Sleep disorders Serositis Depression
 - Movement disorders e.g.: restless legs Pruritus
- Manage the psychosocial impact of dialysis on the patient and his/her family.

Haemodialysis

KNOWLEDGE

- Know the principles of haemodialysis/haemofiltration, including:
 - Teoretical knowledge of the use of diffusion, convection and adsorption in extracorporeal blood purification
 - Components of the extracorporeal circuit, including dialyzers and tubing
 - Appropriate circuit composition/volume for children of varying sizes
 - Types and merits of available dialysis membranes
 - Water treatment and supply
 - Anticoagulation
 - Dialysate composition
 - Principles of dialysis machine function pertaining to ultrafiltration, and solute clearance, including UF profiling, sodium ramping and blood volume monitoring.
 - Principles of dialyzer reuse
- Know haemodialysis access, including:
 - Types of access (CVL, AV fistula, graft) and access location
 - Appropriate access for patient size
 - Access complications (infection, clotting, malposition etc)
 - Methods and risks/benefits of access monitoring
- Know the acute and chronic complications of haemodialysis, and their etiology, pathophysiology, differential diagnosis, investigation, treatment and prevention, including:
 - hypotension
 - hypertension
 - dialyzer reactions
 - disequilibrium fever
 - arrhythmias
 - embolism (air embolism, clots)
 - cramps
 - haemolysis
 - amyloidosis
- Know the methods for establishing dose of dialysis delivered (Kt/V, URR), the target values for “adequacy” of dialysis, and the pitfalls of these measurements.

SKILLS

- Be proficient in writing and modifying a dialysis prescription, including all the appropriate components of the prescription.

Apheresis

KNOWLEDGE & SKILLS

- Know therapeutic apheresis including:
 - access requirements
 - types of procedures (plasmapheresis, leucopheresis etc)
 - principles of apheresis
 - indications for apheresis
 - components of an apheresis prescription
 - Complications including:alkalosis, hypocalcemia, hypomagnesemia, emboli

Peritoneal Dialysis

KNOWLEDGE

- Know the principles and components of peritoneal dialysis, including:
 - peritoneal
 - membrane physiology
 - connectology (tubing and catheters)
 - PD solution constituents and function
- Know the components of a PD prescription.
- Know the modalities of PD (CAPD, CCPD, NIPD, Tidal)
- Know the functional capabilities of PD cyclers.
- Know the methods for establishing dose of dialysis delivered (Kt/V, creatinine clearance), the target values for “adequacy” of dialysis, and the pitfalls of these measurements.
- Know the Peritoneal Equilibration test, including correct performance of a PET, interpretation of results, and the impact of peritoneal kinetics on an individual’s dialysis prescription.
- Know the procedure for chronic PD catheter insertion, including:
 - Contraindications to PD catheter insertion
 - Pre-operative preparation (including patient selection, site determination, pre-operative antibiotics)
 - Types of PD catheters, and merits of each
 - Methods of insertion (percutaneous, laparoscopic, open)
 - Risks and benefits of omentectomy
 - Complications of catheter insertion
 - Post-operative management (analgesia, exit site care, immediate vs. delayed use)
- Know the etiology, differential diagnosis, prevention and treatment of infectious and non-infectious PD complications, including:
 - Catheter site infections: exit-site and tunnel
 - Peritonitis
 - Fluid leaks

- Hernias
- Haemoperitoneum
- Metabolic problems eg: hypoalbuminemia, hyperlipidemia, hyperglycemia
- Peritoneal sclerosis
- Ultrafiltration failure

SKILLS

- Have experience, under supervision, of writing and modifying PD prescriptions in response to the patient's clinical status and life circumstances, and to optimize dialysis delivery and fluid removal.

ASSESSMENT & LEARNING METHODS

These goals and objectives will be attained by the Fellow through participation in the daily care of patients with the supervision of the responsible consultant, through self-directed learning, didactic teaching sessions and attendance at national and international conferences.

Achievement of these objectives will be evaluated by direct observation of the Fellow's behaviour, knowledge and skills during the rotation.

3. Renal Transplant

Objectives: Upon completion of the training period, the Fellow should have acquired the knowledge, skills and attitudes required to undertake the independent long-term care of children with a renal transplant. Exposure to renal transplant recipients occurs in two settings, namely the inpatient Ward and the outpatient Transplant Clinic with overlap between the two.

The Fellow, with guidance from the attending Staff Nephrologist will investigate and manage clinic issues and complications as they arise. Under Consultant guidance, they will modify the patients' treatment regimens and medications, including immunosuppressant drugs, in response to the patients' clinical status, and laboratory and radiological investigations. They will interact with all allied health care professionals in the MDT.

The Fellow will attend the weekly Transplant clinic, and multidisciplinary "bloods" meeting, and will provide care to transplant patients requiring elective or urgent clinic visits. The Fellow will provide care for renal transplant patients attending the Emergency Department. The Fellow will work with the multidisciplinary team to review outpatient laboratory and radiology investigations, and to adjust treatment as required.

General

KNOWLEDGE

- Know drug dosing in renal disease, including dose modifications for varying degrees of renal impairment, and drug interactions with immunosuppressant medications.
- Know the management of the failing renal transplant, including indications for initiation of dialysis and transplant nephrectomy
- Know the live donor assessment procedure, including:
 - investigations to assess suitability
 - risks to living donation
 - contraindications to living donor donation
- Know the deceased donor assessment procedure, including contraindications to donation.
- Know the bioethical principles involved in organ donation.
- Know transplant immunology, including:
 - cross-match procedure and significance
 - PRA test procedure and significance immune response to the allograft
- Know the ethical issues involved in transplant organ allocation, and renal transplantation in children
- Know the etiology, pathogenesis, diagnosis and management of acute complications of transplant, including:
 - delayed graft function
 - lymphocele
 - ureteric stricture
 - vascular thrombosis rejection
 - urine leaks
 - urinary tract infection
 - viral infection (CMV, EBV, polyoma virus, other viruses)
 - non-adherence
- Know the pharmacology of the common immunosuppressive drugs, including method of action, side effects, dosage, drug interactions and indications for use (e.g.: induction, maintenance, rejection treatment) of each including:
 - Steroids
 - MMF
 - Azathioprine
 - Cyclosporine
 - Tacrolimus
 - Rapamycin
 - Polyclonal anti-lymphocyte products
 - Anti-CD25 antibodies
 - New agents as they become available
- Know the indications for, and complications of, renal biopsy in the transplant population.
- Know transplant pathology including:
 - acute rejection (cellular, humoral and vascular)
 - chronic allograft
 - nephropathy
 - recurrence of original disease
 - occurrence of de novo renal disease
 - viral infection
 - drug toxicity

- Know the etiology, diagnosis and management of long-term complications of transplant including:
 - chronic allograft
 - nephropathy
 - opportunistic infections
 - malignancy (skin cancer, lymphoproliferative disease)
 - recurrent renal disease
 - non-adherence
 - graft failure
 - obesity
 - hyperlipidemia
 - cardiovascular disease
 - medication toxicity
 - glucose intolerance
 - metabolic bone disease (including osteoporosis)
- Know the etiology, investigation and management of hypertension in the renal transplant recipient.

SKILLS

- Be proficient in the assessment of patients with a renal transplant, including performance of a relevant history and physical exam, with particular attention to volume status, edema, hypertension and graft integrity.
- Manage children with chronic kidney disease (CKD) who are approaching the need for renal transplantation, including knowledge of:
 - Contraindications to transplantation
 - Risks of transplantation
 - Benefits of transplantation
 - Investigations to assess suitability for transplantation
 - The need for liaison with Urology regarding any necessary surgical interventions prior to transplantation
- Be proficient in the allocation of deceased donor kidneys, including: interpretation of tissue typing and cross match results understanding and application of an allocation algorithm medical criteria for allocation
- Integrate clinical and laboratory data to generate a plan of treatment
- Be proficient in the management of the common complications of the failing graft
- Appropriately use and interpret therapeutic drug monitoring tests of immunosuppressant medications, including knowing the concept of “target levels”, and modifying drug dosage based on the results.
- Demonstrate an organized approach to the diagnosis of graft dysfunction including:
 - differential diagnosis of graft dysfunction
 - investigations for graft dysfunction
 - interpretation of the results of investigations
 - indications for renal biopsy
- Select appropriate treatment for the management of transplant rejection
- Diagnose and manage the acute and chronic psychosocial problems encountered with renal transplantation.
- Assist in the transition of the adolescent renal transplant recipient to adult services, and the potential impact of transition on patient and graft health.
- Manage the psychosocial impact of renal disease and transplantation on the patient and his/her family.

ASSESSMENT & LEARNING METHODS

These goals and objectives will be attained by the Fellow through participation in the daily care of patients with the supervision of the responsible Consultant Nephrologist, through self-directed learning, didactic teaching sessions, and through attendance at National and International conferences.

Achievement of these objectives will be evaluated by direct observation of the Fellow's behaviour, knowledge and skills at the end of each rotation.

4. Consult Service

Objectives: Consultations are requested from the Division of Nephrology for patients presenting with a wide spectrum of problems, spanning virtually all specialties. The Fellow provides Nephrology Consults for the entire hospital, including the Critical Care Unit, Neonatal Intensive Care Unit, Inpatient Medical and Surgical Wards, Emergency Department and sometimes Outpatient Subspecialty Clinics. The Fellow is responsible for providing both the initial consultation, as well as ongoing monitoring of the patient as appropriate. Additionally, the Fellow may receive phone calls for advice from parents of children with known renal disease, or from outside Referring Physicians and may be required to see an urgent clinic patient or new consult in clinic.

General Clinical Skills

KNOWLEDGE

Fluid & Electrolyte Disorders

- Demonstrate knowledge of the etiology, diagnosis and management of common fluid and electrolyte disorders, including:
 - hyponatremia/hyponatremia
 - hypokalemia/hyperkalemia
 - hypocalcemia/hypercalcemia
 - hypophosphatemia/hyperphosphatemia
 - magnesium disorders
 - metabolic acidosis
 - metabolic alkalosis

Acute Dialysis

- Demonstrate knowledge of the indications for acute dialysis
- Demonstrate knowledge of the available dialysis modalities, including indication/contraindications, and complications
- Be Proficient in the prescription and monitoring of continuous dialysis modalities (CVVH, CVVHD etc.)

Drug dosing in renal disease

- Demonstrate knowledge of the pathophysiology of altered drug metabolism in renal disease
- Demonstrate knowledge of which drug classes require adjustment for reduced levels of renal function
- Demonstrate a working knowledge of drug nephrotoxicity

Renal Biopsy

- Demonstrate knowledge of the indications for renal biopsy (closed and open) in the paediatric population
- Demonstrate knowledge of the preparation of a patient for a renal biopsy, the biopsy procedure and post-procedure complications and management.

Nephrolithiasis/Nephrocalcinosis

- Demonstrate knowledge of the pathophysiology, differential diagnosis, diagnostic tests and management of patients presenting with nephrolithiasis and nephrocalcinosis

Genetic Renal Diseases

- Demonstrate knowledge of paediatric genetic renal diseases (e.g.: ARPKD, congenital nephrotic syndrome, Denys-Drash, cystinosis) and those diseases of adults which may manifest in childhood (e.g.: ADPKD, Alport's)

Congenital/Urological diseases

- Demonstrate knowledge of the pathophysiology, and clinical course of common congenital and urological diseases of children, such as:
 - Posterior urethral valves Renal dysplasia
 - Renal hypoplasia Vesico-ureteric reflux Reflux nephropathy
 - Multicystic-dysplastic kidney Hydronephrosis
 - Ureteropelvic junction obstruction

Fetal Renal Disease

- Demonstrate knowledge of the renal disorders which may be detected antenatally.

Dysuria/pyuria

- Demonstrate knowledge of the pathophysiology, differential diagnosis, diagnostic tests and management of patients with dysuria and pyuria

SKILLS

- Be proficient in history-taking and physical examination of the patient with renal disease including patients presenting to the outpatient clinic and Emergency Room, and those in all inpatient units
- Be Proficient in the independent and comprehensive care of the nephrology patient, including formulation of a diagnosis and differential diagnosis, plan of investigation, plan of treatment, and long-term follow-up
- Be proficient in drug dosing for varying degrees of renal failure
- Follow a course of treatment and/or follow-up based on the renal biopsy results (Clinico-pathological correlation)
- Recognize emergency situations, and use appropriate management strategies for common nephrology emergencies
 - E.g.: hyperkalemia, severe hypertension, diuretic unresponsive pulmonary edema
- Demonstrate an awareness of the medico-legal responsibilities of a physician including accurate record keeping

Proteinuria/Nephrotic Syndrome

- Be Proficient in the diagnosis, and management of children with proteinuria, including those with new or previously diagnosed Nephrotic syndrome

Hematuria/Glomerulonephritis

- Be Proficient in the diagnosis and management of children with hematuria and acute glomerulonephritis

Hypertension

- Be Proficient in the investigation and management of children with hypertension, including:
- Ability to diagnose and investigate hypertension
- Emergency treatment of severe hypertension
- Antihypertensive agents, and their effects, side-effects, dosing, and indications

Acute Kidney Injury

- Demonstrate an approach to the patient with acute kidney injury
 - pathophysiology of acute kidney injury
 - definition
 - differential diagnosis
 - methods of evaluation
 - management including dialysis
- Be proficient in the diagnosis and management of genetic renal diseases
- Be proficient in the diagnosis and management of congenital/urological diseases of children
- Be present during counselling of pregnant mothers on the differential diagnosis, prognosis and post-natal management of antenatally detected fetal renal disorders

ASSESSMENT & LEARNING METHODS

These goals and objectives will be attained by the Fellow through providing the consultation service, interaction with the Nephrology Consultant and the referring team consultant, through self-directed learning, through didactic teaching sessions, and attendance at national and international meetings.

Achievement of these objectives will be evaluated at the end of each rotation, by direct observation of the Fellow's behaviour, knowledge and skills.

Documentation of Minimum Requirements for Training

- These are the minimum number of cases you are asked to document as part of your training. It is recommended you seek opportunities to attain a higher level of exposure as part of your self-directed learning and development of expertise.
- You should expect the demands of your post to exceed the minimum required number of cases documented for training.
- If you are having difficulty meeting a particular requirement, please contact your specialty coordinator.

Curriculum Requirement	Required/ Desirable	Minimum Requirement	Reporting Period	Form Name
Section 1 - Training Plan				
Personal Goals Plan (Copy of agreed Training Plan for your current training year signed by both Trainee & Trainer)	Required	1	Training Post	Personal Goals Plan Form
On Call Rota If the Fellow is assessed to be sufficiently competent during the course of their training, they may be considered for some on call duties and weekend cover. Initially this will be as first on call with consultant back up but can progress to solo cover if deemed competent.	Required	1	Training Post	Clinical Activities
Section 2 - Training Activities				
Outpatient Clinics				Clinics
General Nephrology	Required	40	Year of Training	
Specialist Nephrology	Required	80	Year of Training	
Transplant Clinic	Required	20	Year of Training	
Rapid Access	Required	20	Year of Training	
Low Clearance	Required	20	Year of Training	

Curriculum Requirement	Required/ Desirable	Minimum Requirement	Reporting Period	Form Name
Ward Rounds/Consultations				Clinical Activities
Consultant led (minimum 1 per week)	Required	40	Year of Training	
Fellow led (1 per week)	Required	40	Year of Training	
Haemodialysis rounds	Required	4	Year of Training	
Consultations (including Day Ward, in house and Nation-wide consults)	Required	1	Year of Training	
Emergencies/Complicated Cases	Required	10	Year of Training	Cases
Clinical Cases				Cases
Nephrotic Syndrome	Required	1	Training Programme	
Acute Glomerulonephritis	Required	1	Training Programme	
Tubulopathies	Required	1	Training Programme	
Chronic Renal Failure	Required	1	Training Programme	
Pyelonephritis with renal dysfunction	Required	1	Training Programme	
Transplant	Required	1	Training Programme	

Curriculum Requirement	Required/ Desirable	Minimum Requirement	Reporting Period	Form Name
Dialysis	Required	1	Training Programme	
Hemodialysis	Required	1	Training Programme	
Graft Dysfunction	Required	1	Training Programme	
Procedures/Practical Skills/Surgical Skills in older infants and children				Procedures, Skills & DOPS
Interpretation of tissue typing	Required	1	Year of Training	
Interpretation of cross match results	Required	1	Year of Training	
Additional/Special Experience Gained	Desirable	1	Training Programme	Clinical Activities
Relatively Unusual Cases	Desirable	1	Training Programme	Cases
ICU/CCU	Desirable	1	Training Programme	Cases
Chronic Cases/Long term care	Desirable	1	Training Programme	Cases
Management Experience	Desirable	1	Training Programme	Management Experience
Section 3 - Educational Activities				

Curriculum Requirement	Required/ Desirable	Minimum Requirement	Reporting Period	Form Name
Mandatory Courses				Teaching Attendance
APLS	Required	1	Training Programme	
HST Leadership in Clinical Practice (Year 3+)	Required	1	Training Programme	
Mastering Communications (Year 1)	Required	1	Training Programme	
Non – Mandatory Courses				Course Attendance
Childhood Development Disorders	Desirable	1	Training Programme	
Informing families of their child's disability (online)	Desirable	1	Training Programme	
NRP Neonatal Resuscitation Course	Desirable	1	Training Programme	
Ethics Foundation	Desirable	1	Training Programme	
Ethics for Paediatrics	Desirable	1	Training Programme	
An Introduction to Health Research	Desirable	1	Training Programme	

Curriculum Requirement	Required/ Desirable	Minimum Requirement	Reporting Period	Form Name
Performing Audit (Year 1)	Desirable	1	Training Programme	
STABLE	Desirable	1	Training Programme	
Other	Desirable	1	Training Programme	
Study days (attend as many study days as possible, minimum of 4 per year)	Required	4	Year of Training	Study Day Attendance
In-house activity attendance				Attendance at Hospital Based Learning
Grand Rounds (minimum 1 per month)	Required	10	Year of Training	
Journal Clubs (minimum 1 per month)	Required	10	Year of Training	
MDT meetings weekly	Required	40	Year of Training	
Psychosocial Meetings	Required	4	Year of Training	
Seminar	Required	1	Year of Training	
Lecture	Required	1	Year of Training	
Delivery of Formal Teaching (minimum of 1 formal teaching session per month)				Delivery of Teaching

Curriculum Requirement	Required/ Desirable	Minimum Requirement	Reporting Period	Form Name
Lecture/Presentation	Required	1	Year of Training	
Tutorial	Required	3	Year of Training	
Bedside teaching	Required	3	Year of Training	
Research	Desirable	1	Training Programme	Research Activities
Audit Activities and Reporting (1 per year either to start or complete, Quality Improvement (QI) project can be uploaded against audit)	Desirable	1	Year of Training	Audit and QI
Publications	Desirable	1	Year of Training	Additional Professional Experience
Presentations (minimum of 1 oral or poster presentation per year)	Desirable	1	Year of Training	Additional Professional Experience
National/International meetings	Required	1	Year of Training	Additional Professional Experience
Additional Qualifications	Desirable	1	Training Programme	Additional Professional Experience
Committee Attendance	Desirable	1	Training Programme	Additional Professional Experience

Curriculum Requirement	Required/ Desirable	Minimum Requirement	Reporting Period	Form Name
Section 4 - Assessments				
DOPS	Required	1	Year of Training	Procedures, Skills & DOPS
CBD	Required	4	Year of Training	Case Based Discussion
Mini-CEX	Required	1	Year of Training	Mini-CEX
Quarterly Assessments/End of Post Assessments	Required	4	Year of Training	Quarterly Assessment/ End of post
End-of-Year Assessment	Required	1	Year of Training	End of year Assessment