



**FACULTY OF
PAEDIATRICS**

ROYAL COLLEGE OF
PHYSICIANS OF IRELAND

Post CSCST TRAINING IN

PAEDIATRIC NEUROLOGY



This curriculum of training in Paediatric Neurology under the specialty of General Paediatrics was developed in 2017 and undergoes an annual review by the Subject Matter Expert Prof. Mary King, Dr Ann O’Shaughnessy, Head of Education, Innovation & Research and by the Training Committee. The curriculum is approved by the Faculty of Paediatrics.

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Introduction

Paediatric Neurology is the speciality that combines the special expertise in diagnosing and treating disorders of the nervous system with an understanding of medical disorders in childhood and the special needs of the child and their family and environment

The Post CSCST Fellowship in Paediatric Neurology is a one year programme designed to dovetail with the Irish Higher Specialist Training programme in General Paediatrics. It takes into account the major areas of competence required by the subspecialist in Paediatric Neurology and will be supervised by the Faculty of Paediatrics of the Royal College of Physicians in Ireland. Completion of this program will ensure the knowledge and competencies in all areas of the curriculum, meeting international standards for best practice and allowing candidates to practice as a subspecialist in Paediatric Neurology

Entry Requirements

Applicants for the Post CSCST Fellowship in Paediatric Neurology will have successfully completed the RCPI Higher Specialist Training programme in General Paediatrics within two years of the start date of the Post CSCST Fellowship programme.

Prior experience in Paediatric Neurology during General Paediatrics training would be an advantage.

Recruitment and Selection

Post CSCST Fellowship training in Paediatric Neurology will build on broad basic and early core specialist training in General Paediatrics. This is in line with training models internationally. Selection of candidates for Post CSCST Fellowship training in Paediatric Neurology will be via a competitive recruitment process coordinated by the relevant Training Body. Recruitment will follow similar timeline where possible to HST recruitment and post will commence in July of each year (unless otherwise specified).

Duration and Organisation of Training

The Post CSCST Fellowship in Paediatric Neurology is a one year training programme designed to dovetail with the Irish Higher Specialist Training programme in General Paediatrics. The curriculum is competency-based, however it is anticipated that the candidate will complete training within one year.

The curriculum takes into account the major areas of competence required by the subspecialist in Paediatric Neurology and will be supervised by the Faculty of Paediatrics of the Royal College of Physicians in Ireland. Doctors who have successfully completed the RCPI Higher Specialist Training programme in General Paediatrics and are within two years of completion will be deemed eligible to apply for the Post CSCST Fellowship in Paediatric Neurology. Completion of this program will ensure the knowledge and competencies in all areas of the curriculum, meeting international standards for best practice and allowing candidates to practice as a subspecialist in Paediatric Neurology .

Training Programme

The training programme offered will provide opportunities to fulfil all the requirements of the curriculum of training for Paediatric Neurology in approved training hospitals. Each post within the programme will have a named trainer/educational supervisor and the programme will be under the direction of the National Specialty Director for Paediatric Medicine

Trainee Numbers

It is expected that the Post CSCST Fellowship in Paediatric Neurology will be awarded to one candidate per year.

ePortfolio

The trainee will be required to keep their ePortfolio up to date and maintained throughout their Fellowship training. The ePortfolio will be countersigned as appropriate by the Trainer to confirm the satisfactory fulfilment of the required training experience and the acquisition of the competencies set out in the Curriculum. This will remain the property of the Trainee and must be produced at the end of year Evaluation meeting. At the end of year Evaluation, the ePortfolio will be examined. The results of any assessments and reports by the named trainer/educational supervisor, together with other material capable of confirming the trainee's achievements, will be reviewed.

Programme Management

- Coordination of the training programme will lie with the Medical Training Department.
- The training year will usually run from July to July in line with HST programmes
- Annual evaluations will usually take place between April and June each year
- Each trainee will be registered to the ePortfolio and will be expected to fulfil all requirements relating to the management of yearly training records
- Opportunities for audit and research may be available
- Each trainee will be issued with a training agreement on appointment to the training programme and will be required to adhere to all policies and procedures relating to Post CSCST Fellowships.

Specialty Section

Basic Neurological Knowledge and Skills

Objective: To acquire basic knowledge and skills in order to benefit from engaging in clinical training in Neurology.

Relating Structure and Function to Physical Findings and Complaints

Objective: In order to benefit from clinical training in the specialty, the trainee must first acquire a sound knowledge of neuroanatomy and neurophysiology and be capable of taking a full neurological history and carrying out a detailed physical examination of the nervous system including neurodevelopment assessment.

KNOWLEDGE

Basic Neurology

- Anatomy of the central, peripheral and autonomic nervous systems. Functional anatomy and co-ordination in the nervous system: neurophysiology and biochemistry, the autonomic and neuroendocrine systems, neurotransmitters.
- Able to perform a detailed physical examination of the nervous system.
- Able to evaluate the significance of symptoms and physical findings and suggest a differential diagnosis.
- Appreciates the importance of knowledge of the structure, function and biochemistry of the nervous system in understanding the basis upon which the symptoms and physical signs of disease may develop.

SKILLS

- To elicit and concisely report a factual medical, developmental, family, social and personal history in a patient as relevant to suspected neurological disease.

ASSESSMENT & LEARNING METHODS

- Mini-CEX

Basic Sciences: Specialities Relevant To Neurology Used To Support Neurological Practice

Objective: The trainee should have sufficient knowledge and skills in basic science and in the specialities relevant to neurology to be able to understand, assess and plan the management of neurological problems as they present in children and adolescents.

Investigations:

1. Clinical Neurophysiology

Objective: Acquire knowledge and skills to understand the role and practice of neurophysiology investigations in children and adolescents with disorders of the nervous system.

KNOWLEDGE

- EEG, EMG nerve conduction, evoked potentials
- Normal range of EEG findings, common epileptiform abnormalities.
- Capabilities and limitations of EEG in neurological disorders other than epilepsy.
- Role of monitoring techniques (telemetry, ambulatory).
- Use of EEG in evaluation of sleep disorders.
- EEG in neurological emergencies with impaired consciousness.
- Principles of techniques of EMG, NCS.
- Abnormalities in muscle disease; peripheral neuropathies, anterior horn cell disease and disorders of neuromuscular junction.
- Common abnormalities of Evoked Potentials (EP) in neurological diseases, particularly demyelination.
- Knowledge of role of intraoperative EP monitoring.
- Appreciation of the importance of close working relationship with Clinical Neurophysiologists, and need to provide clinical detail in referral.
- Appreciates the value and limitation of these techniques used in the investigation of neurological disease and the importance of critically evaluating the results obtained.
- Willing to explain to the child/adolescent and their parents/carers the procedures involved and to interpret the results obtained in ways which can assist them in understanding their significance.

SKILLS

- Ability to formulate and appropriate investigation plan.
- Interpret and explain reports/results.
- Interpretation of normal and more common EMG and NCS abnormalities
- Interpretation of normal and more common EEG abnormalities

ASSESSMENT & LEARNING METHODS

- Observe EMG
- Observe NCS
- CBD

2. Neuroradiology and Imaging

Objective: To provide the trainee with the skills and knowledge to select, explain, arrange radiology and/or imaging which is appropriate to the patient's needs in the management of neurological disorders, and to understand and interpret findings and reports.

KNOWLEDGE

- Ultrasound; Brain, spine, muscle,
- Imaging; CT, MRI Scans; myelograms; angiography, PET and SPECT studies
- Applications and limitations of investigative techniques
- To be able to explain the capability, risks and limitations of all common neuroradiological techniques.
- Appreciates the need of the neuroradiologist for full clinical information to be provided.
- Appreciates the need for close working with the neuroradiology services in arriving at a diagnosis and planning treatment.

SKILLS

- Request, interpret and utilise neuroradiological investigations for outpatients, inpatients and acutely ill children and adolescents in a cost effective manner.
- Explain the nature, risks and benefits of neuroradiological investigations to children and adolescents and their parents/carers.
- Recognise the anatomy of the neural axis from imaging studies and to recognise common abnormalities in children.
- Give a reasonable differential diagnosis of the observed abnormalities.
- Understand the role and place of interventional studies.

ASSESSMENT & LEARNING METHODS

- Weekly neuroradiology meetings
- CBD

3. Cerebrospinal Fluid

Objective: To understand normal and abnormal production and circulation of the CSF.

KNOWLEDGE

- Abnormal CSF and raised intracranial pressure
- CSF composition and dynamics. Anatomy and radiology of ventricular system. Biochemistry and immunology of CSF. Blood brain barrier.
- To understand the changes in CSF dynamics and composition in disease. Symptoms, signs and causes of raised intracranial pressure. Genesis of hydrocephalus.
- Indications and contraindications to LP. LP techniques. Methods of intracranial pressure monitoring.
- To be familiar with and be able to advise on the treatment of disorders of CSF.
- Always ready to explain the details and purpose of the procedure to the child/adolescent and their parents/carers and obtain informed consent.
- Seeks technical proficiency.

SKILLS

- Management of raised CSF and raised intracranial pressure
- To be able to carry out LP safely and with maximum patient comfort and to be familiar with other methods of CSF examination.

ASSESSMENT & LEARNING METHODS

- Lumbar puncture

Neuropathology

Objective: To understand the pathological basis of neurological disorders, recognise the scope and limitations of examination of material from biopsies and necropsies: recognise the needs and concerns of children and adolescents and their parents/carers.

KNOWLEDGE

Obtaining, preparing, interpreting pathological specimens

- Anatomy of brain sections, brain preparation.
- Histological, histochemical, immunocytochemical and E.M. techniques.
- Basic pathology of brain tumours.
- Basic pathology of:
 - Cortical dysplasia
 - Tumours
 - Demyelinating disorders
 - Axonal and demyelinating peripheral neuropathy
 - Muscle disorders
 - Inflammatory infection
 - Vasculitis
 - Guillain Barré
 - Neurodegenerative diseases e.g. mitochondrial disease, leukodystrophy
 - Meaning of gliosis
 - Granulomas
- Understands the need for discussion regarding specimens with laboratory staff, especially if special precautions needed.
- Obtain informed consent for a necropsy examination.
- Appreciates the importance of a detailed knowledge and understanding of the pathological basis of neurological disorders and the limitation of the methods available for tissue diagnosis
- Recognises and is prepared to respond to the concerns of children and adolescents and their parents/carers.

SKILLS

- Understand, interpret and explain a pathology report.

ASSESSMENT & LEARNING METHODS

- Study Day with Pathology
- Neuropathology Neuroscience weekly meeting

Pharmacology and the Nervous System

Objective: Understand the basis of, application, limitations and risks of neuropharmacological treatments.

KNOWLEDGE

Drugs and their use

- Synapse and neurotransmitter physiology.
- Principles of neuropharmacokinetics and pharmacodynamics.
- Modes of actions of drugs used to treat neurological diseases.
- Principles of pharmacological treatment
- Adverse effects of medications. Interactions involving medications.
- Awareness of need to respond to information needs of children and adolescents and their parents/carers.
- Recognises the importance of a full understanding of neurotransmitter physiology and the limitations and risks of neuropharmacological treatments in the management of children and adolescents.

SKILLS

- Able to take and evaluate a medication history.
- Able to plan treatment strategies, re-evaluate and awareness of cost implications.

ASSESSMENT & LEARNING METHODS

- Study Day

Immunology

Objective: To have working knowledge of those neurological disorders which have an immunological or inflammatory basis.

KNOWLEDGE

- Basic principles of immune responses in relation to the nervous system. The immunological basis underlying autoimmune neurological disease
- The clinical phenotypes of these diseases.
- The diagnostic techniques needed to confirm or refute these diseases, and their appropriate use.
- Immunosuppressive and immunomodulatory therapies: their actions, side effects and indications, and how critically to evaluate evidence for their efficacy.
- Appreciates the importance and knowledge of immunological and inflammatory mechanisms in understanding the neurological disease processes and in guiding the development of therapeutic strategies.
- Autoimmune encephalopathy such as NMDA and VGKC antibodies

SKILLS

- Competent in the recognition, of diagnosis and management of children and adolescents with autoimmune neurological disease.

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD

Genetics

Objective: To understand the principles of genetics as applied to Neurology; and particularly as it applies to children and adolescents with neurological disease.

KNOWLEDGE

- Genetics applied to neurology
- DNA, RNA, chromosomes, modes of inheritance (Mendelian, polygenic, multifactorial, mitochondrial)
- The genetic contribution to common multifactorial neurological disease
- Methods of DNA diagnosis including southern blotting, PCR, whole genome sequencing arrays and copy number variation
- Working knowledge of pathology, molecular biology in common genetic conditions
- To be familiar with the clinical presentation and diagnosis of the common neurogenetic diseases, e.g. Hereditary ataxias, muscular dystrophies, neuropathies, and neuro-cutaneous syndromes
- To understand the principles of genetic counselling including sensitive ethical issues surrounding confidentiality and consent (e.g. in Huntington's disease and the role of specialist genetics nurses)
- Utilize bioinformatics databases on human disease e.g. online Mendelian Inheritance in Man, NCI and Human Genome Project
- Recognise when it is most appropriate to take a detailed family history, to order DNA based diagnostic tests and to liaise with colleagues in Clinical Genetics
- Because of the rapidity of development in this field, basic skills in using electronic resources to aid in the diagnosis of Neurogenetic disease
- Exercises care in the translation of genetic information when counselling children and adolescents and their parents/carers
- Is fully aware of the important issues of confidentiality and consent surrounding ethical considerations

SKILLS

- To be able to take a detailed family history using appropriate standard nomenclature
- Recognises the important contributions from genetic information obtained, towards understanding neurological diseases
- Communicate the uses and limitations of risk variants in disease such as APOE-4 genotype

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD

Neuro-ophthalmology - Otology

Objective: To be competent to assess and manage appropriately ophthalmic and otological abnormalities as they may present in children and adolescents with neurological diseases.

KNOWLEDGE

- Disturbances of vision, hearing and balance
- To be familiar with principal methods used in neuro-ophthalmic diagnosis
- Applied anatomy and physiology of the visual and oculomotor system, hearing and balance
- History taking and examination relevant to the eyes and ears, vision, hearing, and balance
- Conditions which may affect hearing, balance, vision, eye movements, pupils and the eye lids
- Recognises the contribution of other specialist services in this field and liaises effectively with them

SKILLS

- Diagnosis and management of disturbance of vision, hearing and balance
- To form a differential diagnosis for common and uncommon visual symptoms
- To be competent in assessing dizzy children and adolescents and managing any underlying neurological cause
- To be able to diagnose and manage neurological causes of disturbances of hearing or balance, and to appropriately refer others
- Examination of the vestibuloocular system

ASSESSMENT & LEARNING METHODS

- Study Day: Neuro-ophthalmology
- Study Day: Neuro-otology

Child Psychology and Neuropsychiatry

Objective: To understand the basis of normal and abnormally functioning memory, attention, perception and language, and to be familiar with basic psychological testing.

KNOWLEDGE

- Be familiar with psycho-pharmacology for child and adolescent mental health problems
- Be familiar with the theoretical bases, principles and indications of the major models of psychological treatment
- The use and limitations of questionnaire measures in child and adolescent mental health, including disorder-specific and more global functioning measures
- The epidemiology, aetiology and co-morbidities of a range of child psychiatric conditions
- The indications for a range of therapies and medication for childhood psychiatric conditions
- Knowledge of the resources for families and professionals relevant to children with a range of psychiatric disorders

SKILLS

- Perform simple bedside testing of higher cognitive function e.g. mini-mental state examination.
- Interpret a neuropsychological report in the context of the child's/adolescents overall management.
- Demonstrate a high level of skill in engaging with children, adolescents and parents/carers, including "hard to reach" children and families
- Be able to complete a mental state examination and to assess the mental health problems of a child or young person
- Demonstrate developing skills in reaching a psychiatric formulation
- Demonstrate developing skills in judging the severity of emotional and behavioural difficulties and their impact on children and families
- Demonstrate an understanding of the ways in which emotional, behavioural and developmental problems can result from physical disorders and demonstrate appropriate thresholds for involvement of Child and Adolescent Mental Health Services (CAMHS) professionals for advice or direct assessment
- Demonstrate an understanding of the roles and potential contributions of members of the multidisciplinary CAMHS team
- Assess and manage acute and chronic presentations of mental health conditions
- Know when to seek advice from the CAMHS in a timely fashion

ASSESSMENT & LEARNING METHODS

- Study Day: Psychology

Clinical Encounters in Neurology

Objective: The trainee should acquire the knowledge and skills necessary to be fully competent to assess and manage children and adolescents presenting neurological problems in the following clinical contexts.

Infections of the Nervous System

Objective: To have an understanding and a working knowledge of neurological disorders which have an infectious basis and the ability to diagnose, investigate and treat infectious diseases of the nervous system

KNOWLEDGE

Causes and management of infection in the nervous system

- Basic principles relevant to pathogenesis, clinical presentation, management and complications of neurological infectious disease.
- The clinical phenotypes of these diseases.
- Clinical features, investigation findings, treatment and prognosis of:
 - Bacterial/viral meningitis
 - Encephalitis (e.g. Herpes Simplex)
 - Congenital infection
 - Opportunistic infections in the immunosuppressed
 - Syndromes associated with herpes zoster and herpes simplex
 - Neurological aspects of TB and AIDS
 - Spinal infections and cortical thrombophlebitis
 - The neurological aspects of endocarditis and septicaemia
- The epidemiology of common neurological infections.
- Available vaccination programmes.
- Understand the effectiveness of and need for vaccination against specified neurological infections. The public health responsibilities of physicians.
- To become competent in the recognition, prevention, diagnosis and management of children and adolescents with these disorders.
- Recognises the supreme importance of the early recognition and the correct diagnosis of infection in the nervous system.
- Fully appreciates the need for close liaison and effective working with other specialists and teams in the co-ordination of multidisciplinary care.
- Demonstrates a responsible attitude to the public health aspects of infections.

SKILLS

- The diagnostic techniques needed to confirm or refute infection in the nervous system and their appropriate use.
- Anti-microbial therapies and their proper use; preventative medicine in relation to neurological infections.
- Services offered by microbiology, interpretation of reports, antibiotic resistance, diagnostic methods available for common neurological infections.
- To know how to liaise and work closely with Infectious Disease Physicians, Microbiologists and ICU teams in order properly to co-ordinate multi-disciplinary care where appropriate.

- Assessment of vital signs and respiratory function in critically ill children and adolescents and timing of referral for intensive care.
- Notification of infectious disease, advice to and referral/treatment of contacts

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD

Cerebrovascular Disease

Objective: The trainee should have the knowledge, skills and competencies to diagnose, assess, manage effectively and advise on the care of children and adolescents who present with the neurological effects of cerebrovascular diseases.

KNOWLEDGE

Stroke and TIA, Haemorrhage

- Clinical features of stroke and TIA. Pathophysiology of cerebral infarction, cerebral haemorrhage
- To be familiar with the anatomy of the cerebral circulation and its appearances on imaging, CT, MRI, and DSA appearances
- Investigations available, including blood tests, carotid ultrasound, TCD, echocardiography, CT, MRI, MRA, and DSA. Rare causes of stroke risks and costs of investigations
- Value and organisation of multidisciplinary stroke care, nutrition after stroke, rehabilitation techniques, community stroke care
- Knowledge of stroke scales
- Epidemiology and prevention, risk factors for stroke
- Shows willingness to use the full range of professional skills and resources available for patient's support and rehabilitation
- Recognises the supreme importance of preventive measures in addressing the problem of vascular disease within the nervous system
- Anatomy and pathology of subarachnoid haemorrhage, cerebral aneurysm and AVM. Interventional, surgical and radiotherapy treatment

Intracranial venous thrombosis

- Symptoms, investigation and treatment of intracranial venous thrombosis

SKILLS

- To form a differential diagnosis of stroke and TIA
- To order appropriate investigations for stroke
- Manage acute stroke including the role of thrombolysis, antiplatelet therapy, control of blood pressure, complications of stroke
- Manage acute stroke where immediate large vessel occlusion may require neuroradiological stenting or embolectomy
- Assess impairment, activities of daily living and disability in a stroke patient
- To give advice and prescribe treatment for stroke prevention
- To advise on the treatment of subarachnoid haemorrhage, cerebral aneurysm and AVM.
- To manage intracranial venous thrombosis
- Recognises that most acute stroke in children without cardiac/haemo-oncology disease is inflammatory vascular disease in aetiology

ASSESSMENT & LEARNING METHODS

- Neurovascular meetings in house
- CBD

Disordered Consciousness

Objective: To enable the trainee to assess the unconscious, unresponsive patient, to formulate a plan of investigation and management action in the best interests of the child/adolescent and within the legal frameworks provided.

KNOWLEDGE

- The anatomy and physiology of consciousness, and the pathophysiology of disorders of consciousness.
- Definitions, causes, pathophysiology, clinical features and prognosis of persistent vegetative state, locked in state and brainstem death.
- Legal issues relating to disorders of consciousness.
- Assessment of patient with disordered consciousness.
- The use of tests for brainstem death.
- Interpersonal skills relating to communication, management and resolution of issues with the family of children and adolescents with disorders of consciousness.
- Appreciates the right of the patient (and of their relatives) to be kept informed of the results of investigations, other assessments and treatment intentions and their right to challenge or refuse advice.
- Fully aware of the need for effective communication in difficult circumstances and of legal and ethical aspects in forming decisions.

SKILLS

- Assess and manage the unconscious child/adolescent

ASSESSMENT & LEARNING METHODS

- Study Day

Epilepsy and Altered Consciousness

Objective: To acquire knowledge, skills and attitudes to evaluate and treat children and adolescents with epilepsy.

KNOWLEDGE

- Distinction of epilepsy from other paroxysms, management of epilepsy
- Differential diagnosis of paroxysmal and transient events.
- Indications, scope and limitations of: EEG, brain imaging, psychology, haematology and biochemistry.
- Understand the principles of antiepileptic drug treatment: efficacy, adverse effects, interactions; treatment of chronic epilepsy; treatment of refractory seizures, psychological and psychiatric concomitants of epilepsy.
- Role of neurosurgery.
- Epilepsy in relation to pregnancy, contraception, driving, legal aspects, risk of sudden death.
- Psychological and social consequences of epilepsy. Patient support groups and charities.
- Arrange appropriate investigation in evaluating children and adolescents with epilepsy, and possible epilepsy.
- Advising, explaining antiepileptic drug treatment appropriate to the child's/adolescent's needs.
- Able to convey important relevant information to children and adolescents and their parents/carers.
- Ability to manage emergency situations e.g. serial seizures, status epilepticus.
- Sensitive to and willing to deal with the concerns of children and adolescents and their parents/carers and the legal and employment implications of the diagnosis of epilepsy in an individual.
- Knowledge of NICE guidelines on epilepsy
- Knowledge of the role of paediatric neurology services including the use of newer AEDs, the use of non-drug treatments such as the ketogenic diet, and the selection of patients for surgical treatment of epilepsy, vagal nerve stimulation and novel treatments

SKILLS

- Diagnose and management of epilepsy

ASSESSMENT & LEARNING METHODS

- Study Day
- Mini-CEX
- CBD

Head Injury (accidental and non-accidental)

Objective: To provide trainee with the skills and knowledge to assess the head injured patient, including gaining the ability to perform immediate resuscitative measures and formulate a strategy for immediate and short-term management.

KNOWLEDGE

- Immediate and early phase management of head injury
- Primary and secondary effects of head injury.
- The Glasgow Coma Scale.
- Recognises symptoms and signs of head injury including extradural and subdural haematomas, increased intracranial pressure.
- Understand and can manage post-concussion syndrome, post-traumatic headache and post-traumatic epilepsy.
- Serial assessment of head injury patient, indications for intervention including urgent and delayed neurosurgery.
- Appreciates the value of multidisciplinary team working and the need to involve other specialists at times in optimising the care and rehabilitation of children and adolescents following head injury.
- Willing to meet and respond to the concerns and anxieties of the child's/adolescent's parents/carers.

SKILLS

- Diagnosis of suspected non-accidental head injury using a multidisciplinary and multi-agency approach
- Management of acute and sub-acute head injury
- Rehabilitation aspect of head injuries

ASSESSMENT & LEARNING METHODS

- Study Day
- Mini-CEX: in ICU

Regression and Neurodegenerative Disease

Objective: To be able to assess and manage children and adolescents with regression

KNOWLEDGE

- Know the presentations, differential diagnosis and investigations of common neurodegenerative conditions, including metabolic, mitochondrial and neurotransmitter disorders
- Know the differential diagnosis of psychomotor regression presenting in adolescence

SKILLS

- Able to recognise regression of developmental skills
- Able to demonstrate a systematic and logical approach to the investigation of neurodevelopmental regression guided by age, ethnicity and other clinical features
- Long-term management of neurometabolic and neurodegenerative disorders

ASSESSMENT & LEARNING METHODS

- Study Day

Demyelinating Diseases

Objective: To be competent to diagnose, assess and advise on the early and long term management of children and adolescents with demyelinating diseases and disability arising as a result.

KNOWLEDGE

- Demyelination: causes, recognition, management
- Pathogenesis, presentation and clinical manifestations of multiple sclerosis and related conditions, such as acute disseminated encephalomyelitis, Neuromyelitis Optica (NMO) Behcet's disease,
- The role of imaging and other investigations in the assessment of demyelinating disease
- Drugs and other available treatments
- The ability to formulate a strategy for investigation, assessment and management of a child/adolescent with demyelinating disease
- Recognises how an improved understanding of demyelinating diseases has influenced and guided treatment to date, and the importance of using emerging knowledge appropriately to the advantage of children and adolescents
- Monoclonal and other biological therapies such as natalizumab and fingolimod
- Know the differential diagnosis of Multiple Sclerosis (MS), including Acute disseminated encephalomyelitis (ADEM)
- Know the role of steroids, symptomatic therapies and disease modifying therapies
- Recognise typical magnetic resonance (MR) appearances of multiple sclerosis and differential diagnosis
- Knowledge of multiple sclerosis, clinically isolated syndrome, optic neuropathy, neuromyelitis optica etc.

SKILLS

- Able to take a history from a child/adolescent and their parents/carers with demyelinating disease; identify the salient features, and identify signs through the neurological examination
- Application of McDonald criteria in the diagnosis of MS
- Assessing risk related to new biological therapies
- Able to diagnose relapsing and remitting multiple sclerosis
- Able to initiate appropriate steroid treatment in an acute relapse of multiple sclerosis

ASSESSMENT & LEARNING METHODS

- Journal Club
- Test ability of application of McDonald criteria

Disorders of the Spine and Spinal Cord

Objective: To provide trainees with skills and knowledge to assess and manage the child/adolescent with a neurological disturbance affecting the spinal cord.

KNOWLEDGE

- The anatomy of the spine and spinal cord, features of regional damage at different levels.
- Clinical features of spinal cord, nerve root and cauda equina syndromes
- Indications for urgent investigation including an understanding of the potential and limitations of spinal MRI scanning
- Common neurosurgical procedures performed on the spine and spinal cord. Their indications, limitations and risk
- Principles of management of paraplegia and the role of specialist spinal injury units
- Advise on and expedite the emergency management of spinal cord or cauda equina compression

SKILLS

- Recognition and management of acute and progressive spinal cord damage
- To identify important symptoms and signs of spinal cord dysfunction through neurological examination
- The ability to formulate a strategy for investigation of children and adolescents with disorders of the spine and spinal cord

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD

Movement Disorders

Objective: To be able to diagnose, investigate and manage common movement disorders to include Parkinsonism, chorea/athetosis, dystonia, tics and tremor.

KNOWLEDGE

- Chorea/athetosis, Dystonia, Parkinsonism, Tremor, Myclonus
- Specific knowledge of MRI/CT scan appearances in movement disorders: use of gene testing, blood and CSF investigations
- Knowledge of optimal appropriate therapy/treatment of movement disorders

SKILLS

- Interpret clinical features and make differential diagnosis in chorea/athetosis, dystonia, tics, tremor and myclonus
- Use of appropriate investigations to make a diagnosis and guide treatment
- Provide specialist spasticity and dystonia management, usually working in partnership with disability orthopaedic and neurosurgery services

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD

Disorders of Peripheral Nerves and Muscles

Objective: To be familiar with the clinical presentation and diagnosis of common neuromuscular conditions, to recognise typical patterns of motor and sensory deficit and formulate an appropriate differential diagnosis.

KNOWLEDGE

- Background knowledge of the anatomy and pathology of peripheral nerve and muscle
- Neuropathies:
 - Axonal and demyelinating
 - Entrapment neuropathies and plexopathies
 - Environmental toxin and drug-induced neuropathy Inflammatory/immune
 - Critical illness neuropathies and myopathies
- Inflammatory muscle disease
- Inherited disease of muscle and nerve; muscular dystrophy, Charcot-Marie-Tooth disease
- Disorders of the neuromuscular junction; myasthenia gravis etc.
- Be familiar with acute and chronic presentations of disease of muscles and nerves

SKILLS

- Diagnose and management of common neuromuscular conditions
- Management of acute neuromuscular paralysis
- To be able to interpret the results of nerve conduction studies and EMG and apply these to clinical decision-making
- To be clinically competent in the assessment and management of children and adolescents with acute and chronic neuromuscular paralysis both in the general ward and intensive care setting
- Interpretation of acute spinal/brain imaging on children/adolescents with acute paralysis
- Diagnose children and adolescents with neuromuscular disorders
- Collaborate with disability services for long-term management including new treatment trials
- Manage complications by collaborating with spinal, respiratory (including non-invasive ventilation) and cardiac services
- Recognise that end-of-life care is an important aspect of services for some of these disorders

ASSESSMENT & LEARNING METHODS

- Study Day

Disorders Affecting the Cranial Nerves

Objective: To equip the trainee with the knowledge necessary to diagnose disorders of the cranial nerves and their central connections, to carry out appropriate investigations, and to formulate management plans for these disorders.

KNOWLEDGE

- Cranial neuropathies
- The anatomy of the skull base, particularly the orbit, cavernous sinus, pituitary fossa, foramen magnum and jugular foramen
- Pathological processes involving the cranial nerves and their central connections.
- Methods of clinical assessment of cranial nerve function
- The use and limitation of investigative techniques in the cranial nerves, including CSF analysis, imaging, EMG, video fluoroscopy, VER, ERG and audiometry

SKILLS

- Management of cranial nerve disorders including multiple disciplinary approaches to cerebellopontine angle and pituitary disorders

ASSESSMENT & LEARNING METHODS

- Journal clubs

Headache

Objective: The trainee will be able to diagnose and treat common causes of headache and distinguished benign causes from sinister ones.

KNOWLEDGE

- Assessment and management of children and adolescents complaining of headache
- Common causes of headaches, persistent or recurrent. Clinical features distinguishing different causes and types including psychological
- Investigatory techniques e.g. appropriate urgent use of blood tests, lumbar puncture, brain scanning

SKILLS

- Advise and arrange treatment which is appropriate to the child's/adolescent's needs
- Differentiate common causes and more serious underlying problems of headaches
- Take a history from headache sufferer, recognising important diagnostic features and identifying a psychological contribution
- Examination of the nervous system, particularly identification of papilloedema, visual field defects. Investigate appropriately

ASSESSMENT & LEARNING METHODS

- CBD

Sleep Disorders

Objective: To acquire knowledge, skills and attitudes to evaluate and treat children and adolescents with common sleep disorders.

KNOWLEDGE

- The diagnosis, effects of sleep disorders and their management
- Differential diagnosis of sleep disorders. Narcolepsy, daytime hyper somnolence, parasomnia, obstructive sleep apnoea
- Effects of neurological conditions on sleep
- Indications, scope and limitations of the sleep laboratory. Effects of sleep on the EEG.
- Principles of physical treatment. Principles of pharmacological treatment
- Consequences and complications of sleep disorders
- Understands the role of investigations in evaluation of children and adolescents with possible sleep disorders

SKILLS

- Able to evaluate a history of disordered sleep and reach an appropriate diagnosis
- Able to advise and / or inform the family of the nature of sleep disorder and initiate treatment if necessary

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD

Intensive Care

Objective: To enable the trainee to manage neurological disorders in the neurological or general intensive care unit. The level of competence will be that to be expected of a consultant neurologist with access to adequate diagnostic investigations and with adequate anaesthetic, neurosurgical and nursing support available.

KNOWLEDGE

- Neurological assessment in ICU including withdrawal of care and palliation
- Neurological complications of major surgery
- Understands the principles of cardiovascular and respiratory support
- Indications for and methods of artificial nutrition of children and adolescents in the ITU

SKILLS

- Manage neurological disorders in the neurological or general intensive care

ASSESSMENT & LEARNING METHODS

- Attend in-house ICU training
- CBD

Palliative Care

Objective: To provide the trainee with the knowledge and skills of the role of palliative care in managing children and adolescents in the end stages of neurological disorders.

KNOWLEDGE

- Be familiar with local and national guidelines on withdrawing and withholding treatment
- Be familiar with guidelines on the management of sudden infant death
- Be aware of legal and ethical issues relating to withdrawing life support
- Know the importance of seeking advice when treatment may not be in the best interests of a child
- Know about appropriate therapeutic intervention in symptom control
- Be aware of the ethical issues in therapeutic intervention in children with life-limiting conditions
- Know about local opportunities for respite care, including hospice availability
- Know the tests for brain stem death
- Be aware of local bereavement support services
- Understand the need for respect of the wishes of the child or your person particularly when these are different from those of the family and health professionals
- Know about guidelines on the management of sudden infant death
- Know about the broad definition of palliative care in childhood
- Know the differential diagnosis of chronic sensory symptoms and chronic pain

SKILLS

- Recognise factors which determine when care of a patient becomes palliative
- Recognise loss and grief and their effects on the health and well-being of children, families and professionals
- Recognise the skills and experience of other professionals, acknowledge personal needs for support and the needs of other professionals involved in the care of the dying child for support networks
- Recognise factors which determine when care of a patient becomes palliative
- Investigate and manage chronic pain and chronic sensory symptoms appropriately

ASSESSMENT & LEARNING METHODS

- Time in palliative care
- MDT meetings with palliative care

Rehabilitation

Objective: To provide the trainee with the knowledge and skills to assess function and prognosis, advise on setting realistic goals and assist in the planning of programmes for the rehabilitation of children and adolescents with various neurological problems.

KNOWLEDGE

Trauma to central and peripheral nervous systems

- Aware of the implications of severe head injury and the possibilities for rehabilitation
- Know about other neurological trauma such as brachial plexus injury
- Aware of acute management and need to transfer appropriately
- Work effectively with the multidisciplinary team to manage the medium and longer term applications and rehabilitation

SKILLS

- Planning rehabilitation of children and adolescents
- Multidisciplinary team meetings
- Recognise the place of occupational therapy, physiotherapy and speech and language therapy
- Able to lead initial acute management and transfer appropriately

ASSESSMENT & LEARNING METHODS

- Study Day

Participate in multidisciplinary assessment of children/adolescents undergoing rehabilitation in the hospital setting

Minimum Requirements for Training

Please note:

- These are minimum tracking requirement. This generally means that in practice, trainees will perform above the stated requirements; however, for record tracking purpose, the following figures have been allocated.
- Where the minimum requirement state “1”, there is no allocated minimum – eLogbook will automatically default to “1”.

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 Programme	Form 052
Personal Goals Review Form	Desirable	1	Training Programme	Form 137
Weekly Timetable (Sample Weekly Timetable for Post/Clinical Attachment)	Required	1	Training Programme	Form 045
On Call Rota	Desirable	1	Training Programme	Form 064
Section 2 - Training Activities				
Outpatient Clinics				
Epilepsy	Required	25	Training Programme	Form 001
Neuromuscular	Required	10	Training Programme	Form 001

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Movement disorders	Required	5	Training Programme	Form 001
Inflammatory disorders	Required	10	Training Programme	Form 001
General Neurology	Required	40	Training Programme	Form 001
Ward Rounds	Required	40	Training Programme	Form 002
Consultations	Required	20	Training Programme	Form 002
Emergencies/Complicated Cases	Required	1	Training Programme	Form 003
Procedures/Practical Skills				
Interpretation of EEG	Required	100	Training Programme	Form 004
Additional/Special Experience Gained	Desirable	1	Training Programme	Form 005
Section 3 - Educational Activities				
Mandatory Courses				
Headache	Desirable	1	Training Programme	Form 006
Movement Disorder	Desirable	1	Training Programme	Form 006
Neonatal Neurology	Desirable	1	Training Programme	Form 006
PET 1, 2, and 3	Required	1	Training Programme	Form 006
Non – Mandatory Courses	Desirable	1	Training Programme	Form 007
Participation at In-house activities minimum of 1 per month from the categories below:				

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Grand Rounds	Required	10	Training Programme	Form 011
Journal Club	Required	20	Training Programme	Form 011
MDT Meetings	Required	20	Training Programme	Form 011
Delivery of Teaching (1 per month)				
Lecture	Required	10	Training Programme	Form 013
Tutorial	Required	10	Training Programme	Form 013
Bedside Teaching	Required	10	Training Programme	Form 013
Audit Activities and Reporting (1 per year to start or complete, Quality Improvement (QI) projects can be uploaded against audit)	Required	1	Training Programme	Form 135
Publications	Desirable	1	Training Programme	Form 016
Presentations	Desirable	1	Training Programme	Form 017
National/International meetings	Desirable	1	Training Programme	Form 010
Additional Qualifications	Desirable	1	Training Programme	Form 065
Section 4 - Assessments				
CBD	Required	1	Training Programme	Form 020
DOPS				
Interpretation of EEG	Required	1	Training Programme	Form 022
Mini-CEX (At least two Mini-CEX assessments)	Required	2	Training Programme	Form 023

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Quarterly Assessments/End-of-Post Assessment	Required	4	Training Programme	Form 092
End-of-Year Assessment	Required	1	Training Programme	Form 092