Guidelines

for

Competency Based Training Programme

in

Pediatric Neurology

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**SRI AUROBINDO UNIVERSITY**

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**INTRODUCTION**

The specialty of Pediatric Neurology, developed as a Sub-Specialization of Pediatrics, is predominantly concerned with the care of pediatric patients with neurological problems. It is a branch of Pediatrics concerned with assessment and evaluation, investigation, management and research into diseases involving neurological disorders.

**PROGRAMME GOAL**

The goal of Pediatric Neurology Fellowship program is to provide specialized training in Pediatric Neurology to produce competency in all the various fields of medical management of children with neurological disorders, by obtaining specialized training in our Institute over a stipulated period of 18 months. These specialists will be capable of providing subsequent such care of children with neurological disorders in the community as well as clinical tertiary care centers. They shall recognize the health needs of the community and carry out professional obligations ethically and in keeping with the objectives of the National Health Policy.

# PROGRAMME OBJECTIVES

The aim of the course is to impart thorough and comprehensive training to the candidate in the various aspects of the specialty to enable him/her:

1. The candidate should gain knowledge, learn skills, and solve problems related to all common pediatric neurology disorders.
2. To function as consultant in the specialty
3. To plan and set up independent Pediatric Neurology Unit catering to clinical and investigative Pediatric Neurology
4. To carry out and help in conducting applied research in Neurosciences.

# ELIGIBILITY CRITERIA FOR ADMISSIONS TO THE PROGRAMME

## PDCC Pediatric Neurology Course:

* 1. Any medical graduate with DNB/ MD Pediatrics qualification,
  2. Admission to 12 months PDCC Pediatric Neurology course is only through Entrance Examination conducted by SRI AUROBINDO UNIVERSITY.
  3. The exam will be conducted in 2 phases. Phase 1 theory exam consisting of multiple choice questions. Phase 2 will be a interview based.

# Duration of Course: 12 months

# TEACHING AND TRAINING ACTIVITIES

## TEACHING PROGRAMME

The following teaching schedule is prescribed for the course:

1. Outpatient service - 3 days a week
2. Major ward rounds - 3 days a week
3. Emergencies/night duties- 2 days a week
4. Seminars - Once a week
5. Practice parameters/views and reviews – on alternate weeks.
6. Journal club - Once in Two weeks
7. Neuroradiology (teaching session) - Once in Two weeks
8. A poster and /or oral presentation at least once during their training period in a recognized conference.
9. One research publication (original article/review article/case series/case report) in a peer reviewed journal.

* The rounds should include bedside sessions, file rounds & documentation of case history and examination, progress notes, round discussions, investigations and management plan, interesting and difficult case unit discussions.
* The candidate will be required to attend acute care neurology cases while on night duties and as required.
* The training program would focus on knowledge, skills, research and attitudes (behavior), all essential components of education. It is being divided into theoretical, clinical and practical in all aspects of the delivery of the rehabilitative care, including methodology of research and teaching.

1. Knowledge:

* Anatomy, physiology, and embryology of the central and peripheral nervous system.
* Pathophysiology, diagnosis, management and prognoses of children presenting with developmental delay or regression, cerebral palsy, intellectual disability, epilepsy, head injury, headache, stroke, metabolic disorders, neuromuscular problems and movement disorders in children.
* Acute management of seizures, coma, and raised intracranial pressure and other neurological emergencies including ventilation, plasmapheresis etc.
* Pharmacology of CNS medications

1. Research:

* Develop the basic skills required to perform clinical studies such as case reports and series, retrospective studies, and proposals for prospective studies. The candidate will be required to conduct at least one investigative project during the course and present at least one paper/poster in National conferences

1. Skills: the trainee should be able to:
   1. Achieve competence in the neurological examination and neurodevelopmental assessment of the newborn, infant, and older children
   2. Know the utility, limitations, and interpretation of the results of lumbar puncture, EEG, EMG, evoked potentials, Cranial US, CT, MRI, MRA, MR Spectroscopy, Cerebral Angiography and Isotope scans.

**COMPETENCIES**

After completing the Neurology Fellowship course the trainee will be able to -

1. Provide primary, secondary and tertiary care to all children with neurological disorders including intensive care of a high standard to the critically sick children with neurological disorders and children with neurological disabilities using advanced therapeutic and supportive modalities and skills. In this regard:
   1. He / she will also be able to effectively plan therapeutic, rehabilitative, preventive & promotive measures or strategies.
   2. He / she will have the ability to set up Pediatric neurology units independently.
   3. He / she will be able to take rationale decision in the face of ethical dilemmas in various –pediatric neurology diseases.
   4. He / she will demonstrate empathy & humane approach towards patients & their families.
   5. He / she will exhibit communication skills of high order and demonstrate compassionate attributes in the field of Neurology.
   6. He / she will use and maintain the essential pediatric neurology/ electrophysiology equipments and keep abreast with advances in pediatric neurology care technology.
2. The trainee will implement a comprehensive follow up and early intervention program for cerebral palsy and similar developmental disorders, counsel and advice rehabilitation of the neurodevelopmentally and physically challenged infants.
3. The trainee will be able to seek and analyze new literature and information on Neurology, update concepts, and practice evidence based Neurology. The trainee will be able to demonstrate adequate managerial skills.
4. The trainee will participate in the community programs and at the secondary level of health system and will educate the public on epilepsy and related disorders.
5. He/she would work as a productive member of the interdisciplinary team consisting of Physiotherapist, Occupational Therapist, speech therapist, Neurosurgeons, other doctors, nurses and grassroots functionaries providing care to the pregnant mother, the fetus and newborn and children

# TRAINING ROTATIONS:

# The trainee will be posted in different specialities as follows-

# Pediatric Neurology - 12 months

# Neurology (adult) – 1 month

# Neurosurgery – 1 month

# Neuroradiology – 1 month

# Pediatric Neurophysiology – 2 months

# Adult Neurophysiology – 1 month

# SYLLABUS

* 1. **Development of the Infant and Young Child**
     1. Anatomy of Neurodevelopment
     2. Physiology of Neurodevelopment
     3. Assessment of Normal Development
     4. Variations of the Normal Development
     5. The Abnormal Child; Early Markers of CP etc
     6. Approach to a Child with Developmental Delay
  2. **CNS Malformations**
     1. Normal Anatomy of the CNS
     2. Common CNS Malformations
     3. Surgical Management of CNS Malformations
  3. **Seizure Disorders in Childhood**

1. Seizures and Non Seizures
2. Febrile Seizures
3. Classification /Evaluation and Management of Epilepsy
4. Epileptic Syndromes
5. Status Epilepticus
6. Intractable Epilepsy
7. EEG in Seizure Disorders
8. Surgical Management of Seizure Disorders
   1. **Infections of the CNS**
9. Acute Pyogenic Meningitis
10. Neonatal Meningitis
11. Chronic Meningitis
12. Brain Abscess
13. Acute Encephalitis
14. Cerebral Malaria
15. Acute Febrile Encephalopathy
16. Neurocysticercosis
17. HIV Encephalopathy
18. SSPE
19. Congenital Infections
20. Laboratory Diagnosis Of CNS Infections
    1. **Autoimmune and Post Infectious Diseases**
21. Primary Demyelinating Diseases of the CNS
22. ADEM, Optic Neuritis, Acute Transverse Myelitis
23. Immunologically Mediated Diseases Affecting the CNS Gray Matter, Peripheral Nervous System
24. Systemic Vasculitides With Nervous System Manifestations
    1. **Neurodegenerative Disorders (In Co-Ordination with the Departments of Pathology and Radiodiagnosis)**
       1. Classification, Approach to a patient – gray matter, white matter
       2. Diagnosis (including histopathology and neurogenetics)
       3. Management
       4. Antenatal counseling
    2. **Neurometabolic disorders including mitochondrial disorders (in co-ordination with the Departments of Pathology and Radio diagnosis)**
       1. Classification, evaluation and approach to a patient
       2. Neurogenetics
       3. Management including antenatal counseling
       4. Role of histopathology
    3. **Chromosomal anomalies**
       1. autosomal abnormalities
       2. sex chromosomal abnormalities
       3. Chromosomal abnormalities in various dysmorphic syndromes
    4. **Toxic and nutritional disorders**
25. toxic disorders : lead, thallium, arsenic, mercury, aluminum, organic toxins, alcohol, bacterial toxins
26. nutritional disorders; protein energy malnutrition, Vitamin deficiencies, infantile tremor syndrome
    1. **Neurocutaneous syndromes**

Neurofibromatosis, Tuberous Sclerosis, Sturge Weber Syndrome etc.

* 1. **Movement disorders**

including cerebellar dysfunction Ataxias, chorea, dystonias, Tics etc

* 1. **CerebroVascular disorders**
     1. Arterial thrombosis
     2. Venous thrombosis/embolism
     3. Intracranial bleed
     4. Stroke
     5. Role of Radioimaging
  2. **Neonatal neurology**
     1. Neonatal seizures
     2. Hypoxic encephalopathy
     3. Intraventricular Hemorrhage
     4. Clinical neurological assessment
     5. Role of EEG, Ultrasonography, CT scan
     6. Neonatal seizures
     7. ICH
     8. Brain edema
     9. Neuromuscular disorders
     10. Degenerative disorders
     11. CNS malformations
  3. **Brain tumors**
     1. Features , Classification ,Evaluation and management
     2. Role of Radiotherapy
  4. **Spinal cord disorders**
  5. **Neuromuscular disorders**
     1. Evaluation and investigation
     2. Histopathological changes in different disorders
     3. Developmental disorders of muscle
     4. Muscular dystrophies
     5. Endocrine and metabolic myopathies
     6. Inflammatory myopathies
     7. Disorders of Neuromuscular transmission
     8. Spinal muscle atrophy
     9. Motor neuron disease
     10. Autonomic neuropathies
     11. Guillain Barre syndrome
  6. **Intellectual Disability**
     1. Assessment of intelligence quotient

1. Causes, Evaluation
2. Prevention / Role of antenatal counseling
   1. **Behavioral and Pervasive disorders (in co-ordination with the Departments of Psychiatry and with NGO’s in the schools and field)**
3. Attention Deficit Hyperactivity disorders (ADHD), Autistic spectrum Disorder
4. Learning disability
   1. **Coma in Pediatric Patient /Brain Death**
5. Intensive care (posting in PICU and lectures by Consultant PICU)
6. Monitoring of a comatose child
7. Coma in Pediatric population/ metabolic coma
8. Brain death
   1. **Neurological manifestations of systemic diseases**
9. metabolic encephalopathies
10. disorders of acid/base / electrolyte disturbances
11. neurological complications of pulmonary, gastrointestinal, hepatic, renal , cardiac, hematological, neoplastic and endocrine diseases
12. **Neurological and Neurosurgical emergencies**
    1. Department of Neurosurgery
    2. Neurological Emergencies
13. **Clinical Epidemiology**
14. research methodology
15. biostatistics
16. **Ethics in Medicine**
17. **Neuroinformatics**

Use of media in education, computer information and technology, internet

1. **Rehabilitation in Pediatric Neurology**

(a) principles of physiotherapy

(b)Assistive devices

(c)Treatment of spasticity

(d) Occupational therapy

1. **Community Pediatrics**
2. National Programmes
3. AFP surveillance
4. **Non epileptiform paroxysmal disorders and sleep disorders**

\*headache

\*breath holding spells

\*syncope

\* sleep disorders

1. **Neuroendocrine and autonomic nervous system disorders**
2. disorders of Hypothalamus & Pituitary gland in Childhood and Adolescence
3. disorders of micturition and defecation
4. disorders of autonomic nervous system
5. **Neuroimaging**

## LOG BOOK

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

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

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

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

**BOOK AND JOURNAL RECOMMENDATIONS**

**BOOKS FOR REFERENCE**

1. Swaiman’s Textbook of Neurology.
2. IAP Textbook of Pediatric Neurology.
3. Pediatric Clinics of North America (Pediatric Neurology)
4. Epilepsy in Children (IAP Textbook)

**JOURNALS FOR REFERENCE**

1. Developmental Medicine and Child Neurology – Mackeith Press London UK
2. Indian Pediatrics
3. Indian Journal of Practical Pediatrics
4. Neurology India
5. American Journal of Neurology