

Doctorate in Medicine in PEDIATRIC NEUROLOGY

PREAMBLE: Pediatric Neurology is a growing branch needing special attention. as it accounts for about 40-50% of all pediatric cases in the OPD, intensive care and wards. Pediatric neurology is distinct from adult cardiology and hence it needs specialized training. The spectrum of diseases, the manifestation of diseases and even the management strategies are different in paediatric population. While stroke, dementia, parkinson's disease form the majority of adult neurology OPD cases, mental retardation, epilepsy, neuroinfections, cerebral epilepsy, neurometabolic disorders form the majority in paediatric neurology OPD. Investigations commonly employed in paediatric neurology are MRI/ CT scan, EEG and neurometabolic work up. Even these also show age related changes. A MRI of 6 months old infant is very different from 3 year old child because of lack of myelination. A person seeing paediatric neurology patients should be well versed with these changes otherwise will lead to wrong interpretation of findings. Similarly in EEG, there are many findings which are normal in children but abnormal in adults, for example slowing, some sharp transients are normal in children and should not be given any significance unless they are persistent and repetitive.

Lastly, the training in paediatric neurology is very much lacking in our country. Paediatrics degree holders do not get adequate training in paediatric neurology during their three years or two years post graduate course and most centres giving training in neurology are mainly adult oriented. Thus patients of paediatric neurology are misdiagnosed and managed wrongly. There is very much need for trained paediatric neurologists in our country at present so that patients of paediatric neurology are correctly diagnosed and managed so as to prevent irreversible brain damage and counsel parents appropriately. Hence a curriculum on pediatric neurology comprising of basic sciences, approach to pediatric neurology cases, with hands on experience in clinical neurology, electrophysiology, neuroimaging, neurointensive care and neuro-rehabilitation is the need of the day for the better management of Pediatric neurology patients.

2. OBJECTIVE:

- a. The course should facilitate clinical assessment, diagnosis & management of neurological disorders in children, & the problems related to brain and peripheral nervous system.
- b. The course should facilitate the candidate to obtain hands on experience in pediatric electroencephalography, electromyography/nerve conductions the clinical ability and the skill to diagnose various neurology disorders in children.

1 ELIGIBILITY FOR ADMISSION :

- 1 M.D / DNB in Pediatrics

DURATION OF COURSE : 3 years

Selection of candidates will be as per the rules and regulations of KAHER University.

5 MEDIUM OF INSTRUCTION: English
ATTENDANCE : 80% attendance

Course Contents (Syllabus)

- **Essential Knowledge:**

Pediatric Neurological examination

CNS malformations

1. Neural tube defects
2. Approach to a child with large and small head
3. Hydrocephalus
4. Microcephaly
5. Craniosynostosis
6. Cerebral malformations

Neonatal Neurology

1. Neurological examination of newborn
2. Neonatal seizures
3. Management of hypoxic ischemic encephalopathy
4. Intracranial hemorrhage
5. Periventricular leukomalacia
6. Bacterial meningitis
7. Bilirubin encephalopathy

Seizure disorders and Epilepsy

1. Seizures and non-seizures
2. Provoked seizures and Acute symptomatic seizures
3. Febrile seizures
4. Classifications, evaluation and management of epilepsy
5. Newer drugs in epilepsy and other options – ketogenic diet and epilepsy surgery
6. Epileptic syndromes
7. Intractable epilepsy and epilepsy syndromes

8. Status epilepticus

CNS infections

1. Acute pyogenic meningitis
2. Chronic meningitis
3. Brain abscess
4. Acute encephalitis
5. Cerebral malaria
6. Acute febrile encephalopathy
7. Neurocysticercosis
8. HIV encephalopathy and CNS opportunistic infections in HIV
9. SSPE (Sub-acute Sclerosing Panencephalitis)
10. Congenital Infections

Development

1. Cerebral palsy
2. ADHD
3. Autism
4. Learning disability
5. Mental retardation
6. Botox treatment for spasticity
7. Development assessment
8. Early stimulation programme
9. Intellectual disability

Neurometabolic disorders

1. An Approach to Neurometabolic disorders
2. Aminoacidurias
3. Organic acidurias
4. Fatty acid oxidation defects
5. Urea cycle disorders
6. Neurotransmitter disorders

7. Lysosomal disorders
8. Mitochondrial disorders
9. Peroxisomal disorders
10. Special diet formulation for Neurometabolic disorders

Neurodegenerative disorders

1. White matter disorders
2. Gray matter disorders
3. Cerebellar disorders
4. Basal ganglia disorders

Stroke in young

Approach to dysmorphic child

Neuromuscular disorders

1. approach to the site of lesion
2. Approach to muscular dystrophy
3. Approach to a Floppy infant
4. Congenital myasthenia graves
5. Acute flaccid paralysis(AFP)

Neuroimaging and Neuroradiology

Headache in children

- **Essential Investigation and diagnostic procedures**

EEG

EMG

NCV

BERA

VEP

CT

MRI

LP

Muscle biopsy

Nerve biopsy

Procedural and Operative Skills *

* Graded responsibility in care of patients and operative work (Structured Training Schedule) for Fellowship

	Procedure	Category +			
		O	A	PA	PI
1	Lumbar puncture	2	2	5	5
2	Muscle biopsy	2	2	5	5
3	Nerve biopsy	2	2	1	1
4	Skin Biopsy	2	2	2	2
5	EEG	5	5	5	5
6	NCV	2	2	5	5
7	EMG	1	1	5	5
8	BERA	1	2	2	2
9	VEP	1	2	2	2
10	RNST	1	1	2	2
11	Neostigmine test	1	2	2	2
12	Forearm ischemic test	1	1	2	2

+ Key

O – Watches up and observes

A – Assisted a more senior Surgeon

PA – Performed procedure under the direct supervision of a senior specialist

PI – Performed independently

b. Teaching / Learning Activities:

1. Weekly Seminars/Journal club
2. Monthly Lectures by faculty
3. Research methodology
4. Electrophysiology lab management – performance and interpretation of EEG/NCV/EMG/VEP/BERA
5. One publication or two representations at State/National level.
6. Internal assessment every six months
7. Final certifying examinations (clinical & Practical) examiners-National Faculty)

c. (1). Participation in departmental activities:

1. Journal review meetings – Weekly once
2. Seminars-weekly once
3. Clinico Pathological Conferences- monthly once
4. Inter Departmental Meetings- weeklyonce
5. Community Work – Camps / field visits-monthly once
6. Clinical rounds- daily
7. Participation in Conferences / presentation of papers- once in 2-3 months
8. Any other- teaching to MD/DCH students

(2) Rotation and Posting in other departments (Duration and Learning requirements to be specified for a, b, & c):

1. Basic Medical Sciences related subjects-neuro radiology
2. Applied Subjects-electrophysiology
3. Allied Subjects-neurogenetics

Allied subjects

Pediatric Intensive care

1. Status epilepticus
2. Acute febrile encephalopathy

Neonatology

1. Neonatal neurological disorders

Genetics

1. Genetic causes of GDD and intellectual disability
2. Neurometabolic disorders
3. Lysosomal disorders
4. Neurodegenerative disorders
5. Genetic counseling

Pediatric orthopedics

1. Surgery of cerebral palsy
2. Surgery for neuromuscular disorders

Pediatric Surgery

1. Management of hydrocephalus
2. Management of MMC

Pediatric Dermatology

1. Neurocutaneous syndromes

Pediatric Pulmonology

Respiratory management of neuromuscular disorders

Pediatric Endocrinology

Management of neuro-endocrine management

(3) Orientation Programme:

Neuroradiology- interpretation of CT/MRI

Electro physiology- interpretation of EEG/NCV/EMG/BERA/VEP

(4) Training in Teaching Skills and Research Methodology:

Teaching how to perform clinical studies

One study should be performed during study period

d. Monitoring of Teaching / Learning activities:

(a) Methods, (b) Frequency (c) Schedules or Checklists, log books, diary

Daily clinical rounds/ patient management approach

By direct observation

Fellows should maintain log books and will be checked at the end of month

Fellows should maintain diary and should be able to refer books, journal about patient management

e. Scheme of Examination:

(a) Written, (b) Clinical: Number & Type of cases and (c) Viva-Voce

THEORY EXAMINATION – includes 4 theory papers 100 marks each.

- Two long essays(20 marks each)
- Remaining six short essays (10 marks each)

PRACTICAL EXAMINATION – 2 Cases – 100 marks each

VIVA VOCE – 200 marks

Total – 800 marks

The candidates enrolled for the fellowship program should complete a short term dissertation project and submit the same to the university prior to the university exams. The candidate should also present a paper/ poster at National/State Conference and produce evidence in the form of certificate received for the presentation.

Viva- Voce

= **200 Marks**

C) Maximum Marks

<i>Theory</i>	<i>Practical</i>	<i>Viva</i>	<i>Grand Total</i>
400	200	200	800

10. DECLARATION OF RESULTS :

a) Passing criteria:

50% marks in both theory and practical examination separately.

b) Declaration of Class:

50% and above pass, 65% and above First Class, 75% and above Distinction.

c) A candidate who fails will have to appear for reexamination in the following academic year without repeating the course or courses of instruction.

Recommended Books and Journals:

Books

1. Text book of pediatric Neurology- Swaiman-5th Edition
2. Text book of Child Neurology- Menke's
3. Clinical pediatric neurology- G M Fenichel
4. Pediatric Neuroradiology- Barkovich's
5. Practical pediatric neurology-Veena Kalra
6. Bickerstaff – Neurological examination
7. De Jong's –Neurological examination
8. De Myer's –Neurological examination
9. Neurological examination made easy- Geraint Fuller
10. Aicardi text book on Epilepsy
11. EEG interpretations- U K Mishra
12. Localization in clinical neurology-5th ed by Paul W. Brazis
13. Brain's diseased of the nervous system-Adam and victor neurology
14. Brett pediatric neurology
15. Avery's neonatal neurology

Journals

1. Pediatric neurology
2. The Journal of child neurology

3. Journal of pediatric neurology
4. Journal of pediatric Neurosciences
5. Developmental medicine and child Neurology
6. European journal of pediatric neurology
7. Brain and Development
8. Epilepsia
9. Neurology
10. Pediatrics
11. Lancet Neurology
12. Seizure
13. European neurology
14. Seminal in pediatric neurology
15. Seminars in Neurology
16. Clinics in neurology
17. Indian pediatrics
18. Indian Journal of Pediatric Neurology

Signature of the

Programme Co-ordinator

Place:

Date:

Signature of the

Head of the Institution