

# **IMPROVING THE KNOWLEDGE AND CAPACITY OF PAEDIATRIC NEUROLOGY FELLOWS IN ENUGU NIGERIA TO USE EEG FOR CARE OF CHILDREN WITH EPILEPSY IN ENUGU STATE NIGERIA.**

## **1. Why should this activity be supported right now?**

Epilepsy is the most prevalent chronic neurological disorder of childhood in the world and in Africa. The prevalence of epilepsy is 144 per 100,000 person-years in the first year of life and 58 per 100 000 for ages 1 to 10 years. (Aaberg 2017) In a door-to-door survey by Osakwe and colleagues (2014) in the Southeastern part of Nigeria, a prevalence of 20.8 per 1000 was documented. The high prevalence of epilepsy in African children has been related to factors such as poor obstetric care with consequent increased perinatal brain injury, poor neonatal care, and high levels of infection. An electroencephalogram (EEG) is a very essential tool in investigating the electrical activity of the brain. It is useful in differentiating true seizures from other seizure mimics. It also classifies seizures, assesses comatose patients, and evaluates encephalopathies. In summary, a neurologist may not be very effective without a basic knowledge of EEG.

Enugu State Nigeria has 4.7 million residents, and 29% of this population are children. There are 6 EEG machines in the state, and 5 neurologists (1paediatric and 2 adults in my hospital) who can read and interpret EEG. The high burden of childhood epilepsies in children requires that the few specialists in childhood neurology can read and interpret EEG also.

There are currently about 10 paediatric neurology residents/fellows in the state. The current training curriculum for neurology does not include training in EEG. The usual pattern is for fellows to travel outside the state and region and sometimes outside Nigeria to learn EEG. There is only 1 EEG training program in Nigeria, located in a different area. (I traveled to University Hospitals, Case Western University Cleveland, OH, USA for one year to learn EEG) This opportunity may not be available for everybody as there is no funding for it.

This proposed course would serve as a starter class to expose neurology fellows/residents to the basics of EEG and serve as a foundation for a proposed EEG course for residents in training to be included in the curriculum. This is intended altogether to be an 8-week course (split into 2 sessions of 4 weeks) that would help improve the capacity of neurology fellows in the use of EEG to manage their patients. Currently, I am the only person in my institution that can read EEG in the department of paediatrics. The other two paediatric neurologists are in different hospitals all far from my center. Anytime I'm on vacation, there is no mention or use of EEG in patient care, hence the need to train others in basic EEG –to identify artifacts, normal variants, and others like hypsarrhythmia, 3spike/per second patterns.

## **2. Proposed teaching methods**

This would be a 4-week workshop that would engage both didactic lectures and hands-on practicals (EEG reading).

Didactics - Faculty would give lectures on Epilepsy and EEG in the mornings. These would include Origins of EEG, Indications for EEG, EEG montages, artifacts, and different epileptic abnormalities in EEG. In the afternoons, there would be 2 hours of reading and review of 2 EEG assignments given the previous day.

Discussions - Audio-visually would be used to show different seizure semiology and their different EEG wave morphology during the afternoon sessions.

Participants would discuss the indications for EEG, EEG neurophysiology, and basic EEG technology, in the morning sessions, and different findings on EEG- epileptic /non epileptic, montages, and artifacts in the afternoon.

### **3. Target audience**

This would include a maximum of 5 paediatric neurology fellows in all training institutions in the state. Consultants who are interested in the EEG course would also be invited.

### **4. How to maximize interaction with the students.**

Interaction with the participants would be maximized by having a small learning group of a maximum 5 participants for this first edition of the course.

After 3 weeks, there would be a formative assessment of what the students understood so far.

Social media (WhatsApp) will be used to promote interaction before during and after the course. EEG tracings, questions, and clarifications would also be received and discussed from the platform. Lecture slides will be shared on the platform for further study.

There shall be opportunities to take questions, clarifications, and further explanations at the end of each lecture.

There would be daily assignments given which would be reviewed in the afternoon sessions.

At the end of each week, the best student from the daily assignments would be awarded a token.

### **Date & Venue**

The proposed dates for this workshop are November 4- 29th, 2024

The morning sessions (lectures and review of the previous day's assignment) of the course would be held in the Department of Paediatrics seminar room while the afternoon sessions would be

held in the EEG room, both in the University of Nigeria Teaching Hospital, Enugu Nigeria. It is located at the outskirts of Enugu city, Nigeria, and is the biggest hospital in south east region of Nigeria. The choice of the hospital is to ensure the availability and accessibility of the resource persons, EEG machine/facilities for hands-on, accessibility of the venue, availability of appropriate sized seminar room, and excellent service e.g. steady power supply.

The seminar room is a 30-person room and ensures both good sound management and adequate spacing.

The audio-visuals that would be used to enhance learning include a projector, white screen, microphone, laptop, etc.

Tea breaks would be served all the days of the workshop.

## 6. Budget

ITEM	UNIT PRICE(USD)	QUANTITY	TOTAL (USD)	REMARKS
Venue			500	This would be paid to the hospital for the venue for the duration of the course.
Workshop materials	50	5 participants	250	This would involve writing materials and printing out EEG tracings for the daily assignment.
Bursaries for transport	80	5 participants	400	5 participants would be given subsidies for transport fare at the end of the workshop
Tea break	3.75/person/day	6 Persons/day	450	The 5 participants and the faculty for the day would be served tea.

Stipend for course coordinator	200	1 person	200	One assistant would be engaged for assisting with the logistics of the workshop for 4 weeks duration.
Support for time out of work	200	4 faculty	800	Three neurologists and 1 EEG technician would be engaged for the whole duration days of the course. I would not be taking any support for time out of work.
Total			2600	

### **Has my support been guaranteed?**

I will put my funds of about 100 USD in the project.

### **Proposed funding from ILAE- 2600 USD**

**Bursaries**– 80 USD would be given to all the participants. This would be given to the participants to help subsidize the cost of transportation for the 4 weeks of the workshop. This will be given on the last day of the workshop.

### **Likely output-**

1. At the end of this first part of the course, the participants will be able to

Know when EEG is indicated in patient care.

Identify common artifacts like electrodes, eye movement, EMG, glossokinetic, etc

Identify normal EEG variants e.g. POSTs.

These would be assessed using pre and post-tests.

2. The WhatsApp platform (EEG STUDY) would be used to sustain the knowledge from the workshop as participants would be encouraged to post EEG tracings on the platform for discussions.
3. The contacts of the resource persons would be available for further engagements on EEG.
4. The resource person would also send their lectures to the course participants for further reference.

### **Sustainability**

This course will be the foundation for incorporating EEG/Epilepsy posting into the training curriculum of Neurology residency training. A proposal would be submitted to the National Postgraduate Medical College of Nigeria for a two-month posting in EEG. One month would be incorporated into the junior residency program and another into the senior residency curriculum.

Discussions have already been initiated for this introduction into the curriculum and this course would help accelerate its approval process.

### **References**

1. Aaberg, K., Gunnes, N., Bakken I., Sjøraas C., Berntsen A, et al .(2017) Incidence and prevalence of childhood epilepsy: a nationwide cohort study ; *Pediatrics*, 139 e20163908; DOI: 10.1542/peds.2016-3908.
2. Osakwe C, Otte WM, Alo C.(2014) Epilepsy prevalence, potential causes and social beliefs in Ebonyi State and Benue State, Nigeria. *Epilepsy research* 2014;**108**:316-26
3. Enugu state in Nigeria. [https://citypopulation.de/en/nigeria/admin/NGA014\\_enugu/1](https://citypopulation.de/en/nigeria/admin/NGA014_enugu/1).

### **SHORT BIOGRAPHIES OF FACILITATORS.**

**Adaobi I Bisi-Onyemaechi** received her medical degree from the University of Port Harcourt Nigeria where she graduated with excellent grades and was the 3rd best medical student and was subsequently awarded automatic internship in the University of Port Harcourt Teaching Hospital. She proceeded to her residency training program in Paediatrics and Child Health and became a fellow of the National Post Graduate Medical College of Nigeria with a distinguished Adeoye Adeniyi Prize for the best in research in clinical Paediatrics. She also obtained a Master's Degree in Public Health while doing her residency. She is an Associate Professor at the College of Medicine and an Honorary Consultant with the University of Nigeria Teaching Hospital Enugu, Nigeria. She has a Master's degree in Tropical Paediatrics (Neurology) and is currently doing her PhD in Child Neurology. She undertook a one-year research fellowship with the epilepsy unit,

Neurological Institute, University Hospitals Cleveland. She obtained a certificate diploma in Paediatric Nutrition from the Boston School of Medicine. She is also the Southeast Immunization Ambassador for the Paediatric Association of Nigeria. She has over 45 publications in different areas of Paediatrics and Child Health. She is a member of various committees in the faculty and currently the welfare secretary of the Medical and Dental Consultant Association, Enugu State.

**Ngozi C Ojinnaka** MBBS (Nig), MPH, FWACP (Paed) is a Professor of Paediatrics and Child Neurologist, College of Medicine, University of Nigeria, Enugu Campus and University of Nigeria Teaching Hospital Ituku-Ozalla, Enugu. Has practiced child Neurology for 33 years with special interest in childhood epilepsies. She has supervised thirty-one dissertations for the West African College of Physicians and the National Postgraduate Medical College of Nigeria in the faculty of paediatrics. She has also supervised Master's degree Thesis in Tropical Paediatrics.. She has over 60 publications (majorly in Child neurology) to her credit. Has mentored many young colleagues especially in Paediatrics. Has served as external examiner to several Nigerian universities and Department of Child Health, University of Ghana, Korle Bu Ghana. She undertook a training on EEG in Hospital for sick Children, Cape town, South Africa. Also attracted an EEG machine for the Neurology Unit, University of Nigeria Teaching Hospital Ituku-Ozalla, Enugu from TeleEEG, a registered charity in England and Wales. This is in use for clinical management of adult and children with epilepsy; teaching and research.

**Birinus Ezeala-Adikaibe**-MBBS, FWACP(Int. Med) is a professor of Internal Medicine at the College of Medicine, University of Nigeria, and a consultant Neurologist with the University of Nigeria Teaching Hospital Ituku- Ozalla. He has supervised many dissertations of the West African College of Physicians. He is the current president of the Nigerian League against Epilepsy and the Orient Neuroscience Society.

**Amarachukwu Okafor** MBBS, FMCPaed is a Consultant child neurologist at the Federal Medical Center Umuahia. She is the current head of Department of Paediatrics in her institution. She also did a one-year research fellowship with the epilepsy unit, Neurological Institute, University Hospitals Cleveland. She has also published many articles.

**Samson Anih** is a highly skilled EEG technologist of more than 10 years of experience. He is a chief technologist with the University of Nigeria Teaching Hospital, Enugu Nigeria.

DAY/Time	9-10	10-11	11-12	12-1	1-2:15
Venue	PAEDS SEMINAR ROOM	PAEDS SEMINAR ROOM	PAEDS SEMINAR ROOM	Lunch Break	CLINICAL MEASUREMENTS
<b>Week 1</b>					
Monday			EEG DISCUSSION		EEG READING
Tuesday	Registrations introduction	EEG Montages	EEG DISCUSSION		EEG READING
Wednesday	<b>PAEDS CLINICAL CONFERENCE</b>	EEG terminology, The 10-20 system	EEG DISCUSSION		EEG READING
Thursday	The normal EEG	EEG Artifacts	EEG DISCUSSION		EEG READING
Friday	EEG benign artifacts with Epileptiform features	Generalized Epileptiform abnormalities	EEG DISCUSSION		EEG READING
<b>Week 2</b>					
Monday			EEG DISCUSSION		EEG READING
Tuesday	Focal Epileptiform abnormalities.	ILAE Classification of seizures	EEG DISCUSSION		EEG READING
Wednesday	<b>PAEDS CLINICAL CONFERENCE</b>	Approach to a single seizure	EEG DISCUSSION		EEG READING
Thursday	Antiepileptic Medications	Combination therapy	EEG DISCUSSION		EEG READING
Friday	Paroxysmal Non-epileptic events in the newborn	Paroxysmal non-epileptic events in paediatrics	EEG DISCUSSION		EEG READING
<b>Week 3</b>					
Monday			EEG DISCUSSION		EEG READING

Tuesday	Paediatric epilepsy syndromes 1	Paediatric epilepsy syndromes 2	EEG DISCUSSION		EEG READING
Wednesday	PAEDS CLINICAL CONFERENCE	EEG in encephalopathy	EEG DISCUSSION		EEG READING
Thursday	Status Epilepticus	Non pharmacological treatment of Epilepsy	EEG DISCUSSION		EEG READING
Friday	PAEDS MORTALITY CONFERENCE	ASSESSMENT	EEG DISCUSSION		EEG READING
Week 4					
Monday			EEG DISCUSSION		EEG READING
Tuesday	Introduction to sleep.	Neurobiology of sleep	EEG DISCUSSION		EEG READING
Wednesday	PAEDS CLINICAL CONFERENCE	Epilepsy case study	EEG DISCUSSION		EEG READING
Thursday	REVISION	End of Course assessment	EEG DISCUSSION		EEG READING
Friday	PAEDS MORTALITY CONFERENCE	Review/Feedbacks	Prizes, Group Pictures		EEG READING