# Epilepsy

## *Executive summary*

## Introduction

Epilepsy is a chronic brain disorder characterized by a predilection to having afebrile epileptic seizures. Most epilepsy is of unknown cause (idiopathic epilepsy). Majority of people with epilepsy live in LMICs like The Gambia. Epilepsy can significantly impair quality of life and cause social stigma. Late presentation and poor adherence to treatment increases the risk of status epilepticus and sudden unexpected death in epilepsy.

This guideline covers the diagnoses and treatment of epilepsy and status epilepticus.

### Target users

* Nurses
* Doctors

### Target area of use

* Gate Clinic
* Outpatient Department
* Ward

### Key areas of focus / New additions / Changes

The diagnosis of epilepsy requires two *unprovoked* epileptic seizures occurring at least 24 hours apart or a single *unprovoked* epileptic seizure with an underlying predisposition to recurrence. Epileptic seizures are classified based on onset, awareness and symptoms. The type of seizures and other findings on clinical examination assist in the choice of drug therapy in epilepsy.

The diagnosis of epilepsy is clinical. EEG may assist in classifying seizure type. Other investigations may be requested to detect underlying causes or for monitoring patients on treatment.

The goal of treatment is no seizures and no side effects. Anticonvulsant monotherapy is preferred. Patients and their caregivers should be involved in decision-making to improve adherence to drugs and lifestyle measures prescribed.

Special situations discussed include status epilepticus, epilepsy in women of childbearing age including pregnancy, patients with first unprovoked seizure, and non-epileptic seizures.

### Limitations

EEG is not currently available in The Gambia.

## Presenting symptoms and signs

## An epileptic seizure is a transient motor, sensory or psychic manifestation that results from an abnormal paroxysmal electrical discharge in the brain. Presence of epileptic seizures does not necessarily imply epilepsy is present as many acute conditions can present with epileptic seizures as symptoms (acute symptomatic seizures). However, significant brain injury from these conditions may ultimately result in epilepsy (secondary or symptomatic epilepsy).

## Onset

* Seizures may be focal in onset (one side of the brain) or generalized (both sides of the brain).
  + Focal seizures may become secondarily generalized. This initial focal component may be missed if eye-witnesses or the patient are not specifically questioned. An “aura” preceding a generalized seizure is considered a focal seizure.

## Awareness

* In generalized seizures, the patient is unconscious or has complete loss of awareness.
* Focal seizures may present with intact awareness (‘focal aware seizure”, formerly called “simple partial seizure”) or with impaired awareness.

## Symptoms

Seizures may present as motor or non-motor symptoms

* Focal motor seizures may present as abnormal involuntary movements of the eyes, face, head or limbs;
* Focal non-motor seizures may present as abnormal sensations (strange odours, paraesthesia, abdominal pain) or as changes in cognition, emotions or behaviour.
* Generalized motor seizures are most commonly tonic-clonic but other forms including tonic, atonic, clonic and myoclonic seizures may occur alone or in combination.
* Generalized non-motor seizures usually present as absence seizures with brief episodes of loss of awareness. Automatisms may be present but are not considered motor seizures.

## Others

* Seizures may occur alone, as part of a recognizable epilepsy syndrome or as a component of a broader neurological disorder.
* Not all seizure-like activities are epileptic in nature; tics, tremors, spasms, non-epileptic myoclonus, syncope and psychogenic non-epileptic seizures among many other conditions may mimic epileptic seizures.
* History should include questions about
  + Symptoms
    - Warning signs (“aura’) before episode
    - Nature of activity during episode
    - Awareness during episode and ability to recall after episode
    - Patient’s state and time to full recovery after episode
    - Duration and frequency of episodes
    - Triggers
    - Response to any previous therapy
  + Prenatal, perinatal and developmental assessment.
  + History of severe illness or severe head trauma
  + Ongoing drug use (illicit drugs, anticonvulsants)
  + Consanguinity and family history of seizures.
* There is room for uncertainty when describing epilepsy in the absence of adequate information e.g generalized tonic-clonic epilepsy with *unknown onset*, focal epilepsy, *awareness unknown*.
* Eye-witness accounts and video recordings are very helpful in diagnosis.

## Examination findings

Examination of patients with epilepsy should asses cardiac and neurological function, including mental status. Examination of the skin may reveal abnormalities associated with some neurological syndromes. Patients with generalized epilepsy may show signs of past or recent trauma such as scars, bruises and lacerations.

## Management

**Diagnosis**

Diagnosis of epilepsy is based on clinical findings. Investigations may be carried out to detect underlying causes and to support the diagnosis where features are not typical.

Video EEG is the gold standard for classifying seizure types and detecting psychogenic non-epileptic seizures. It is expensive and unavailable in our setting.

Inter-ictal EEG can be done at Dakar, if necessary. Inter-ictal EEG alone should not be used to differentiate epileptic seizures from other diagnoses as false-positive findings can occur in persons without epilepsy.

CT scan or MRI can be requested if the patient has abnormal neurologic findings. MRI is available in Dakar and may be informative in patients with difficult-to-control focal-onset epilepsy. These tests should not be routinely requested for patients with a clinical diagnosis of idiopathic generalized epilepsy.

Lumbar puncture for CSF analysis is useful in patients with suspected meningitis, encephalitis, subarachnoid haemorrhage or prolonged alteration in consciousness.

Adults with suspected epilepsy should have a standard electrocardiogram done. Young adults and children may also have an ECG done if the diagnosis of epilepsy is uncertain.

Adults with epilepsy should do the following tests every 2 years:

* Full blood count
* Electrolytes, urea and creatinine,
* Liver function tests
* Serum calcium

**Treatment**

Patients with suspected epilepsy should be sent to the outpatient department for review by a doctor.

The goal of epilepsy treatment is to stop seizures completely without causing adverse effects from treatment (“no seizures, no side-effects”). Studies have shown that this can be achieved in up to 60% of patients. Up to 70% of patients remain seizure-free when medications are discontinued after 2 - 5 years of treatment.

To limit adverse events and drug interactions, treatment with a single appropriate anticonvulsant drug is preferred. Choosing this drug will require accurate classification of the type of epilepsy and assessing its suitability for the particular patient. Patients who remain uncontrolled on a single drug at maximum tolerated dose can have another appropriate drug added to the regimen. The new drug should be titrated to its maximum effective dose after which the old drug is tapered off gradually.

If the second drug is not helpful, any of the two drugs can be tapered off first and then a third drug started. If attempts at combination therapy are unhelpful, it is best to stay with the most effective regimen tolerated by the patient.

Lamotrigine and valproate are broad-spectrum anticonvulsants but are best reserved for generalized onset epilepsy. Valproate is notoriously teratogenic. It should be used by girls and women of childbearing age only if there is no alternative on the condition that they are counselled fully on the risk-benefit and the need for effective contraception. Valproate is significantly more expensive than carbamazepine. Lamotrigine is even more expensive.

Epilepsy in adults is most commonly focal in onset; this type of epilepsy generally responds to carbamazepine. Myoclonic seizures and absence seizures may be worsened by carbamazepine and should be treated with valproate.

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| **Epilepsy Syndrome** | **First Line** | **Alternative / Adjunctive** |
| Focal | Carbamazepine | Lamotrigine  Sodium valproate |
| Generalized tonic-clonic | Sodium valproate | Lamotrigine  Carbamazepine |
| Unclassified | Sodium valproate | Lamotrigine |
| Absence | Ethosuximide (not readily available),  Sodium valproate | Lamotrigine |
| Myoclonic | Sodium valproate |  |
| Atonic or Tonic | Sodium valproate |  |
| Infantile spasms | Vigabatrin (not readily available),  ACTH (not readily available),  Prednisolone |  |

Discuss the nature of the diagnosis and treatment with patient and caregivers. Lifestyle modifications and restrictions should be discussed including hazards such as using dangerous equipment, driving, working at heights, cooking over open flames and swimming. Drug adherence and the risks associated with sudden drug discontinuation should be emphasized.

If the patient is seizure-free for 2 to 5 years, drug therapy can be tapered off over a 3-month period at least. For patients on multiple drugs, discontinue one drug at a time. The risks of drug discontinuation including the possibility of relapse should be discussed and a clear plan agreed on with the patient.

**Special Situations**

**Status Epilepticus:**

Generalized convulsive status epilepticus is a life-threatening emergency. The typical patient with status epilepticus is one who suddenly discontinued anti-epileptic medications. Structural and metabolic disturbances can also lead to status epilepticus.

Generalized convulsive status epilepticus is diagnosed when:

* A generalized tonic-clonic seizure lasts for more than 5 minutes (Note that this period is for active fitting only and does not include the post-ictal phase of sleep or confusion), **or**
* A patient has a second generalized tonic-clonic seizure without recovering fully from the first seizure.

***Treatment:***

*1st stage (0−10 minutes)*

* Secure airway and resuscitate
* Administer oxygen
* Assess cardiorespiratory function
* Establish intravenous access
* Administer glucose (50 ml of 50% solution) in adults (with intravenous thiamine 100 mg if there is any feature suggestive of alcoholism or malnutrition).
* Call the doctor on call

*2nd stage (0−30 minutes)*

Commence regular monitoring of vital signs

Send samples for emergency investigations

Consider the possibility of non-epileptic seizures

Emergency anticonvulsant therapy with IV diazepam

* Give 0.15 mg/kg of IV diazepam over 5 minutes or 0.5 mg/kg PR (draw up the iv solution and use the syringe without an attached needle to deliver the drug PR).

Give usual anti-epileptic medication via NG tube if already on treatment for epilepsy.

Continue emergency anticonvulsant therapy with :

* Phenytoin infusion at a dose of 20 mg/kg at a rate of 50 mg/minute (do NOT mix with dextrose-containing infusion; use normal saline).

OR

* IV phenobarbital bolus of 15 mg/kg at a rate of 100 mg/minute if phenytoin is unavailable.

Urethral catheterization

*3rd stage (0−60 minutes)*

Identify aetiology of status epilepticus and treat medical complications.

If seizures persist 20 minutes after initial phenytoin infusion, give additional 10 mg/kg of phenytoin infusion.

*4th stage (30−90 minutes)*

If still in status epilepticus 20 minutes after second phenytoin infusion, give IV phenobarbital at 15 mg/kg.

*Emergency investigations*

* Blood glucose
* Urinalysis
* Serum electrolytes, urea and creatinine
* Liver function tests
* Serum calcium and magnesium
* Full blood count
* Clotting profile
* Chest radiograph may be needed to check for possible aspiration.
* Blood culture (if clinically indicated)
* Cranial CT Scan (if clinically indicated)
* Lumbar puncture for CSF analysis (if clinically indicated)

Ideally, patients should have continuous EEG monitoring, toxicologic screening, arterial blood gases and assay of anticonvulsant levels performed but these are not presently feasible.

**Girls and women of child bearing age:**

Many anticonvulsant drugs reduce the effectiveness of oral contraceptive pills. Other forms of contraception should be recommended.

Girls and women of childbearing age on treatment for epilepsy should be prescribed 5 mg of folic acid daily.

Anticonvulsant medications should not be switched during pregnancy even when the mother is on sodium valproate. Switching drugs increases the risks to both the mother and her fetus. Pregnant patients with epilepsy should be referred to the obstetrician early in the antenatal period.

**Patient with first unprovoked first seizure:**

Although the risk of development of epilepsy is higher in persons who have had a first unprovoked seizure, it is recommended that anti-epileptic drugs be withheld until a second unprovoked seizure occurs.

**Non-epileptic seizures:**

Some patients with psychological or psychiatric problems may present with non-epileptic seizures (pseudoseizures, psychogenic seizures). Other patients may produce seizure-like movements either subconsciously (factitious disorder) or intentionally (malingering).

Some of these patients actually have an underlying epilepsy syndrome while others may have been misdiagnosed and wrongly placed on epilepsy treatment.

It is difficult to differentiate non-epileptic seizures from true seizures without video-EEG monitoring. However, presence of severe tongue biting, an ictal cry and incontinence makes non-epileptic seizures unlikely.

The following features are not definitive but suggest a non-epileptic seizure especially when they occur together:

* Eyes closed during seizure and resistance to passive eye-opening by examiner
* Patient’s hand fails to fall on face when dropped over the head
* Side-to-side head movements during seizure
* Pelvic thrusts during seizure
* Seizures occurring with audiences (consulting room, waiting room, ward rounds)

Patients with suspected non-epileptic seizures should do an EEG and undergo psychological evaluation. Maintain their current therapy status until reviewed.

## Key Issues for Nursing care

## Monitor closely and document seizures which may be subtle (e.g lip twitching)

## Monitor and document vital signs, fluids and level of consciousness

* Nurse patients having generalized seizures in left lateral position with bed rails raised up.
* Do not force any object between the teeth during a seizure

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