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# A COMPLETE EVALUATION OF EPILEPSY CONDITION

**Beera Anoosha*, Eeda Siri Chandana[1], Machavaram Priyanka[1], Madagoni Sai Charan[1] and Sana Firdouse[1]**

[*]Pharm D, Assistant Professor, Department of Clinical Pharmacy, Vaageswari College of Pharmacy, Karimnagar, Telangana.
[1]Pharm D, Department of Clinical Pharmacy, Vaageswari College of Pharmacy, Karimnagar, Telangana.

***Corresponding Author: Beera Anoosha**
Pharm D, Assistant Professor, Department of Clinical Pharmacy, Vaageswari College of Pharmacy, Karimnagar, Telangana.

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## ABSTRACT
Epilepsy is one of the most common, widespread, and chronic neurological disorders that are best viewed as a symptom of disturbed electrical discharges from millions of neurons in the brain perhaps resulting from abnormal reverberating circuits. Epilepsy is also defined by the occurrence of at least two or more seizures that are unprovoked & separated by 24 hours. A seizure is a single, Transient Occurrence Of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain (These signs/symptoms may include altered actions of consciousness, motor, sensory, autonomic, or psychic events). Convulsive seizures mean sudden attacks of uncontrolled involuntary muscular contractions. It occurs due to paroxysmal uncontrolled discharges of impulses from neurons of the brain.

**KEYWORDS:** Epilepsy, Convulsions, Seizures, Neuronal activity, Electrical discharges.

## INTRODUCTION
**"Epilepsy"** is a neurological disorder characterized by abnormal electrical discharges from the brain's millions of neurons and it is characterized by recurrent seizures of at least two or more seizure attacks that are unprovoked and separated by 24 hours, it is also crucial to understand that epilepsy seizures can be just one [although the most obvious] symptom of an epileptic disorder. "**Seizures"** are distinguished by a single and transient occurrence of signs and/or symptoms due to an overabundance of the brain's cortical neuron activity, discharged in a hypersynchronous manner. There may also be disruptions in sensory-motor systems, consciousness, objective behavior, and subjective well-being; seizures are usually brief, having a beginning and an end, and might result in post-seizure disability. Uncontrolled involuntary muscle contractions are referred to as **"Convulsions."** The term "convulsive seizure" refers to a quick onset of uncontrollable involuntary muscle spasms caused by the paroxysmal uncontrolled firing of impulses from brain neurons.

### Epidemiology
Seizures have a major and frustrating impact on patients' lives, accounting for a large amount of the world's illness burden, impacting roughly 50 million people globally. At any given time, the proportion of the general population with active epilepsy is believed to be between 4 and 10 people per 1000. Globally, an estimated 5 million people are diagnosed with epilepsy each year. In high-income countries, there are estimated to be 49 per 100,000 people, in low and middle-income countries, the figure can be as high as 139 per 100,000.

### Etiology
Birth trauma, inherited factors, unexplained metabolic problems, Infectious diseases, Congenital disease, Lipid storage disorders, Intracranial neoplasms, Drug or alcohol withdrawal, and High fever in children. Metabolic disorders include hypocalcemia and hypoglycemia, Head trauma, and Developmental abnormalities.

### Classification

| Partial seizures | Generalized seizures | Unclassified seizures | Status epilepticus |
|---|---|---|---|
| Simple partial seizures<br>Partial seizures<br>Complex partial seizures | Atypical absence seizures<br>True absence seizures [petit mal]<br>Tonic seizures<br>Clonic seizures<br>Tonic-clonic seizures [Grand mal]<br>Myoclonic seizures<br>Atonic seizures | Neonatal seizures<br>Infantile spasms | Generalized convulsive status epilepticus [GCSE]<br>Nonconvulsive status epilepticus [NCSE]. |

**Clinical presentation**

| | |
|---|---|
| **(I) PARTIAL SEIZURES** | |
| **1) Simple partial seizures** | a) Behavioural manifestations: Deja vu experiences, structured hallucinations, impaired consciousness, and dysphagia<br>b) Motor symptoms: Chewing motions, convulsive jerking, and lip-smacking<br>c) Sensory symptoms & somatosensory manifestations: Auras and paraesthesia<br>d) Autonomic symptoms: Flushing, sweating, and pupil dilation |
| **2) Complex partial seizures** | a) Automatism is common & may follow auditory, visual, or olfactory hallucinations<br>b) Purposeless behavior<br>c) Postictal confusion usually continues for 1-2 mins after the seizure ends<br>d) Psychomotor [temporal lobe] epilepsy leads to aggressive behavior (E.g., violence or outbursts of rage)<br>e) The affected person may wander about aimlessly, may have a glassy stare, and may speak unintelligibly |
| **(II) GENERALIZED SEIZURES** | |
| **1) Absence of seizures (petit mal)** | a) Alterations of consciousness [absences] last for 10-30 sec<br>b) Autonomic components and enuresis may occur<br>c) Occasional eye blinking [staring] and reduction or loss in postural tone<br>d) Onset of seizures mainly occurs from age 3-16 years; in most patients, absence seizures disappear by the age of 40<br>e) Some patients may experience 100 or more seizure attacks daily |
| **2) Tonic seizures** | Involves sustained tonic muscle extension [stiffening] |
| **3) Clonic seizures** | Involves sustained muscle contractions alternating with relaxation |
| **4) Tonic-clonic seizures (Grand mal)** | a) Sudden loss of consciousness<br>b) Patient becomes rigid & falls to the ground; contraction of the diaphragm may induce grunting; the legs get extended, and the back arches; respirations will be interrupted<br>c) The clonic phase will be followed by muscle flaccidity, hyperventilation, and rapid bilateral muscle jerking. Sometimes, tachycardia, incontinence, heavy salivation, and tongue biting also occur<br>d) In the postictal phase, the patient may experience confusion, drowsiness, muscle soreness, headache, nausea, and disorientation.<br>e) Some individuals have serial grand mal seizures, regaining consciousness temporarily between attacks. In some cases, grand mal seizures are repeated with no recovery of consciousness between attacks |
| **5) Myoclonic seizures** | Involuntary jerking of limbs, or trunk muscles, and facial muscles are seen in a rhythmic manner |
| **6) Atonic seizures** | A sudden loss of postural tone is seen so that the individual falls to the ground. Mainly, this type occurs in children |

## TREATMENT

### NONPHARMACOLOGICAL TREATMENT

Nonpharmacological therapy for epilepsy includes diet, surgery, and vagus nerve stimulation. A vagal nerve stimulator is a medical device that is approved by the Food and Drug Administration [FDA] as an alternative therapy for reducing the attack of seizures in adults and adolescents older than 12 years of age with partial-onset of seizures that are refractory to antiepileptic drugs. The mechanisms of anti-seizure actions of vagal nerve stimulators are unknown. The vagal nerve stimulator is safe. It also has a positive effect on mood and behavior. Some side effects related to vagal nerve stimulators are hoarseness, voice alteration, increased cough, pharyngitis, dyspnoea, dyspepsia, and nausea. Surgery is also the treatment option for patients with refractory focal epilepsy. Surgery decreases the risk of epilepsy relate to death, it may also better the depression and anxiety in patients with refractory epilepsy. The ketogenic diet plan started in the 1920s is high fat-containing food and low carbohydrate and protein-containing food and sometimes it results in acidosis and ketosis. It requires strict control. It is poorly tolerated by patients. However, the control of seizures by the ketogenic diet is accurately unknown.

**PHARMACOLOGICAL TREATMENT:** The management of epilepsy requires that antiepileptic drug treatment be distinguished:

| **DRUG THERAPY** | | | | |
|---|---|---|---|---|
| **Type of seizure** | **1st choice** | **2nd choice** | **3rd choice** | **4th choice** |
| Simple partial | Carbamazepine (alone or in combination) | Phenytoin | Lamotrigine<br>Lacosamide<br>Oxcarbazepine<br>Primidone | Gabapentin<br>Tiagabine<br>Levetiracetam<br>Zonisamide |
| Complex partial | Lamotrigine, Carbamazepine | Phenytoin | Oxcarbazepine<br>Phenobarbital<br>Zonisamide | Primidone<br>Tiagabine<br>Topiramate<br>Vigabatrin<br>Valproic acid |
| Primary generalized tonic-clonic | Valproic acid, Lamotrigine | Carbamazepine | Phenytoin, Valproic acid | Phenobarbital<br>Tiagabine<br>Topiramate |
| Absence | Ethosuximide, Lamotrigine | Valproic acid, Zonisamide | | |
| Myoclonic atonic | Valproic acid | Clonazepam | Zonisamide | Felbamate (alone or in combination) |
| Status epilepticus | Diazepam | Phenytoin | Phenobarbital | |

## CONCLUSION

Epilepsy is a progressive neurological disorder with no permanent cure with high morbidity and mortality that occurs commonly in the general population. Certain lifestyle modifications like having well knowledge of the condition, seeking help from health care professionals, regular medication, regular hospital visits, and dietary adjustments will be helpful in achieving good outcomes in the patients.

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