

The Causes, Symptoms, And Treatments Of Epilepsy

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Epilepsy is a neurological disorder characterized by an enduring predisposition to recurrent unprovoked seizures. A seizure is a temporary episode caused by abnormal, excessive, or synchronized electrical activity in the brain. Having one seizure does not always mean that a person has epilepsy. Diagnosis depends on the circumstances, recurrence risk, clinical history, electroencephalography, imaging, and other evidence. The original essay correctly identifies several seizure types, possible causes, and treatment approaches, but it sometimes treats epilepsy as a single condition and uses older terminology. Modern classification distinguishes focal, generalized, and unknown-onset seizures and recognizes many different epilepsy syndromes. (World Health Organization, 2024)

Causes of Epilepsy

Epilepsy can arise from several categories of causes, including structural brain abnormalities, genetic factors, infections, metabolic disorders, immune conditions, and unknown causes. Structural causes include stroke, traumatic brain injury, brain tumors, developmental malformations, and damage related to complications around birth. Some epilepsies are strongly genetic, while others involve complex interactions among many genes and environmental factors. Infections such as neurocysticercosis, meningitis, or encephalitis can also lead to epilepsy, particularly in regions where these diseases are common. In many people, no single cause can be established despite appropriate evaluation. (World Health Organization, 2024)

Risk Factors

Risk factors include significant head injury, stroke, central nervous system infection, family history of some epilepsy syndromes, developmental disorders, and certain congenital brain abnormalities. Age also influences risk: epilepsy is common in childhood and rises again among older adults because of stroke and neurodegenerative disease. A risk factor does not mean that seizures are inevitable. Many people exposed to head injury or infection never develop epilepsy, while some people develop the disorder without a recognized risk factor. (World Health Organization, 2024)

Seizure Classification

Focal-onset seizures begin in networks limited to one hemisphere. Awareness may be preserved or impaired, and symptoms can include movement, sensory experiences, emotional changes, autonomic symptoms, or unusual behavior. A focal seizure can spread to both sides of the brain and become a bilateral tonic-clonic seizure. Generalized-onset seizures involve networks on both sides from the beginning and include absence, tonic-clonic, myoclonic, tonic, clonic, atonic, and other types. Correct classification helps guide medication choice and prognosis. (American Epilepsy Society, n.d.; Kanner, 2020)

Tonic-Clonic Seizures

A generalized tonic-clonic seizure commonly begins with loss of consciousness and stiffening of the body during the tonic phase, followed by rhythmic jerking during the clonic phase. Breathing may become irregular, saliva can accumulate, and the person may bite the tongue or lose bladder control. After the seizure, confusion, headache, fatigue, or muscle soreness can occur. Not every convulsive event is epilepsy, and medical evaluation is required to distinguish epileptic seizures from fainting, metabolic disturbances, cardiac events, and psychogenic nonepileptic seizures. (American Epilepsy Society, n.d.)

Absence Seizures

Absence seizures usually involve brief episodes of impaired awareness, often lasting only seconds. A child may suddenly stop speaking or moving, stare, and then resume activity without remembering the interruption. Because episodes can occur many times a day, they may be mistaken for inattention or daydreaming. Electroencephalography can show characteristic patterns in typical absence epilepsy. Absence seizures require different treatment considerations from focal impaired-awareness seizures, even though both may involve periods of reduced responsiveness. (Kanner, 2020)

Focal Impaired-Awareness Seizures

Focal impaired-awareness seizures, previously called complex partial seizures, can include staring, confusion, repetitive movements such as lip smacking or picking at clothing, and inability to respond normally. Some people experience an aura beforehand, which is itself a focal aware seizure. Recovery may include several minutes of confusion. Temporal-lobe epilepsy is one common cause, but focal seizures can originate elsewhere. The description of symptoms should be obtained from both the patient and witnesses because the person may not remember the episode. (Kanner, 2020)

Triggers Versus Causes

Sleep deprivation, missed medication, alcohol withdrawal, illness, stress, and flashing lights can trigger seizures in susceptible people, but triggers should not be confused with the underlying cause of epilepsy. Photosensitive epilepsy affects only a minority of patients. Stress is commonly reported as a trigger, yet the relationship is complex and individual. Avoiding known triggers can help reduce risk, but lifestyle changes do not replace prescribed treatment when medication is indicated.

(American Epilepsy Society, n.d.)

Diagnosis

Diagnosis begins with a detailed account of the event: what happened before, during, and after; duration; injuries; awareness; movement; medical history; medications; substance use; sleep; and family history. Electroencephalography can detect epileptiform activity but may be normal between seizures, so a normal EEG does not exclude epilepsy. MRI can identify structural abnormalities. Blood tests may identify metabolic or infectious causes, and cardiac evaluation may be needed when fainting is possible. Video-EEG monitoring can help distinguish epilepsy from nonepileptic events when the diagnosis remains uncertain. (American Epilepsy Society, n.d.; Kanner, 2020)

Antiseizure Medication

Antiseizure medicines are the main treatment for most patients. Drug selection depends on seizure type, epilepsy syndrome, age, sex, pregnancy potential, other medical conditions, drug interactions, adverse-effect profile, and cost. Examples include levetiracetam, lamotrigine, valproate, carbamazepine, oxcarbazepine, lacosamide, topiramate, and many others. A medicine effective for one seizure type may worsen another, which is why classification matters. Patients should not stop medication suddenly without medical advice because withdrawal can provoke seizures or status epilepticus. (Kanner, 2020)

Medication Adverse Effects and Monitoring

Possible adverse effects range from fatigue and dizziness to mood changes, skin reactions, blood abnormalities, liver injury, metabolic effects, or reproductive risks depending on the drug. Valproate requires particular caution in people who may become pregnant because prenatal exposure is associated with major congenital malformations and neurodevelopmental harm. Clinicians should review interactions with contraception and other medicines, monitor when indicated, and discuss risks in understandable terms. Treatment aims for seizure freedom without unacceptable adverse effects rather than simply increasing medication until all electrical activity is suppressed. (Kanner, 2020)

Drug-Resistant Epilepsy

Some patients continue to have seizures despite appropriate trials of antiseizure medications. Drug-resistant epilepsy is generally considered when two adequately chosen and tolerated treatment schedules fail to produce sustained seizure freedom. Such patients should be referred to an epilepsy center because additional evaluation may identify a surgically treatable focus or other options. Continued repeated medication changes without specialist assessment can delay effective treatment. (American Epilepsy Society, n.d.)

Epilepsy Surgery

Surgery can be highly effective when seizures arise consistently from a brain region that can be removed or disconnected without unacceptable functional loss. Temporal-lobe surgery is one established example. Evaluation may include high-resolution MRI, prolonged video-EEG, neuropsychological testing, functional imaging, language mapping, and sometimes invasive electrodes. Surgery is not a last-resort punishment after decades of disease; appropriately selected patients with drug-resistant focal epilepsy may benefit from early specialist referral. (American Epilepsy Society, n.d.)

Neuromodulation

When resection is not possible, devices can reduce seizure frequency in selected patients. Vagus nerve stimulation sends intermittent electrical signals through the vagus nerve. Responsive neurostimulation detects abnormal activity and delivers stimulation to targeted brain regions, while deep brain stimulation can modulate seizure networks. These therapies usually reduce rather than completely eliminate seizures and require ongoing follow-up. (American Epilepsy Society, n.d.)

Dietary Therapy

The ketogenic diet and related high-fat, low-carbohydrate dietary therapies can reduce seizures in some children and adults, particularly in selected drug-resistant epilepsies. These diets require clinical and dietetic supervision because they can affect growth, kidney stones, lipids, bone health, gastrointestinal function, and nutritional adequacy. They should not be attempted casually from internet instructions. (American Epilepsy Society, n.d.)

Status Epilepticus

Status epilepticus is a medical emergency involving a prolonged seizure or repeated seizures without adequate recovery. A convulsive seizure lasting five minutes or more should generally trigger emergency action according to the person's seizure plan and local emergency guidance. Prolonged seizures can cause injury, respiratory compromise, and neuronal damage. Rescue medicines such as benzodiazepines may be prescribed for patients at risk. Families and caregivers should know exactly when and how to use them. (American Epilepsy Society, n.d.)

First Aid

During a convulsive seizure, bystanders should protect the person from nearby hazards, cushion the head, loosen restrictive clothing, and turn the person on the side when possible. They should time the seizure and remain nearby until recovery. Nothing should be forced into the mouth; a person cannot swallow the tongue, and inserting objects can cause injury. Restraint should be avoided. Emergency services are appropriate when the seizure is prolonged, repeats without recovery, occurs in water, causes serious injury, affects breathing, occurs during pregnancy, or is a first known seizure. (American Epilepsy Society, n.d.)

Safety and Daily Life

Epilepsy can affect driving, employment, bathing, swimming, heights, machinery, sleep, and pregnancy planning. Restrictions should be based on actual seizure risk and law rather than stigma. Driving regulations vary by jurisdiction and often require a seizure-free interval. People with uncontrolled seizures may need showers instead of unsupervised baths, safety precautions around heat or heights, and individualized work planning. The goal is reasonable risk reduction while preserving independence and participation. (World Health Organization, 2024)

Pregnancy and Reproductive Health

Most people with epilepsy can have healthy pregnancies, but planning is important. Some antiseizure medicines carry greater fetal risk, and pregnancy changes drug levels. Folic acid, medication review, seizure control, and coordinated neurologic and obstetric care should begin before conception when possible. Abruptly stopping medication can endanger both parent and fetus. Clinicians should also discuss contraception because some antiseizure drugs reduce hormonal contraceptive effectiveness and some hormonal methods alter antiseizure drug levels. (Kanner, 2020)

Mental Health

Depression and anxiety are common among people with epilepsy and can arise from neurobiology, treatment effects, social isolation, unpredictability, and stigma. Suicide risk is also elevated in some groups. Mental-health screening should therefore be part of routine care. Mood changes after starting or changing medication deserve attention. Psychological support can improve quality of life even when seizure control remains imperfect. (Kanner, 2020)

Sudden Unexpected Death in Epilepsy

Sudden unexpected death in epilepsy, or SUDEP, is a rare but serious risk, especially among people with uncontrolled generalized tonic-clonic seizures. The exact mechanisms are not fully understood and may involve respiratory and cardiac changes after seizures. The strongest modifiable protection is good seizure control and medication adherence. Patients and families should receive accurate, sensitive information rather than either alarming or withholding the risk. (American Epilepsy Society, n.d.)

Stigma and Global Treatment Gaps

Epilepsy has historically been associated with myths, discrimination, and social exclusion. In some communities, people are denied education, employment, marriage, or participation despite being capable. WHO reports that a large proportion of people with epilepsy in low- and middle-income countries do not receive adequate treatment, even though many could become seizure-free with appropriate diagnosis and affordable medicines. Improving primary-care training and reliable medicine supply can close much of this gap. (World Health Organization, 2024)

Prognosis

Prognosis varies. Many people achieve long-term seizure freedom with medication, while others have chronic drug-resistant disease. Some childhood syndromes remit with age, while structural or genetic epilepsies may persist. Decisions about withdrawing medication require individualized evaluation of seizure type, EEG findings, cause, duration of seizure freedom, risks of recurrence, driving, occupation, and patient preference. (Kanner, 2020)

Conclusion

Epilepsy is not one uniform disease but a group of disorders characterized by an enduring tendency toward seizures. Causes include genetic, structural, infectious, metabolic, immune, and unknown

factors. Diagnosis requires careful clinical history and may use EEG, MRI, laboratory testing, and prolonged monitoring. Most patients are treated with antiseizure medication, while surgery, dietary therapy, or neuromodulation can help selected people with resistant disease. First aid, safety planning, pregnancy care, mental-health support, and SUDEP counseling are also important. The most damaging misconceptions are that every seizure is epilepsy, that objects should be placed in the mouth during a convulsion, or that people with epilepsy cannot lead independent lives. With accurate diagnosis and appropriate treatment, many people can achieve good seizure control and full participation in education, work, and family life. (American Epilepsy Society, n.d.; Kanner, 2020; World Health Organization, 2024)

Works Cited

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