

# Epilepsy

## Fact Sheet

### What is Epilepsy?

Epilepsy is a chronic brain disorder characterized by recurrent, unprovoked seizures, or periods of unusual behavior, sensations, and sometimes loss of awareness. A seizure is a sudden rush of electrical activity in the brain that temporarily affects how it works. A person is diagnosed with epilepsy if they have two unprovoked seizures that were not caused by some known and reversible medical condition, a single seizure with a high probability of seizure recurrence, or diagnosis of an epilepsy syndrome.

About 5–10% of people will have an unprovoked seizure by the age of 80<sup>1</sup>, and the chance of experiencing a second seizure is between 40% and 50%. It's often lifelong but can sometimes get slowly better over time.

### Key facts



Epilepsy is a fairly common neurological disorder that affects **65 million** people around the world.<sup>2</sup>



Anyone can develop epilepsy at any time of life with no distinction of age, race and social classes, but it is most commonly diagnosed in **children** and in **people over 65**.



It occurs slightly more in **males** than in females.

# History

The world's oldest description of an epileptic seizure comes from a text in Akkadian written around 2000 BC and it was even listed in the Code of Hammurabi (c. 1790 BC) . For a long time, epilepsy has been associated with the world of magic and the supernatural. The ancient Greeks thought of epilepsy as a form of spiritual possession, but also associated the condition with genius and the divine, giving it the name sacred disease . Hippocrates was the first one to refuse this view of the disease proposing that epilepsy was a medically treatable problem originating in the brain. Despite his work detailing the physical origins of the disease, evil spirits continued to be blamed until at least the 17th century. We had to wait until mid-1800s to see the introduction of bromide, the first effective anti-seizure medication<sup>3</sup>. The first modern treatment (phenobarbital) was developed in 1912.

## Known causes of Epilepsy

In a person with epilepsy, the electrical signals in the brain occasionally fire in a sustained or synchronous way and these sudden bursts of electrical activity are what cause a seizure<sup>4</sup>. The seizures in epilepsy may be related to a brain injury, infection or a genetic factor, but for 6 out of 10 people with epilepsy, the cause is completely unknown<sup>5</sup>. Different epilepsies are due to many different underlying causes and conditions may be traced to various factors, including<sup>6</sup>:



### Genetic influence

Some types of epilepsy, with no known cause, run in families, as around 1 in 3 people with epilepsy have a family member with it. While the general population there's a 1% chance of developing epilepsy before 20 years of age, having a parent whose epilepsy is linked to genetics, increases the risk from 2% to 5%<sup>7</sup>. In these cases, genetics is believed to be involved, either directly or indirectly<sup>8</sup>. Mutations or variations in one or more genes may be the cause of epilepsy. These genes are usually important for how the brain works. The relationship between genes and seizures can be very complex and genetic testing is not available yet for many forms of epilepsy.



### Brain condition

Brain conditions that cause damage to the brain - such as brain tumors or strokes - can cause epilepsy. Stroke is a leading cause of epilepsy in adults older than age 35.



### Head trauma

Between 6% and 20% of epilepsy is believed to be due to head trauma or a traumatic injury. Mild brain injury and severe brain injury increase the risk between two-fold and seven-fold.



### Developmental disorders

Epilepsy can sometimes be associated with developmental disorders, such as neurofibromatosis (NF1), a genetic condition that can cause growths on the nerves. Epilepsy is seen in about 4% to 7% of patients with NF1. Different seizure types and syndromes have been described in NF1, such as generalized onset seizures, focal onset seizures with and without secondary generalization. Many other neurodevelopmental conditions have high rates of epilepsy, including Rett syndrome.



### Infectious diseases

Infectious diseases, such as meningitis, AIDS and viral encephalitis, can cause epilepsy. The risk of epilepsy following meningitis is less than 10%.



### Autoimmune

A small but significant number of cases of new onset epilepsy have been traced to autoimmune conditions, where a person's own immune system launches an attack against one of its own proteins.

# Diagnosis

The treatment of seizures depends on an accurate diagnosis, so knowing what kind of epilepsy the person has is crucial. What happens during a seizure is one of the most important observations to report to a doctor, who (usually) is not able to witness the episode. A diary to keep track of all seizures and their details is crucial.

There are several tests to diagnose epilepsy and determine the cause of seizures:

## EEG

Epilepsy can often be confirmed with an electroencephalogram (EEG). EEG is an important test for diagnosing epilepsy because it shows patterns of normal or abnormal electrical activity in the brain. However, it can be the case that a normal test does not rule out the condition as some abnormal patterns may occur with several different conditions, not just epilepsy.

## MRI Scan

Magnetic resonance imaging (MRI) is a type of scan that uses powerful magnets and radio waves to create detailed pictures of almost any part of the body, including the brain. An MRI scan looks at the structure of the brain and may help to find the cause of your epilepsy detecting lesions or abnormalities in your brain that could be causing your seizures.

## CT Scan

Some people may have a CT scan instead of the MRI scan, because they might have a heart pacemaker, or if information about what might be causing their seizures is needed quickly. A computerized tomography scan (CT or CAT scan) uses computers and X-ray rays to create cross-sectional images of the brain, revealing abnormalities in your brain that might be causing your seizures, such as tumors, bleeding and cysts.

# Symptoms

The main symptom of epilepsy is a long-term risk of recurrent seizures. Seizures can affect people in different ways, depending on which part of the brain is involved and the person's age. Symptoms differ according to the type of seizure.

## Focal aware seizures (FAS)

Focal aware seizures, previously called partial seizures, are the most common type of seizure experienced by people with epilepsy. A FAS begins in one side of the brain and the person has no loss of awareness of their surroundings during it, even if the person is conscious and will usually know that something is happening and will remember the seizure afterwards.

### **Tonic-clonic seizure**

This type (also known as the grand mal seizure or convulsion), is the type of seizure that most people imagine when they think of seizures. As implied by the name, they combine the characteristics of tonic and clonic seizures. Tonic means stiffening, and clonic means rhythmical jerking. The seizure normally stops after a few minutes, but some last longer and if it lasts more than 5 minutes is a medical emergency. A person who's had a tonic-clonic seizure has often little or no memory of the experience.

### **Atonic seizure**

Atonic (meaning "without tone") seizures cause all your muscles to suddenly relax and become limp, so the person may fall to the ground and may injure the head or face. They tend to happen without warning and be very brief, so the person usually can get up again straight away.

### **Focal impaired awareness seizures (FIAS)**

Focal impaired awareness seizures (once called complex partial seizures) are the most common type of seizures in adults with epilepsy. It begins in one side of the brain and the person has a change in their level of awareness during some or all of it. The person's consciousness is affected and they may become confused.

### **Myoclonic seizure**

Myoclonic (meaning 'muscle jerk') seizures are brief, shock-like jerks of a muscle or a group of muscles, usually affecting the arms, legs, and upper body. Usually they don't last more than a second or two. They often happen soon after waking up. There can be just one, but sometimes many will occur in a short space of time and don't cause a loss of consciousness.

### **Absence seizure**

An absence seizure (which used to be called a "petit mal") causes a short period of blank stare, staring into space or loss of awareness. They mainly affect children but can happen at any age.

## Treatment

Treatment plans for epilepsy can help most people reduce the occurrence of seizures and are based on severity of symptoms, health, and how well the patient responds to therapy.

Some treatment options include:



### **Anti-epileptic drugs (AEDs)**

These medications can reduce or eliminate the number of seizures. It is estimated that 70% of people living with epilepsy could have their seizures fully controlled with timely and appropriate AED treatment. This would be achieved with early access to specialist assessment and comprehensive care, including appropriate counseling and partnership with the patient<sup>9</sup>.




### **Brain surgery**


If AEDs aren't controlling your seizures or if tests show that your seizures are caused by a problem in a small part of your brain, removing part of it may stop completely the seizures.

# Further information

## International League Against Epilepsy

 [www.ilae.org](http://www.ilae.org)

## Epilepsy Alliance Europe

 [www.epilepsyallianceeurope.org](http://www.epilepsyallianceeurope.org)

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