

## Epilepsy explained

To say a person has epilepsy simply means that a person has shown a tendency to have recurring seizures. Therefore, when a person has a single seizure this does not necessarily mean that they have epilepsy. It is estimated that approximately 50% of people who have one seizure go on to have more seizures. For people at risk of recurring seizures, 60-70% can expect seizure control with medication.

### What is epilepsy?

Epilepsy is a disorder of brain function that takes the form of recurring convulsive or non-convulsive seizures.

While it is estimated between 5% and 10% of the population will have a seizure at some time, we only talk about them as having epilepsy if the seizures are recurring and unprovoked. There are seizures that are not epileptic such as those that result from diabetes, kinked blood vessels and a range of other health conditions.



### Who gets epilepsy?

Epilepsy is a common condition in our community and can develop at any age, regardless of gender or ethnic group. Research suggests that 2-3% of the Australian population will develop epilepsy at some stage in their lives. Epilepsy was once considered a disorder of the young as it was believed that most people experienced their first seizure before the age of 20. However, the over 55 years age group is now being recognized as being the most vulnerable group. This rapidly growing demographic group is subject to the kinds of cerebrovascular, respiratory and cardiac events that can lead to epileptic seizures.

### What causes epilepsy?

There are many causes of epilepsy, which vary with the age at which seizures begin and the nature of the seizures. However 50% of cases, the cause is unknown.

We know that structural abnormalities in the developing brain, infections such as meningitis or encephalitis, or lack of oxygen to the brain during birth or after a stroke, can cause epilepsy. A brain injury, which results in scar tissue, predisposes individuals to developing epilepsy, although there can be a long period, often years, between the damage occurring and the seizures commencing. Why this occurs, we still do not know. Epilepsy can result from a tumour (an uncommon cause in children) and, in the over 65s from degenerative conditions such as Alzheimers disease.

Current research has identified that in many cases of epilepsy in very young children, genetics play an important role. But genetics can be a factor in developing epilepsy at any age. It appears that certain people are simply more prone to having seizures than others. This is, at times, described as having a 'low-seizure threshold'. A history of seizures in the family makes it more likely for them to develop epilepsy.

### What is a seizure?

Our every thought, feeling or action is controlled by brain cells that communicate with each other through regular electrical impulses. These impulses travel along the network of nerve cells, called neurons, in the brain and throughout the body via chemical messengers called neurotransmitters. A seizure occurs when the brains nerve cells misfire and generate sudden, uncontrolled burst of electrical activity in the brain. The orderly communication between nerve cells becomes scrambled and our thoughts, feelings or movements become momentarily confused or uncontrolled.

While seizures can be frightening, in most instances they stop without intervention. Once the seizure is over the person gradually regains control and re-orientes themselves to their surroundings, generally without any ill effects. The majority of people diagnosed with epilepsy will have their seizures controlled with medication.

### Types of seizures

Generally, seizures fall into two categories: partial or focal seizures and primary generalized seizures. The difference between these two types is in how they begin.

**Partial or focal seizures** start in one **part** of the brain [that is at a **focal** point in the brain] and affect that part of the body controlled by that part of the brain. This type of seizure can be related to, stroke or tumour head injury, stroke or tumour, but in most cases the cause is unknown.

**Primary generalized seizures** involve the whole brain and therefore involve the whole body. Hereditary factors are important in many of these seizures.

A brief description of the most common seizure types follows:

## **Focal or Partial Seizures**

### ***Simple partial seizure***

Simple partial seizures are localized seizures, affecting only one part of the brain. The symptoms the person experiences will depend on the function that part of the brain controls. The seizure may involve the involuntary movement or stiffening of a limb, feelings of *dejà vu*, an unpleasant smell or taste, or sensations in the stomach such as butterflies or nausea. The person remains alert throughout the seizure and can remember what happens. The seizure usually lasts less than two minutes. A simple partial seizure can progress to a complex partial seizure and/or a secondarily generalized seizure.

### ***Complex partial seizure***

This type of seizure usually starts in a small area of the temporal lobe or frontal lobe of the brain. The person's conscious state is altered rather than lost. The person may often appear confused and dazed and may do strange and repetitive actions like fiddling with their clothes, making chewing movements or uttering unusual sounds. These behaviours may also be described as trance-like or robot-like and are called automatisms. The seizure usually lasts for one to two minutes but the person may be confused and drowsy for some minutes to several hours afterwards and have no memory of the seizure or the events just before or after it. At times complex partial seizures can progress to secondarily generalized seizures. This type of seizure can be mistaken for drug /alcohol-affected behaviour or psychiatric disturbance.

## **Primary Generalized Seizures**

There are many types of generalized seizures, some convulsive, others non-convulsive.

### ***Absence seizure [previously called petit mal seizure]***

This is a brief, repetitive, non-convulsive event, usually occurring in the young, and involves the whole brain. With this type of seizure, the person's awareness and responsiveness are impaired. They simply stare, their eyes might roll back or their eyelids flutter, and in some cases there may be hand movements.

It can be difficult to tell the difference between absence seizures and daydreaming. However, absence seizures start suddenly, cannot be interrupted, last a few seconds, and then stop suddenly and the person goes on with what they were doing. Although these seizures usually last less than 10 seconds, they can occur many times daily, and thus be very disruptive to learning.

### ***Atonic seizure***

Atonic seizures are generalized seizures that affect muscle tone causing the person to collapse to the ground. The person usually remains conscious. Often called drop attacks or astatic seizures, these seizures can cause head or facial injury. Protective headwear is advisable to avoid constant injury. Recovery is generally quite quick. Seek medical attention if the person is injured.

### ***Myoclonic seizure***

Myoclonic seizures are brief, shock-like jerks of a muscle or a group of muscles, usually lasting no more than a second or two. There can be just one, but sometimes many will occur within a short time.

### ***Tonic seizure***

In tonic seizures the body's muscle tone is greatly increased and the body, arms, or legs make sudden stiffening movements. These seizures most often occur in clusters during sleep. Seizures can occur when the person is awake, and if the person is standing they will fall quite heavily, often injuring their head. Seizure duration is usually less than 20 seconds and consciousness is generally preserved. If appropriate it is advisable for the person to wear a protective helmet to avoid injury. Seek medical attention if the person is injured.

### ***Tonic-clonic seizure [sometimes called grand mal seizures]***

Tonic-clonic seizures generally last 1 to 3 minutes. Unless an individual epilepsy care plan states otherwise, follow these general guidelines. If the active movements of the seizure last more than 5 minutes it is advisable to call an ambulance. Seizures that last more than 30 minutes, or a series of seizures without a normal break in between, indicate a dangerous condition called convulsive status epilepticus and demands emergency treatment.

During a tonic-clonic seizure a person's body stiffens and they fall to the ground [the tonic phase]. Air being forced past the vocal cords causes a cry or groan. The tongue or cheek may be bitten, so bloody saliva may come from the mouth. Their limbs then begin to jerk in strong, symmetrical, rhythmic movements [the clonic phase]. The person may dribble from the mouth, go blue or red in the face, or lose control of their bladder and/or bowel. The seizure generally stops after a few minutes. As consciousness returns the person may be confused, drowsy, agitated or depressed. They may have a headache and want to sleep. This drowsiness can last for a number of hours. This seizure type is the one most people think of when they think of epilepsy.

Although this type of seizure can be frightening to watch, the seizure itself is unlikely to seriously harm the person having

the seizure. They may however vomit or bite their tongue and can sometimes injure themselves if they hit nearby objects as they fall or convulse.

## **Secondarily generalized seizures**

Secondarily generalized seizures are so called because they only become generalized (where the activity spreads to both sides of the brain) after the initial or primary event, a partial seizure, has begun. These occur when a burst of electrical activity in a focal area of the brain (the partial seizure) spreads throughout the brain. This event can be so brief that the person does not recall or recognize it. The generalized convulsive stage of these seizures usually lasts no more than a 1-3 minutes, similar to primary generalized seizures. Secondarily generalized seizures occur in more than 30% of people with partial seizures.

## **Seizure Triggers**

Some people, although not all, find that certain factors induce seizures. You may not become aware of your trigger factors unless you keep a seizure diary for a period of time. The following list of trigger factors is a guide but it is by no means an exhaustive list.

### **Alcohol**

Epilepsy shouldn't stop you from having the occasional beer or two or a glass of wine with dinner. Most people with epilepsy can drink a moderate amount of alcohol. Moderate drinking means having 2 standard drinks a day.

A standard drink is equal to:

- One small glass of wine (100ml)
- One middy of full strength beer (285ml)
- One nip of spirits (30ml)

Be aware of the quantity of alcohol you drink and don't let anyone persuade you to drink more. Alcohol and antiepileptic medications interact in specific ways. AEDs can make you more sensitive to the sedating effects of alcohol while alcohol reduces the effectiveness of AEDs making seizures more likely. Excessive drinking can result in poor seizure control due to late nights, missed meals, or forgotten doses, while 'hangover' seizures are likely to occur as the alcohol level in the blood falls.

Excessive drinking can result in:

- Poor seizure control due to late nights
- Missed meals
- Forgotten doses
- Hangover seizures as the alcohol level in the blood falls.

However some people find that even small amounts of alcohol can trigger seizures. Ask your doctor about the effects of drinking alcohol with the medication you have been prescribed.

### **Diet**

Coffee, tea and drinks with cola contain caffeine. In some people caffeine can trigger seizures while others are susceptible to having seizures if they miss meals and have a low blood sugar level. Regular meals and eating immediately after getting out of bed in the morning will protect you against large swings in blood sugar levels.

### **Infections and illness**

Children are particularly likely to have more seizures when they develop infections such as tonsillitis and earache. This is possibly due to high temperature and usually eases within a few days.

Allergies may provoke seizures in some people with epilepsy. Diarrhoea and vomiting can trigger seizures because they can prevent your body from absorbing your antiepileptic medication. Ask your doctor what you should do if this occurs.

### **Lack of sleep**

This is a common trigger factor. Everyone differs in the amount of sleep they need, however avoid wild fluctuations in the time you go to bed and make sure you get enough sleep to feel rested.

### **Menstruation**

Some women find that they have more seizures just before or during their menstrual period. This may be caused by a combination of factors such as increased fluid retention, alteration in hormonal levels and alteration in the blood levels of antiepileptic medications. A significant increase in seizure activity at this time is known as catamenial epilepsy. If you notice this happening, discuss it with your doctor. By altering your dose of antiepileptic medication or introducing another medication your doctor may be able to control or ease the problem.

## **Missed medication**

Some people are particularly sensitive to increased seizures when they miss a dose of their antiepileptic medication. The longer the break between doses, the lower your blood levels will go and the greater your chance of having a seizure. If you take your medication erratically or you suddenly stop taking all medication, you may trigger a severe and prolonged seizure or a cluster of seizures that will require hospitalisation.

## **Other drugs**

Withdrawal from sedative and hypnotic drugs including minor tranquillisers, sleeping pills and illegal drugs can be a problem, as can combining these drugs with antiepileptic medication. It is important to tell your doctor about all the medications you take. And this includes telling him or her about any over the counter herbal or vitamin supplements that you are taking or planning to take.

## **Other possible triggers**

There are other possible triggers with some unique to certain people. For example some unusual stimuli known to trigger seizures include the colour yellow, the smell of glue and sounds such as the telephone ringing or a siren.

## **Photosensitivity**

Photosensitive epilepsy is rare affecting only a small number of people with epilepsy. With photosensitive epilepsy seizures are triggered by sensory stimuli such as flickering sunlight, strobe lights and flickering television. Simple preventative measures can be taken to decrease seizures triggered this way such as wearing wrap-around sunglasses to reduce glare and covering one eye to reduce the effects of flickering or flashing light. Most computer monitors do not present a problem, however if you are sensitive to screen flicker, try using a non-interlaced monitor and take regular breaks.

## **Severe changes in temperature**

In some people seizures may be triggered when the weather becomes very warm or rooms are overheated.

## **Stress**

Stress is a normal part of life. In fact we need a certain amount to motivate ourselves and to stay healthy. Extreme stress, however, may lower your seizure threshold and trigger seizures. It is important to learn to recognise the signs and symptoms of harmful levels of stress and to employ strategies that you find helpful in reducing it. Relaxation techniques such as yoga, breathing exercises or aerobic exercise might be options worth trying.

## **How is epilepsy diagnosed?**

Epilepsy is not one condition. There are numerous epilepsy syndromes and each has its own symptoms, seizure types, causes, methods of diagnosis, outcomes and management. Accurate identification of the epilepsy syndrome will ensure the most appropriate treatment.

In diagnosing epilepsy, the presence of seizures is often the determining factor. An eyewitness report of the event and the person's own description of what happened prior to the event and how they felt afterwards can be your doctor's best diagnostic tools. All the tests the doctor might order are to gather specific data on the kind of seizures experienced and to confirm what is basically diagnosed through observation.

A neurological examination will be conducted that generally includes a test to measure the electrical activity of the brain [EEG]. This will help determine where in the brain the electrochemical activity that is generating the seizure activity is occurring. Specialized imaging tests such as computerized tomography [CT] scans and magnetic resonance imaging [MRI] scans may be required, along with blood tests. For some tests may require hospitalization while the seizures are observed and recordings taken during the event. This kind of testing is not always called for and nor is it always conclusive.

Diagnosing epilepsy in a child can be a harrowing experience. Many a parent has observed seizures at home that are not subsequently picked up in hospitals by the most sophisticated scanning. They are sometimes told to stop imagining that their child has epilepsy. This is a frustrating situation for a parent to be in and fortunately most doctors will now listen sympathetically to parents and treat them as a primary information source in helping to manage and correctly diagnose their children's health.

[Epilepsy Australia Affiliates](#) may make video cameras available. By videoing the event or behaviour when it occurs parents/carers can provide their doctor with recorded evidence to support their personal observations. This can sometimes be very helpful in obtaining an appropriate diagnosis.