

The brain is made up of millions of nerve cells called neurons. They generate electrical impulses and messages to produce thoughts, feelings and movement. A seizure occurs when the normal pattern of these impulses is disrupted, caused by the neurons rapidly firing all at once. This can cause changes in sensation, awareness and behaviour, or sometimes convulsions, muscle spasms or loss of consciousness, depending on where the seizure starts and spreads in the brain.

There are many different types of seizures. Having some basic knowledge about seizures can help to recognise and know what to do when a seizure occurs.

Most seizures fall into three groups, focal, generalised and unknown.

Focal onset seizures

Focal seizures are often very subtle or unusual, and may go unnoticed or be confused with other events. They occur in one small area of the brain and can sometimes spread to other regions. When they spread, they can evolve to become a bilateral convulsive seizure, most commonly a tonic clonic seizure. Around 60% of people with epilepsy have focal seizures and these seizures are sometimes very resistant to antiepileptic medications.

Focal seizures - retaining awareness

These seizures are often termed an 'aura' or warning and they can occur before a focal seizure with altered awareness (formerly complex partial seizure); or a tonic clonic seizure; or occur on their own. There is no loss of awareness or consciousness and they usually last less than a minute and can include symptoms such as:

- Sensory - numbness, tingling or burning sensation in a region of the body
- Motor - jerking of a limb, twitching of the face
- Autonomic - blushing, pallor, racing heart-rate, nausea
- Psychic - déjà vu, hallucinations (visual, sound, taste or smell), anxiety or panic

Focal seizures - altered awareness

These seizures were previously termed complex partial seizures. They can vary greatly, depending on where they start and spread within the brain. Many of this type of seizure begin with a vacant stare, loss of expression or a vague, confused appearance. Awareness is altered, and the person may or may not respond. If they do respond, it is usually inappropriate. Sometimes people have unusual and repetitive behaviours. Common behaviours include chewing, fidgeting, walking around or mumbling. Focal seizures can last from 30 seconds to three minutes. After the seizure, the person is often confused for a short period and may not remember anything about the seizure.

Focal seizures of both types can spread to become a bilateral tonic clonic seizure.

Generalised onset seizures

There are many kinds of generalised seizures. These occur when the seizure activity involves both hemispheres of the brain simultaneously. As a result, consciousness is impaired at the beginning of the seizure in many of these seizure types.

Generalised tonic clonic seizures

These are the most recognised seizures. They begin with a sudden loss of consciousness and often the person will cry out. If standing, the person will fall, their body stiffens (tonic) followed by jerking of the muscles (clonic). Breathing is shallow or temporarily suspended causing the lips and complexion to look grey/ bluish. There is usually excess saliva in the person's mouth, sometimes also blood if they have bitten their tongue. There may be loss of bladder control. The seizure usually lasts approximately two minutes or less and is often followed by a period of confusion, agitation and sleep. Headaches and soreness are also common afterwards.

Absence seizures

These seizures usually start in childhood (but can occur in adults), and are sometimes mistaken for daydreaming and inattentiveness. There is often a family history. They start suddenly and are characterised by staring, loss of expression, unresponsiveness and, stopping any activity they are doing. Sometimes eye blinking or upward eye movements are seen. They can last from 2 to 10 seconds and end abruptly. The person usually recovers immediately and resumes their previous activity, with no memory of the seizure. People with absence seizures usually have normal intelligence, but because the seizures occur many times a day, they can create gaps and disrupt learning if not managed. Children often outgrow this seizure type by puberty.

Other types of absence seizures include atypical absences seizures (absence seizures usually longer than 10 seconds with partial responsiveness), as well as those with special features, myoclonic absences (rhythmic myoclonic jerks of shoulders, arms and legs mouth with absences lasting 8-60 seconds) and eyelid myoclonia (1-2 second absence with upward simultaneous eyelid and eyeball jerks)

Myoclonic seizures

These seizures are very brief but intense muscle jerks usually involving the upper body. Many people mistake them for clumsiness as they often occur after awakening resulting in dropping or spilling things. Although consciousness is not impaired, the person may feel confused or drowsy if several seizures occur over a short period. They can sometimes lead to a tonic clonic seizure.

This group also includes the rarer myoclonic atonic seizures (the loss of muscle tone is preceded by a myoclonic jerk) and the myoclonic tonic seizures (an increase in muscle tone is associated with the seizure).

Tonic seizures

These cause a sudden, brief stiffening of the muscles of the whole body, causing the person to become rigid and fall rapidly if they are standing. Recovery is swift, but injuries can be sustained. Tonic seizures can also occur in sleep.

Atonic seizures

Atonic seizures are sudden, brief loss of muscle tone of the body. The person will become limp and collapse, usually head first, so facial and head injuries are common. There is no noticeable loss of consciousness and recovery is swift unless the person is injured.

Unknown Onset

This is a grouping of seizures that cannot be diagnosed as either a focal or generalised seizure and are thus grouped as unknown. Unknown onset seizures are not truly separate types of seizures, but rather placeholders for seizure types for which the onset is unknown. Sometimes this classification is provisional and as more information becomes available over time or through further testing, the type of seizure may be changed to a generalised or focal onset seizure.

This classification of seizures is when a seizure is unable to be classified due to either:

- inadequate information or
- an unusual nature of the seizure, or
- the inability to classify the seizure as either focal or generalised onset.

Seizures of unknown onset may have features may still be classified as:

- Motor onset
- Non-motor onset or
- Unclassified

Important points to remember about seizures:

- Most seizures last less than two minutes, although there may be a period of confusion afterwards.
- Sometimes confusion after a seizure can be prolonged, lasting up to several hours.
- Exhaustion often follows a seizure, especially a tonic clonic seizure, and rest or sleep is needed.
- Seizures cannot be stopped or slowed by restraint. The brain almost always stops the seizures naturally.
- It is physically impossible to swallow the tongue so there is no need to insert anything into a person's mouth. Doing this is dangerous and fingers may be bitten or teeth broken.
- In emergencies, medications can be used to stop prolonged seizures.
- After seizures, most people remember little, if anything about what has happened.