

Epilepsy - A General Introduction

About 1 in 30 people in the UK develops epilepsy at some stage in their life. It most commonly starts in childhood and in people over 60. However, epilepsy can begin at any age. In general, seizures are well controlled by treatment in about 4 in 5 cases.

There are different types of epilepsy. Other leaflets in this series include: 'Epilepsy - Partial Seizures', 'Epilepsy - Childhood Absence Seizures', 'Epilepsy - Could It Be?', 'Epilepsy - Living With Epilepsy', 'Epilepsy - Treatments', 'Epilepsy - Tonic-clonic Seizures', 'Epilepsy - Dealing With a Seizure', 'Epilepsy - Contraception / Pregnancy Issues', 'Epilepsy and Sudden Unexpected Death'.

What is a seizure?

A seizure is a short episode of symptoms caused by a burst of abnormal electrical activity in the brain. Typically, a seizure lasts from a few seconds to a few minutes. (Older words for seizures include convulsions and fits.)

The brain contains millions of nerve cells (neurones). Normally, the nerve cells are constantly sending tiny electrical messages down nerves to all parts of the body. Different parts of the brain control different parts and functions of the body. Therefore, the symptoms that occur during a seizure depend on where the abnormal burst of electrical activity occurs. Symptoms that may occur during a seizure can affect your muscles, sensations, behaviour, emotions, consciousness, or a combination of these. The different types of seizures are discussed below.

What is epilepsy?

If you have epilepsy, it means that you have had repeated seizures. If you have a single seizure, it does not necessarily mean that you have epilepsy. About 1 in 20 people has a seizure at some time in their life. It may be the only one that occurs. The definition of epilepsy is 'more than one seizure'. The frequency of seizures in people with epilepsy varies. In some cases there may be years between seizures. At the other extreme, in some cases the seizures occur every day. For others, the frequency of seizures is somewhere in between these extremes.

Epilepsy can affect anyone at any age. Around 456,000 people in the UK have epilepsy.

Epileptic seizures arise from within the brain. A seizure can also be caused by external factors which may affect the brain. For example, a high fever may cause a 'febrile convulsion'. Other causes of seizures include: lack of oxygen, a low blood sugar level, certain drugs, poisons, and a lot of alcohol. Seizures caused by these external factors are not classed as epilepsy.

Different types of epilepsy and seizures

Seizures are divided into two main types - generalised and partial. (There are also other uncommon types of seizure.) If you have epilepsy you usually have recurrences of the same type of seizure. However, some people have different types of seizure at different times.

Generalised seizures

These occur if the abnormal electrical activity affects all or most of the brain. The symptoms tend to be 'general' and involve much of your body. There are various types.

- **A tonic-clonic seizure** is the most common type of generalised seizure. With this type of seizure your whole body stiffens, you lose consciousness, and then your body shakes (convulses) due to uncontrollable muscle contractions.
- **Absence seizure** is another type of generalised seizure. With this type of seizure you have a brief loss of consciousness or awareness. There is no convulsion, you do not fall over, and it usually lasts only seconds. Absence seizures mainly occur in children.
- **A myoclonic seizure** is caused by a sudden contraction of the muscles, which causes a jerk. These can affect the whole body but often occur in just one or both arms.
- **A tonic seizure** causes a brief loss of consciousness, and you may become stiff and fall to the ground.
- **An atonic seizure** causes you to become limp and to collapse, often with only a brief loss of consciousness.

Partial seizures

In these types of seizures the burst of electrical activity starts in, and stays in, one part of the brain. Therefore, you tend to have localised or 'focal' symptoms. Different parts of the brain control different functions and so symptoms depend on which part of the brain is affected:

- **Simple partial seizures** are one type. You may have muscular jerks or strange sensations in one arm or leg. You may develop an odd taste, or pins and needles in one part of your body. You do not lose consciousness or awareness.
- **Complex partial seizures** are another type. These commonly arise from a temporal lobe (a part of the brain) but may start in any part of the brain. Therefore, this type is sometimes called 'temporal lobe epilepsy'. Depending on the part of the brain affected, you may behave strangely for a few seconds or minutes. For example, you may fiddle with an object, or mumble, or wander aimlessly. In addition, you may have odd emotions, fears, feelings, visions, or sensations. These differ from simple partial seizures in that your consciousness is affected. You may not remember having a seizure.

Sometimes a partial seizure develops into a generalised seizure. This is called a secondary generalised seizure.

What causes epilepsy?

Unknown cause ('idiopathic epilepsy')

In many cases, no cause for the seizures can be found. The abnormal bursts of electrical activity in the brain occur 'out of the blue'. It is unclear why they start, or continue to occur. Genetic (hereditary) factors may play a part in some cases. People with idiopathic epilepsy usually have no other neurological (brain) condition. Medication to control seizures usually works very well.

Symptomatic epilepsy

In some cases, an underlying brain condition or brain damage causes epilepsy. Some conditions are present at birth. Some conditions develop later in life. There are many such conditions. For example: a patch of scar tissue in a part of the brain, a head injury, stroke, cerebral palsy, some genetic syndromes, growths or tumours of the brain, and previous infections of the brain such as meningitis, encephalitis. The condition may 'irritate' the surrounding brain cells and trigger seizures.

Some underlying conditions may cause no other problems apart from seizures. In other cases, the underlying condition may cause other problems or disabilities in addition to the seizures.

These days, with more advanced scans and tests, a cause can be found for some cases previously thought to be idiopathic (unknown cause). For example, a small piece of scar tissue in the brain, or a small anomaly of some blood vessels inside the brain. These may now be found by modern brain scanning equipment which is more sophisticated than in the past.

What triggers a seizure?

There is often no apparent reason why a seizure occurs at one time and not at another. However, some people with epilepsy find that certain 'triggers' make a seizure more likely. These are not the *cause* of epilepsy, but may trigger a seizure on some occasions.

Possible triggers may include:

- Stress or anxiety.
- Some medicines such as antidepressants, antipsychotic medication (these lower the seizure threshold in the brain).
- Lack of sleep, or tiredness.
- Irregular meals (or skipping meals) which may cause a low blood sugar level.
- Heavy alcohol intake or using street drugs.
- Flickering lights such as from strobe lighting or video games.
- Menstruation (periods).
- Illnesses which cause fever such as 'flu or other infections.

How is epilepsy diagnosed?

You should see a doctor if you have had a 'possible seizure' or similar event. Sometimes it is difficult for a doctor to confirm that you have had a seizure. The most important part of confirming the diagnosis is the description of what happened. Other conditions can look like seizures. For example, faints, panic attacks, collapses due to heart problems, breath-holding attacks in children.

Therefore, it is important that a doctor should have a clear description of what happened during the 'event'. It may be that a person who witnessed your seizure may be able to give a more accurate description of what happened during your seizure.

There is no one test to confirm a diagnosis of epilepsy. However, tests such as brain scans, EEG and blood tests may help to make a diagnosis.

- **A brain scan** (usually an MRI or CT scan) shows the structure of different parts of the brain. This may be performed in some people.
- **ElectroEncephaloGram (EEG)**. This test records the electrical activity of the brain. Special stickers are placed on various parts of the scalp. They are connected to the EEG machine. This amplifies the tiny electrical messages given off by the brain and records their pattern on paper or computer. The test is painless. Some types of seizure produce typical EEG patterns. However, a normal recording does not rule out epilepsy, and not all EEG abnormalities are related to epilepsy.
- **Blood tests** and other tests may be advised to check on your general well being. They may also look for other possible causes of the 'event'.

Although helpful, tests are not foolproof. It is possible to have epilepsy with normal test results. Also, if an abnormality is found on a brain scan, it does not prove that it causes seizures.

However, tests may help to decide if the 'event' was a seizure, or caused by something else. It is unusual for a diagnosis of epilepsy to be made after one seizure, as the definition of epilepsy is 'recurrent seizures'. For this reason a doctor may suggest to 'wait and see' if it happens again before making a firm diagnosis of epilepsy.

What are the treatments for epilepsy?

Medication

Epilepsy cannot be 'cured' with medication. However, with the right type and strength of medication, the majority of people with epilepsy do not have seizures. The medicines work by stabilising the electrical activity of the brain. You need to take medication every day to prevent seizures. Deciding on which medicine to prescribe depends on such things as: your type of epilepsy, your age, other medicines that you may take for other conditions, possible side-effects, whether you are pregnant or if planning a pregnancy.

One medicine can prevent seizures in most cases. A low dose is usually started at first. The dose may be increased if this fails to prevent seizures. In some cases two medicines are needed to prevent seizures.

The decision *when* to start medication may be difficult. A first seizure may not mean that you have epilepsy, as a second seizure may never happen, or may occur years later. The decision to start medication should be made by weighing up all the pros and cons of starting, or not starting, the medicine. It is unusual to start treatment after a first seizure. A common option is to 'wait and see' after a first seizure. If you have a second seizure within a few months, more are likely.

Medication is commonly started after a second seizure that occurs within 12 months of the first. However, there are no definite rules and the decision to start medication should be made after a full discussion with your doctor.

The type of treatment you will be given often depends on the type of seizures you have and also if you are taking any other medication.

Some points about medication for epilepsy include the following:

- Ask your doctor how long treatment is likely to be advised. This will vary from case to case. If you have not had seizures for several years, you may wish to try stopping medication. However, this depends on your particular type of epilepsy, as some types will need medication for life. Your life circumstances may influence the decision about stopping medication. For example, if you have recently regained your driving licence, the risk of losing it again for a year if a seizure occurs may affect your decision. However, if you are a teenager who has been free of seizures for some years, you may be happy to take the risk.
- Although the list of *possible* side-effects for each medicine seems long, in practice, most people have few or no side-effects, or just minor ones. Ask your doctor which side-effects are important to look out for. If you develop a troublesome side-effect it may be dose-related, or may diminish in time. Alternatively, a switch to another medicine may be advised.
- Medicines which are used for other conditions may interfere with medication for epilepsy. If you are prescribed *or buy* another medicine, remind your doctor or pharmacist that you take medication for epilepsy. Even things like indigestion medicines may interact with your epilepsy medication, which may increase your chance of having a seizure.
- Some medicines for epilepsy interfere with *the contraceptive pill*. A higher dose pill or an alternative method of contraception may be needed.
- Tell your doctor if you intend to become pregnant. Pre-conception counselling is important for women with epilepsy.
- If you have epilepsy and take medication, you are exempt from prescription charges for all your prescriptions. You need an exemption certificate. You can get this from your pharmacist.

Other treatments for epilepsy

- **Surgery** to remove a small part of the brain which is the underlying cause of the epilepsy. This is only a suitable option if your seizures start in one small area of your brain (this means it is only possible for a minority of people with epilepsy). It may be considered when medication fails to prevent seizures. However, there are risks from operations. Only a small number of people with epilepsy are suitable for surgery and, even for those who are, there are no guarantees of success. Surgical techniques continue to improve and surgery may become an option for more and more people in the future.
- **Vagal nerve stimulation** is a treatment for epilepsy, where a small generator is implanted under the skin below the left collar bone. The vagus nerve is stimulated to reduce the frequency and intensity of seizures. This can be suitable for some people with seizures that are difficult to control with medication.
- **The ketogenic diet** is a diet very high in fat, low in protein and almost carbohydrate-free which can be effective in the treatment of difficult-to-control seizures in children.
- **Complementary therapies** such as aromatherapy may help with relaxation and relieve stress, but have no proven effect on preventing seizures.

What is the outlook (prognosis) for people with epilepsy?

The success in preventing seizures by medication varies depending on your type of epilepsy. For example, if no underlying cause can be found for your seizures (idiopathic epilepsy), you have a very good chance that medication can fully control your seizures. Seizures caused by *some* underlying brain problems may be more difficult to control.

The overall outlook is better than many people realise. The following figures are based on studies of people with epilepsy, which looked back over a five-year period. These figures are based on grouping people with all types of epilepsy together, which gives an overall picture:

- About 5 in 10 people with epilepsy will have no seizures at all over a five-year period. Many of these people will be taking medication to stop seizures. Some will have stopped treatment having had two or more years without a seizure whilst taking medication.
- About 3 in 10 people with epilepsy will have some seizures in this five-year period, but far fewer than if they had not taken medication.
- So, in total, with medication, about 8 in 10 people with epilepsy are 'well controlled' with either no, or few, seizures.
- The remaining 2 in 10 people experience seizures, despite medication.
- A very small number of people with epilepsy have sudden unexplained death. The exact cause of this is unknown, but may be related to a change in the breathing pattern or to abnormal heart rhythms during a seizure. However, this is rare and the vast majority of people with epilepsy fully recover following each seizure.

A trial without medication may be an option if you have not had any seizures over 2-3 years. If a decision to stop treatment is made, a gradual reduction of the dose of medication is usually advised over several months. You should never stop taking medication without discussing it with a doctor.

The above section on outlook (prognosis) relates just to seizures. Some underlying brain conditions which cause seizures may cause additional problems.

Most people with epilepsy live full and active lives, but may have to accept some changes to their lifestyle. For example, you must not drive for a period laid down by law. Below are further sources of information, help and support on all aspects of epilepsy:

Further help and information

Epilepsy Action

New Anstey House, Gateway Drive, Leeds, LS19 7XY
Helpline: 0808 800 5050 Web: www.epilepsy.org.uk

National Society For Epilepsy

Chesham Lane, Chalfont St Peter, Gerrards Cross, Bucks, SL9 0RJ
Helpline: 01494 601 400 Web: www.epilepsynse.org.uk

Epilepsy Scotland

48 Govan Road, Glasgow, Scotland, G51 1JL
Helpline: 0808 800 2200 Web: www.epilepsyscotland.org.uk

Epilepsy Wales

PO Box 4168, Cardiff, CF14 0WZ
Helpline: 08457 413 774 Web: www.epilepsy-wales.co.uk

References

- [Epilepsy](#), Clinical Knowledge Summaries (June 2009)
- [The diagnosis and management of the epilepsies in adults and children in primary and secondary care](#), NICE Clinical Guideline (October 2004)
- [Vining EP](#); Tonic and atonic seizures: medical therapy and ketogenic diet. *Epilepsia*. 2009 Sep;50 Suppl 8:21-4. [abstract]
- [Lulic D, Ahmadian A, Baaj AA, et al](#); Vagus nerve stimulation. *Neurosurg Focus*. 2009 Sep;27(3):E5. [abstract]

Comprehensive patient resources are available at www.patient.co.uk

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