



Epilepsy and inheritance

If you are concerned about your children inheriting epilepsy from you or a member of your family, you are not alone. Many people wonder whether epilepsy can be an inherited condition. The answer is not straightforward because there are many different types and causes of epilepsy. This factsheet is a summary of the research available at present.

Some people have epilepsy as a result of damage to the brain through, for example, injury, infection (such as meningitis), a difficult birth or stroke. This is known as symptomatic epilepsy. For around six in ten people however, there is no known cause (idiopathic epilepsy) or no identifiable cause (cryptogenic epilepsy).

Everyone has a seizure threshold: people with a high seizure threshold are more resistant to having seizures than people with a low seizure threshold. When a cause cannot be found for a person's epilepsy, they may have been born with a low seizure threshold, which means that they are more likely to have seizures than people in general.

There are three different ways in which epilepsy can be inherited.

1. A low epileptic seizure threshold may be inherited.
2. Epilepsy can be one of the symptoms of inherited medical conditions, for example tuberous sclerosis.
3. There are certain types of epilepsy where a family history has been identified. These include:

- Benign Rolandic epilepsy
- Juvenile myoclonic epilepsy
- Temporal lobe epilepsy

More information about these types of epilepsy is available from Epilepsy Action.

As the subject of epilepsy and inheritance is so complex, you may wish to discuss any concerns you have with your doctor. If the doctor feels it is appropriate, they may arrange referral to a genetic counsellor.

Genetic counsellors are highly trained specialists who can identify recognised genetic conditions. For epilepsy, genetic counsellors will need to consider information about which people in the family have had epilepsy, the seizure type, age of onset (when the epilepsy started), EEG results, and any other medical conditions they may have. Genetic counsellors will discuss their findings with the person or family, explain risks and options and offer guidance and support.

Here are some examples of questions you may have about epilepsy and inheritance:

What is the chance that my children will have seizures?

For each type of seizure (including unprovoked seizures and febrile convulsions), the risk is substantially higher if the mother has epilepsy than if the father does. Risk is either the same or slightly higher in children

of fathers with epilepsy than in the general population.

Why is the risk higher in children of mothers with epilepsy?

The answer to this question is unknown. The higher seizure risk in children of mothers with epilepsy does not appear to be caused by the use of anti-epileptic drugs during pregnancy, seizures occurring during pregnancy, or other complications during pregnancy.

Does the risk of children developing epilepsy depend on the type of epilepsy the parent has?

Certain types of epilepsy do appear to have different risks for children developing seizures. The risk for unprovoked seizures is higher in children of parents who developed epilepsy before 20 years of age (nine per cent), than in children whose parents developed the condition after the age of 20 (three per cent). Risk is also higher in children of parents with a history of absence seizures (nine per cent) than in children of those with other generalised (three per cent), or partial (five per cent) seizures.

Despite the slightly increased risk for seizures in children of parents with epilepsy, you may be reassured to find that the probability that your child won't have seizures is much higher than the probability that your child will have seizures. Even for parents in the highest risk categories (for example, women with epilepsy, people with absence seizures, or people who developed epilepsy at an early age), the probability that

your child will not develop epilepsy is greater than 90 per cent.

For more information about epilepsy and inheritance, please contact Epilepsy Action. As research is continually being carried out in this area, we may have more specific information about particular types of epilepsy.

Further reading

Much of this factsheet is based on information from these books:

Epilepsy A Comprehensive Textbook, Volume One, pp.181-182, editors Jerome Engel, Jr and Timothy A Pedley, published by Lippincot-Raven, 1998.

Genetics of Focal Epilepsies, Berkovic et al, published by John Libbey and Company Ltd, 1999.

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June 2007

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