Inheritance

Why are some families more likely to have epilepsy than others?

Some types of epilepsy and seizures run in families. These include childhood absence epilepsy (CAE), juvenile myoclonic epilepsy (JME), photosensitive seizures, generalised epilepsy with febrile seizures plus (GEFS+) and focal seizures. However, it’s more common for families to have different types of epilepsy in them. So if your child does develop epilepsy, it may well be a different type to other family members.

A small number of children are born with specific changes in specific genes that cause them to develop epilepsy. Although genes are inherited from both parents, these parents don’t themselves have epilepsy. The gene changes are very specific and only affect that child.

Seizure types

CAE, JME and GEFS+ are all epilepsies that affect people within a certain age range. All the seizures in these types of epilepsy are generalised ones. Some people who have temporal lobe epilepsy inherit this from their parents. Focal (partial) seizures are usual in temporal lobe epilepsy. It is thought that generalised seizure are more likely to be inherited than focal seizures. But recent research suggests that more focal seizures than previously thought can be inherited.

More information about different types of seizures is available from Epilepsy Action.

We all have something called a seizure threshold in our brain. A low seizure threshold seems to run in some families. People with a low seizure threshold are more likely to have seizures than people with a high seizure threshold. You might inherit a low seizure threshold.

Two to 3 in every 100 people with epilepsy have another medical condition that also causes epilepsy. The risk varies depending on what the other medical condition is. Tuberous sclerosis is a rare condition that is inherited. It causes non-cancerous tumours to develop in different parts of the body, including the brain. And it can cause other health conditions.

---

2 Thomas, RH Personal communication 14 May 2015.
including epilepsy, learning disabilities and autism. Eight or 9 in every 10 children born to a parent with tuberous sclerosis will develop epilepsy.  

More information about tuberous sclerosis is available from the Tuberous Sclerosis Association  

Tel: 01332 290 734  
Website: tuberous-sclerosis.org  

What is the risk of my child inheriting epilepsy?

Each type of epilepsy has a different level of risk for being inherited. If your epilepsy isn’t part of another medical condition, your child’s risk of inheriting it is thought to be less than 15 in every 100. It also depends on how many other family members have epilepsy, the type of epilepsy they have, and the age it started.

Here is some information about the risks of a child developing epilepsy, when other family members have epilepsy.

<table>
<thead>
<tr>
<th>Person in the family with epilepsy</th>
<th>Mother</th>
<th>Father</th>
<th>Mother and father</th>
<th>Other family members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of child developing epilepsy compared to children without a family history</td>
<td>Higher$^{10}$</td>
<td>Slightly higher$^{11}$</td>
<td>Higher than if just the mother has epilepsy. But even then it is more likely the child will not develop epilepsy.$^{12}$</td>
<td>The more people with epilepsy there are in a family the higher is the risk that the child will inherit epilepsy.$^{13}$</td>
</tr>
</tbody>
</table>

---

Accessed 18 April 2012  
$^{12}$ [https://www.google.co.uk/search?sourceid=navclient&hl=en-GB&q=20%25+risk+of+epilepsy#hl=en-GB&q=20%25+risk+if+parents+have+epilepsy](https://www.google.co.uk/search?sourceid=navclient&hl=en-GB&q=20%25+risk+of+epilepsy)  
**Age at which parent developed epilepsy**

<table>
<thead>
<tr>
<th>Age at which parent developed epilepsy</th>
<th>Under 20</th>
<th>20 - 35</th>
<th>Over 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of child developing epilepsy compared to children without a family history</td>
<td>Higher(^{14})</td>
<td>Slightly higher(^{15})</td>
<td>The same(^{16})</td>
</tr>
</tbody>
</table>

**To sum up**

Research into epilepsy and inheritance is being carried out all the time. So, in time, we might find out more about how epilepsy is inherited. Here is what we understand so far:

- The risk that a child will inherit epilepsy depends on the type of epilepsy that is in the family, which family members have epilepsy, and how old they were when they developed it
- Some types of epilepsy have a higher risk of being inherited than other types
- Some people don’t inherit epilepsy itself, but they inherit a low seizure threshold
- Some children are born with changes to specific genes that cause them to develop epilepsy
- Other than children with tuberous sclerosis, fewer than 15 in every 100 children born to parents with epilepsy will inherit epilepsy

**About this information**

This information is written by Epilepsy Action’s advice and information team, with guidance and input from people living with epilepsy and medical experts. If you would like to know where our information is from, or there is anything you would like to say about the information, please contact us at epilepsy.org.uk/feedback

Epilepsy Action makes every effort to ensure the accuracy of information but cannot be held liable for any actions taken based on this information.

**Our thanks**

Epilepsy Action would like to thank Dr Rhys Thomas, Clinical Lecturer in Neurology at Morriston Hospital, Swansea for his contribution to this information. He has declared no conflict of interest.

**Date:** August 2015  
**Due for review:** August 2018  
**Code:** F019.03

Your support
We hope you have found this information helpful. As a charity, we rely on donations to provide our advice and information. If you would like to make a donation, here are some ways you can do this.

- Visit [www.epilepsy.org.uk/donate](http://www.epilepsy.org.uk/donate)
- Text ACT NOW to 70700 (This will cost you £5 plus your usual cost of sending a text. Epilepsy Action will receive £5.)
- Send a cheque payable to Epilepsy Action to the address below.

Did you know you can also become a member of Epilepsy Action from as little as £1 a month? To find out more, visit epilepsy.org.uk/join or call 0113 210 8800.

Epilepsy Action Helpline
Freephone 0808 800 5050, text 0753 741 0044, email helpline@epilepsy.org.uk, tweet @epilepsyadvice

Contact details
Epilepsy Action, Gate Way Drive, Yeadon, Leeds LS19 7XY, UK, +44 (0)113 210 8800. A registered charity (No. 234343) and company limited by guarantee (No. 797997) in England. © Copyright Epilepsy Action