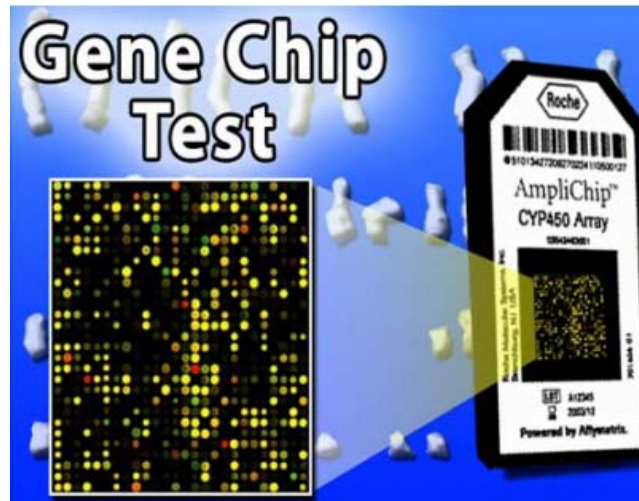


Epilepsy can be caused by genetic factors or acquired, although in most cases it arises in part from both. In this video, we will look at the genetic causes of epilepsy.



First, some basics. What is a gene? Our genes are the instruction set for building the human body. Genes reside on chromosomes. Every person has 46 chromosomes, carrying a total of about 30,000 genes. We get half our chromosomes from our mother and half from our father. While genes determine the structure of our body, they also control the excitability of our brain cells. Defective genes can make hyperexcitable brain cells, which are prone to seizures.

In recent years, several epilepsy conditions have been linked to mutations in genes, but the matter is complicated by the fact that different genes may be involved in different circumstances. In general, the most common epilepsy conditions, including partial seizures, seem to be more acquired than genetic. But even partial epilepsy has a genetic component. For example, if two people suffer a similar blow to the head, only one may develop epilepsy. This is because some people have genetically determined risk factors for developing seizures after head trauma.



Recently, doctors have discovered a technique called the gene chip, which can quickly screen thousands of genes in an individual. Each bright spot in the chip represents a strong presence of a particular gene in the person being tested. But how can knowledge of genes help us become more aware of epilepsy and better able to treat it? For example, genetic testing can help us to diagnose certain epilepsy conditions. Gene testing will soon be able to identify predispositions to epilepsy, allowing doctors to help a patient get treatment and to assist with family counseling. One day, doctors may simply be able to swap a patient's cheek, test his or her genes, and predict response to various epilepsy medicines, eliminating much of the trial and error in medication choice that goes on today. Eventually, we may even be able to repair or replace defective genes that predispose a person to epilepsy, a process called gene therapy.

The general population has about a 1% risk of developing epilepsy. Meanwhile, children of mothers with epilepsy have a 3 to 9% risk, while children of fathers have a 1.5 to 3% risk. Still, the actual risk is upon the specific type of epilepsy. For example, partial seizures are less likely to run in families than are generalized seizures. In any event, with the usual forms of epilepsy, even if a parent does have the condition, there is more than a 90% chance that their child will not.

Clearly, genes determine a great deal of who we are, including our risk for epilepsy. But what happens to us in life and what we do is still the larger part of the risk for epilepsy. Talk to your medical team and genetic counselors for more information about genetic predisposition to epilepsy.