

# Cousin marriage and genetic disorders



## Why is genetics important for me and my family?

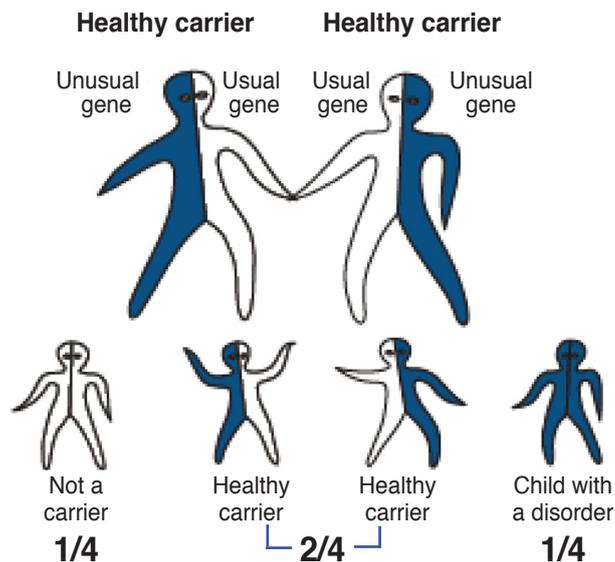
Have you ever wondered why members of the same family look similar? This is because blood relatives share a large number of their genes. Genes are tiny parts of every cell in the body. They control how the body works and grows. For example, your genes control your eye colour, the size of your feet and hands and much more.

We inherit many things from our parents. In the same way, we can inherit some disorders and disabilities from our parents through **unusual genes**. These are called **genetic (inherited) disorders**. Genetic disorders can cause children to die or have life-long disability. There are thousands of different genetic disorders, including cystic fibrosis, Tay-Sachs disease, sickle cell disorder and thalassaemia.

Families from **all** communities can be affected by genetic disorders. Some – known as “recessive” disorders - are more common in communities where couples are blood relatives, for example, cousins. Most children born to cousin couples are healthy, but a recessive disorder can occur when there is an unusual gene in the family and the couple **both** happen to have the **same** unusual gene. This can **only** happen when **both** parents have the same gene for a disorder.

## How do children inherit recessive disorders?

Everyone has two genes for every inherited feature in the body. One gene is inherited from the mother and the other from the father. The diagram shows a healthy couple who each carry one unusual gene for the **same** recessive disorder. They do not have the disorder themselves because their other gene works normally. They are called “healthy carriers”.



In every pregnancy, the child inherits one gene from each parent. There are three possibilities in **every** pregnancy:

1. If the child inherits a usual gene for the disorder from both parents **the child would not have, or carry the disorder**. There is a one in four chance of this happening.
2. If the child inherits a usual gene from one parent and an unusual gene from the other parent, **the child would, like its parents, be a healthy carrier of the disorder** and could pass the gene onto the next generation. There is a two in four chance of this happening.
3. If the child inherits an unusual gene from both parents then **the child would have the disorder**. There is a one in four chance of this happening.
  - The chance of having a child with a disorder is the same each time the couple has a baby.
  - Their next child could have the disorder, be a healthy carrier (like its parents) or be completely free of the disorder.
  - The chances are the same every time the mother becomes pregnant.

Useful websites for more information

[www.nhs.uk/conditions/genetics](http://www.nhs.uk/conditions/genetics), [www.geneticalliance.org.uk](http://www.geneticalliance.org.uk)

Please share this information with family and friends who may find it useful

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Leaflet adapted by the Every Baby Matters Recommendation 7 steering group in consultation with Genetics Communication

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## Common questions:

### **Are recessive disorders the only cause of disabilities in children?**

No. There are many causes of disabilities and different ways in which genetic disorders are inherited. There are thousands of different genetic disorders. Recessive disorders are only one type of genetic disorder. Cousin marriage only has a strong link with recessive disorders.

### **What is the link between cousin marriage and genetic disorders?**

Because genes get passed on in families, if a couple are blood relatives and there is a gene for a recessive disorder in their family, they have a greater chance of both carrying the gene for that disorder, than if they were not related by blood. This explains why there are more carrier couples and therefore more children born with recessive disorders in communities that have cousin marriage, or other close blood relative marriage.

### **I hear a lot about cousin marriage and disability being linked to the Pakistani origin community. Is this relevant to other communities as well?**

Recessive disorders are found in **every community** around the world and one fifth of the world's population live in communities that have marriage between cousins and other close blood relatives. All these communities have higher numbers of carrier couples and therefore greater numbers of children with recessive disorders.

In the UK, communities that have cousin marriage include those of Pakistani, Bangladeshi, and Middle Eastern origin, some communities of Indian origin, Irish travellers and some refugee groups; and to a much lesser extent the White majority community as well. Of these communities, the Pakistani origin community has the greatest number of cousin couples.

Bradford has a large Pakistani origin population. So, there are more cousin couples and therefore more children with recessive disorders in Bradford than most other UK cities.

### **I know people who are married to their cousin and have healthy kids. How can it be true that marrying a cousin results in disabled children?**

The parents being cousins is not the reason that their child is born with a disability; most babies born to cousin couples are healthy. Whether or not a couple are related by blood, there is only a risk of having a child with a recessive disorder when both parents carry the gene for the same disorder. For such a couple there is a one in four chance in every pregnancy that their child may inherit the disorder. This happens because the child inherits the unusual gene from both the father and the mother (see diagram).

When a cousin couple has a healthy child, this may be because the parents are not a carrier couple or if they are, then the child did not inherit the unusual gene from both parents. Being cousins just increases the chance that both parents would inherit the gene for the disorder in the family and be a carrier couple.

### **I am married to my cousin. My eldest child has a serious genetic disorder but my younger child is healthy. If cousin marriage is related to genetic conditions, why is one son okay and the other is not?**

The parents being cousins is not the reason that their child is born with a disability. **If the genetic disorder is a recessive disorder** that means there is a gene for a recessive disorder in the family and both parents have

inherited this gene. In this case, the older child must have inherited the gene from both mother and father.

There are two possibilities for the younger child. First, the child may be a healthy carrier like the parents, having inherited one usual and one unusual gene. Secondly, the child may have inherited a usual gene from each parent and therefore is neither affected nor a carrier. Being cousins just increases the chance that both parents would inherit the gene for the disorder in the family and be a carrier couple.

### **My husband and I are not cousins. In fact, we are not even related, but my child has a genetic disorder. Why is my child affected?**

Genetic disorders can affect anyone. Every couple, including those who are not related, has a small chance of having a baby with a genetic disorder. Research from Born in Bradford shows that for every 100 babies born to unrelated couples, fewer than three have a birth disorder (a problem that a baby has from birth). For every 100 babies born to closely related couples, five to six have a birth disorder. This increase is mainly because of recessive disorders which are one type of birth disorder.

### **Is there someone I can speak to if I have concerns about possible genetic disorders in my family?**

Yes. If you are concerned about a genetic disorder in your extended family or your partner is a blood relative and you are concerned about possible effects for your children, or you are thinking of having a partner who is a blood relative, please speak to your GP. He/she will be able to offer advice and may refer you to local genetic services for expert help.

### **What could I be offered through genetic services?**

Genetic services have specifically trained staff (genetic counsellors) who will answer your questions and address your concerns. They are able to provide information on whether a person could be a carrier or whether a couple could be at risk of having a child with a genetic disorder. The counsellors support individuals and couples with an increased genetic risk to understand that risk and what it could mean for them and their families. They may also be able to offer tests (genetic testing) for a particular disorder.

Genetic testing may be available for some but not all genetic disorders. However, new tests are increasingly becoming available.

Some counsellors also speak other languages as well as English. Speak to your GP if you would like to see a genetic counsellor.

### **I want to know more about this important issue but I want to understand the religious and moral aspects, alongside the scientific evidence.**

Thinking about marriage and having children raises religious and moral questions for many people. In Bradford we have chaplains who are familiar with the information in this leaflet and genetic services, who can offer advice and support to everyone seeking information and help:

**Mohammed Arshad (Head of Chaplaincy)**

**Tel: 01274 365819**

**Email: Mohammed.arshad@bthft.nhs.uk**

**Shaheen Kauser (Female Chaplain)**

**Email: Shaheen.Kauser@bthft.nhs.uk**

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