

## What are Genes?

Genes are the unique set of instructions inside our bodies which make each of us an individual. There are many thousands of different genes, each carrying a different instruction. If a gene is altered, it can cause a genetic condition or disease.

A gene alteration is sometimes known as a 'mutation'.

We have two copies of each gene. One copy is inherited from each of our parents. When we have children, we pass on only one copy of each of our genes.

## What does Recessive Inheritance mean?

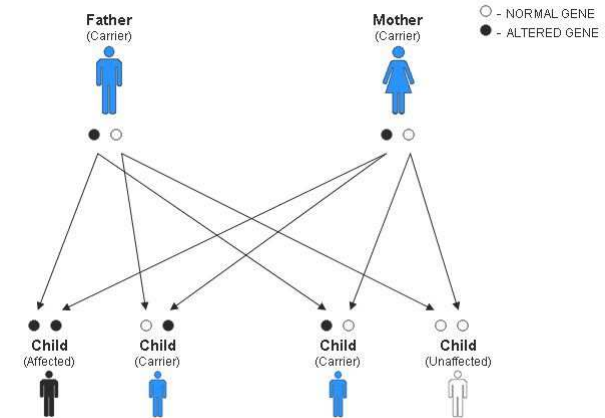
Some conditions are inherited in a recessive way. In recessive conditions, only individuals who inherit **two** altered copies of the gene (one from each parent) will be

affected by the condition.

Individuals who inherit only **one** altered copy of a gene will not have the condition. They are known as 'carriers'. Their healthy copy of the gene compensates for the altered copy of the gene.

## Having children

The diagram below shows a recessive pattern of inheritance.



If **both** healthy parents carry an alteration in the same gene each child they have has

- a 25% (1 in 4) risk of inheriting the altered gene from both parents and therefore being affected with the condition.
- a 50% (1 in 2) chance of inheriting one copy of the altered gene from one of their parents. If this happens, they are healthy carriers themselves.
- a 25% (1 in 4) chance that a child will inherit two healthy copies of the gene. These children will not be affected with the condition and not at risk of passing on the altered gene to their children.

For each child, regardless of their sex, the risk is the same.

If **only one** parent is a carrier of the altered gene, then each of their children has a 50% chance of being a healthy carrier, but will not be affected with the condition.

Parents who are closely related to each other, such as first cousins, are more likely to have children with recessive conditions.

## Further information

### Your local genetics service:

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# Recessive Inheritance

## Information for patients

