

Recessive Inheritance

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 contains a disease-causing (pathogenic) alteration, it can cause people to have an increased chance of developing a genetic condition. A gene alteration is sometimes known as a gene variant.

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, individuals who have only one altered copy of a gene are completely healthy. They are known as carriers of the condition because they carry one altered copy of a gene. Their typical copy of the gene keeps them healthy and compensates for the altered copy of the gene.

Having children

If both healthy parents are carriers of the same altered recessive gene, then each child they have has a 25% (1 in 4) chance of inheriting the altered gene from both parents and therefore being affected by the condition. For each child, regardless of their sex, the chance is the same = 25%.

Children of couples who are both carriers of the same altered recessive gene have 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. There is also a 25% (1 in 4) chance that a child of a carrier couple will inherit two typical copies of the gene. These children will be unaffected by the condition in the family.

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 they will not be affected by the condition.

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

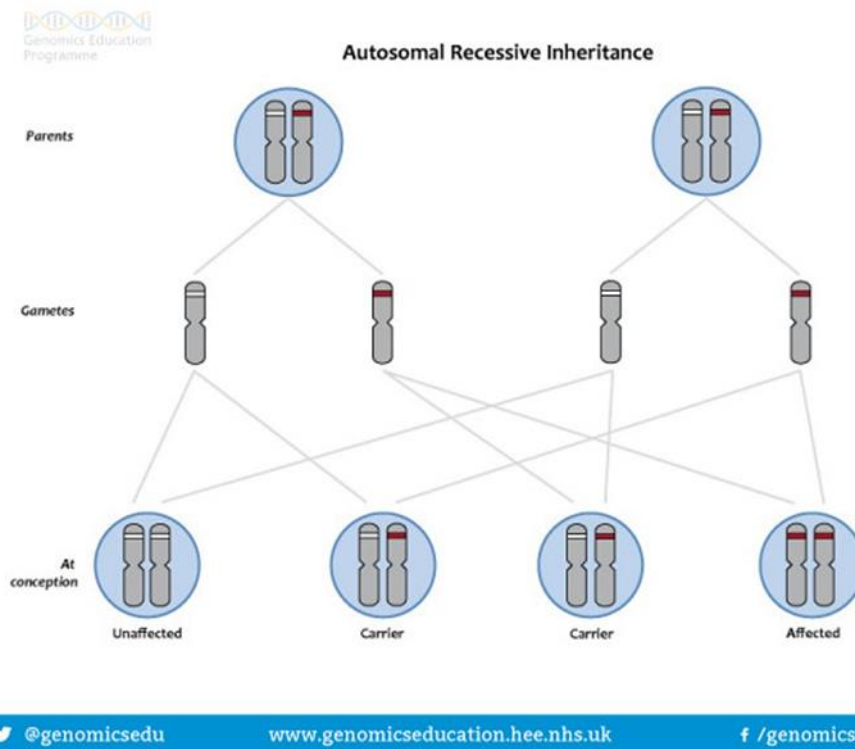


Image source: <https://www.genomicseducation.hee.nhs.uk/image-library/>

Further information regarding autosomal recessive inheritance is available at: <https://www.genomicseducation.hee.nhs.uk/genotes/knowledge-hub/autosomal-recessive-inheritance/>

If you need more advice about any aspect of Recessive Inheritance, you are welcome to contact:

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This leaflet can be made available in different formats on request. If you would like to make any suggestions or comments about the content of this leaflet, then please contact the Patient Experience Team on 0151 702 4353 or by email at pals@lwh.nhs.uk

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