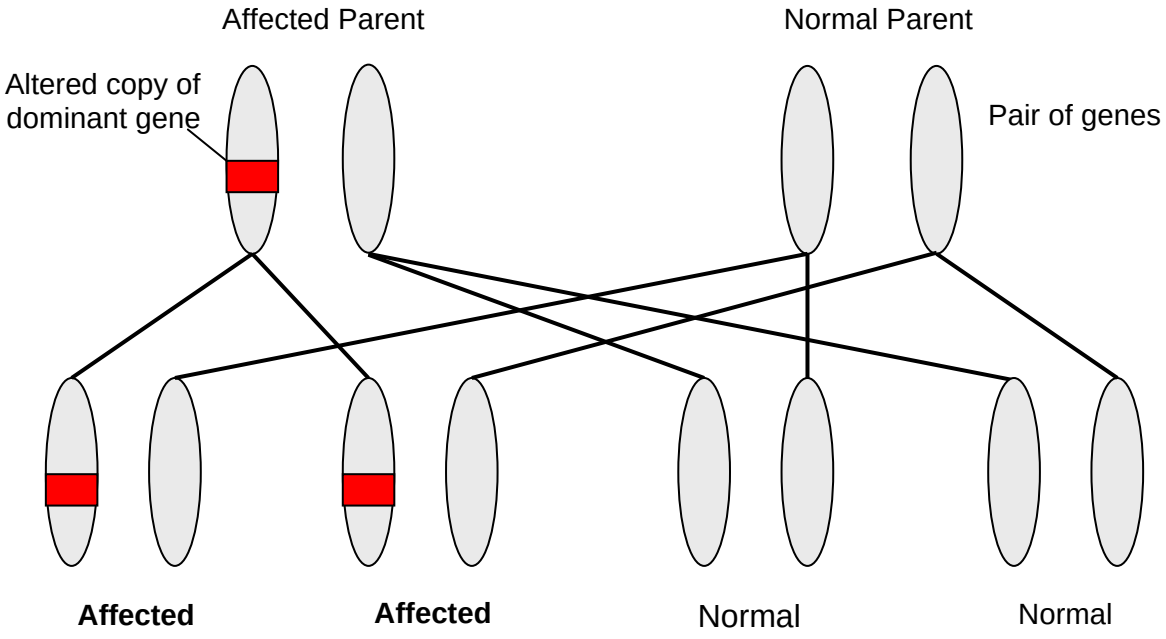
North East Thames
Regional Genetics Service

Dominant Inheritance

Genes are the unique set of instructions that determine how our bodies develop and function. There are many thousands of different genes, each carrying a different instruction. If a gene is altered, this can lead to a genetic condition or disease. Each cell in the body contains a complete set of instructions, about 25,000 pairs of genes in total. They are inherited from both of our parents. One copy of each pair of genes comes from each parent. We inherit an entire set of genes from our mother, in the egg and an entire set from our father, in the sperm.

Some conditions are inherited in a dominant pattern of inheritance. These conditions arise if a person has an altered copy of one gene. They are called dominant because the altered copy of the gene has a dominant effect over the normal copy of the same gene. The picture below shows what happens when a person with dominant genetic change has children. The dominant change in one of the genes is shaded.



If the father is the parent with the dominant genetic change, 50 per cent of his sperm will contain the gene with the change, and 50 per cent will contain the normal gene. When a baby is made there is a 50:50 chance it will either come from a sperm with the gene change (and be affected) and a 50:50 chance it will come from a sperm with an unchanged gene. The same applies if the mother is affected because 50 per cent of her eggs will contain the gene with the change, and 50 per cent will contain the normal gene. There is therefore a 50:50 chance of the child being affected regardless of the sex of the baby or the sex of the affected parent.

A person with dominant condition therefore has a 50:50 chance of passing on the dominant genetic change each time they have a child. If the condition is inherited in this way, a parent is often affected (as well as other family members) such as grandparents or aunts/uncles. Dominant conditions may be quite variable (i.e. some people may be profoundly affected and others may have very mild features of the condition). Sometimes a dominant change in a gene occurs for the first time in the sperm or the egg, in which case there is no family history and the affected child is the first person in the family to have the condition.

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