X-linked inheritance of genes

Genetics Department

Information for Patients

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What are genes?

Genes are the unique set of instructions inside our bodies which make each of us an individual. There are many different genes, each carrying a different instruction.

We have 2 copies of each gene. 1 copy is passed on (inherited) from each of our parents. When we have children, we pass on only 1 copy of each of our genes. We cannot control which copy of our genes we pass on.

If a gene is changed, it can cause a genetic condition or disease. This gene change is sometimes known as a ‘variant’. It used to be known as a ‘mutation’.

What does X-linked inheritance mean?

A woman has 2 X chromosomes. A man has 1 X chromosome and 1 Y chromosome.

X-linked conditions happen when a gene change is located on the X chromosome.

If a woman has a changed gene on 1 of her 2 X chromosomes, she is called a ‘female carrier’. A female carrier will be healthy, as she has a normal copy of the gene on her other X chromosome. It is very unusual for a changed gene to affect the health of a female carrier.

If a man has an altered gene on his X chromosome, he will be affected with the condition. He does not have a second X chromosome with the normal copy of the gene.

Having children

If a female carrier has a boy, there is a 50% (1 in 2) risk that the boy will get the changed gene. If this happens, he will be affected by the condition.

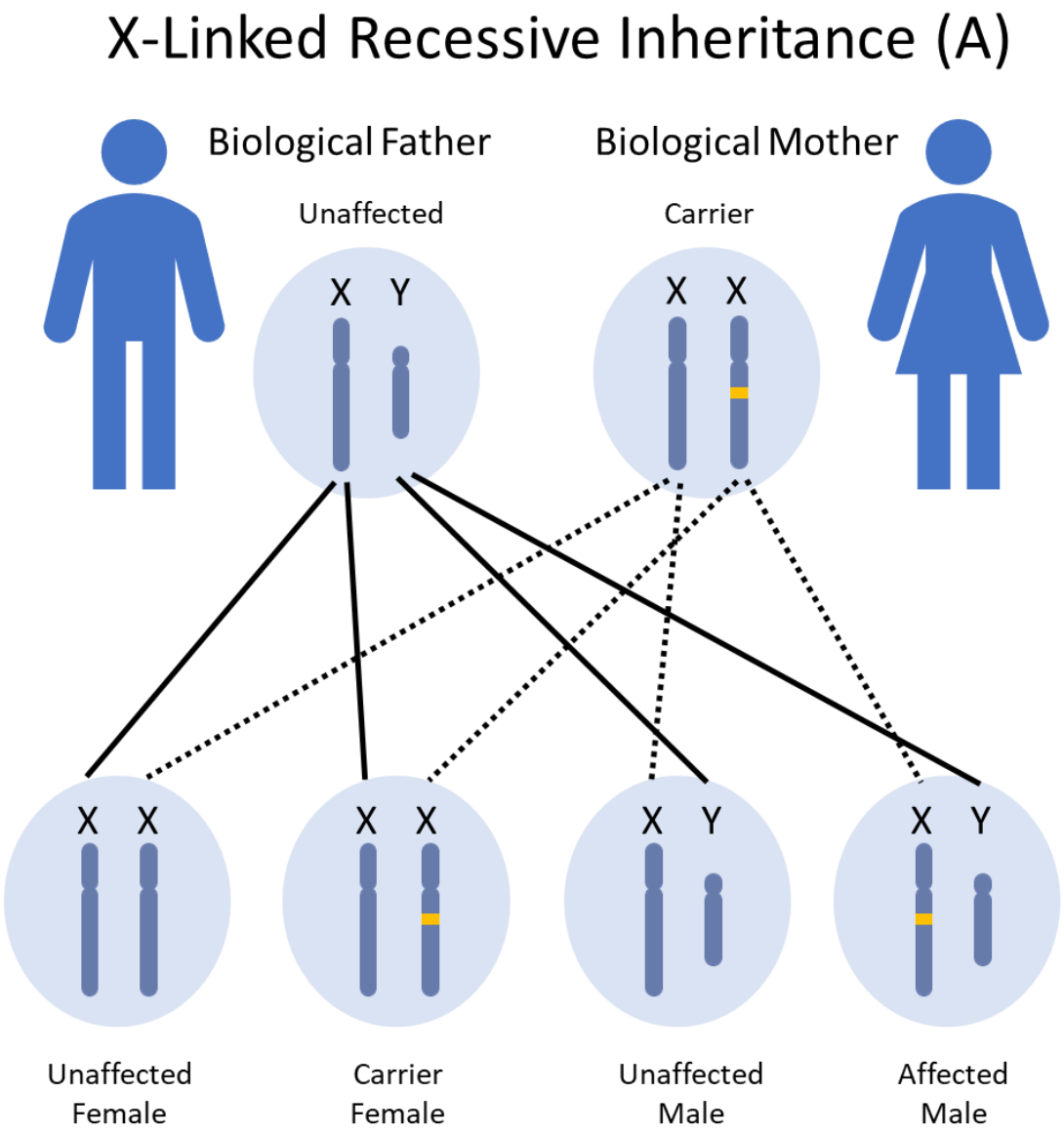
If a female carrier has a girl, there is a 50% (1 in 2) risk that the girl will get the changed gene. If this happens, she will be a healthy female carrier, like her mother.

When men who are have X-linked conditions have children, all of their daughters will get the changed gene on their X chromosome. These daughters will all be healthy female carriers.

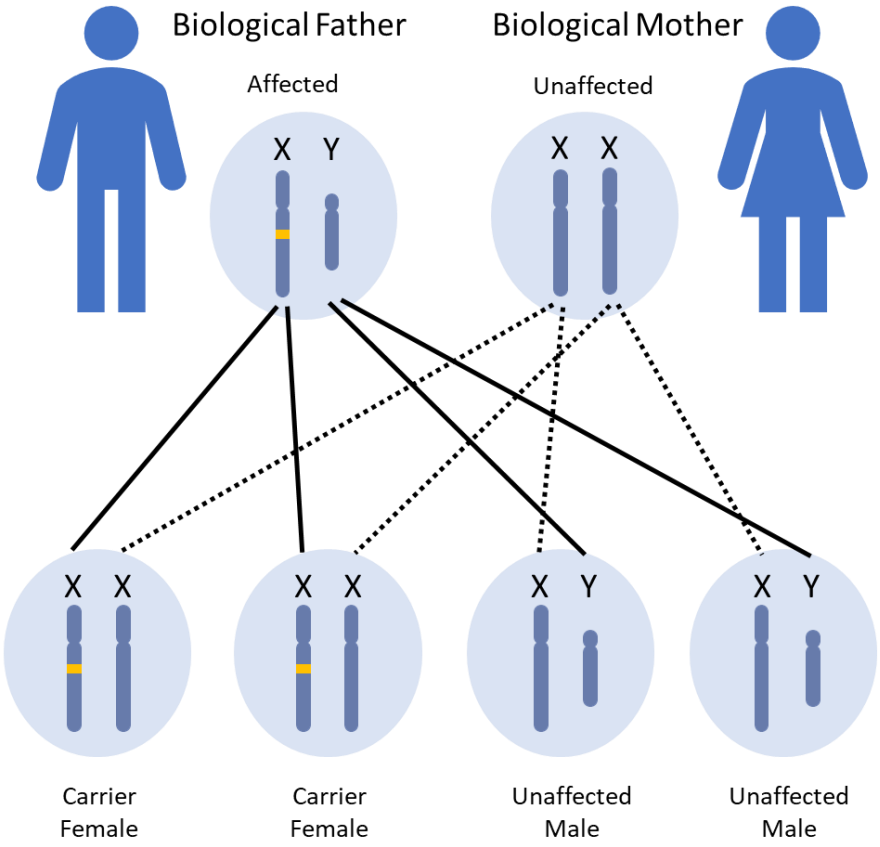
Men do not pass on their X chromosome to their sons. All the sons of men with X-linked conditions will be unaffected.

Sometimes boys can be born with an X-linked condition even though their mothers are not carriers.

It is very important to get specialist advice in future pregnancies in X-linked conditions, as carrier testing may be available.



X-Linked Recessive Inheritance (B)



Where can I learn more?

Contact - a charity that provides advice and support for families with disabled children

Website: contact.org.uk Free helpline: 0808 808 3555

Helpful Videos

www.youtube.com/watch?v=aPdkUQhcxds

www.youtube.com/watch?v=YE06-1fSclI

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Previous reference: unknown

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