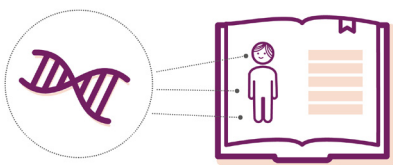


Genes and MS

Five things to know

- 1** MS is not directly inherited
- 2** MS can happen more than once in a family, but it's much more likely this will not happen
- 3** Genes are only part of the reason someone gets MS
- 4** There's no single gene that causes MS
- 5** Genetic research could help prevent, treat and even cure MS

What are genes?



Genes are instructions for our bodies. They're a code that's passed on from our parents.

They influence things like our height and hair colour. They can also affect our chances of developing certain health conditions, including MS.

Is MS in my genes?

Yes and no. Genes do play a role in MS, but they're only part of the story.

There's no single gene that will definitely cause someone to get MS. But we know that having certain genes can make a person more likely to get MS.

Identical twins

Identical twins have the same genes, but if one gets MS, the other usually doesn't.

For every 1000 people who have an identical twin with MS, 180 will get MS (820 won't).



If genes were the only thing deciding who got MS, identical twins would always either both get MS or neither would.

Environmental and lifestyle factors

Most people who've got genes linked to MS won't get the condition.

So what's going on? Well, other things also play a part: often called environmental and lifestyle factors.

These are things like infections, levels of vitamin D, and smoking. They've all been shown to play a role in developing MS.

Triggers

Genes mean that someone can get MS, but not that they will. Something triggers MS.

It might be a combination of different environmental and lifestyle factors. It might vary from person to person.

This is a big area of research, because when we find the triggers we can stop MS before it starts.

MS in the family - what are the chances?

MS isn't passed directly from parents to their children - because it isn't caused by a single gene. While MS can occur more than once in a family, it's more likely that this won't happen.

We can work out the chances of relatives developing MS by looking at the history of MS in families around the world.

For every 1000 people...

...who grow up in the UK **about 3**
will get MS
(997 won't)

...with a parent with MS **about 15**
will get MS
(985 won't)

...with a brother or sister with MS **about 27**
will get MS
(973 won't)

Is gene therapy a treatment for MS?

Gene therapy aims to treat or prevent a condition by adjusting genes - instead of using drugs or surgery.

There's no gene therapy yet for MS, but it's a possibility in the future.

Research into genes and MS can help us:

- understand why certain people are more likely to get MS
- discover ways to reduce the risk of getting MS
- explain why some people with MS respond to treatments, while others don't
- develop new treatments targeting particular genes

This kind of approach has been successful for diabetes, another condition where lots of genes are involved.

Is there a genetic test for MS?

Not one that can give a simple, clear answer to: 'Will I get MS?'

Even a test that could show all the genes involved wouldn't be enough on its own to answer this. Having genes linked to MS doesn't mean you will get MS.

In the future, it's possible that genetic tests could help people know their own chances of getting MS. Researchers at Harvard University in the USA are looking into this already.

MS genetic research has already discovered

- Over 200 genes are linked to MS – lots of them play a role in the immune system, and some are linked to other autoimmune conditions
- Some genes are linked to both MS and vitamin D – in a study, people with four particular genes had lower levels of vitamin D and were more likely to get MS
- Another gene linked to MS becomes more active when vitamin D levels increase
- Genes that raise the risk of being overweight have also been linked to MS – this genetic research backs up other studies that noticed a link between obesity and the risk of MS

Genetic research we're funding and supporting

We're funding projects to understand the role genes play in MS:

- identifying who will benefit most from beta-interferons
- discovering why some MS progresses and some doesn't
- developing techniques to repair people's damaged myelin

Find out more about all these areas of research, and the latest research news at:

mssociety.org.uk/research

Find out more

Visit our website for information on living with MS, including our booklets **Just diagnosed** and **What is MS?** in a number of languages.

There are also:

- tips on talking about MS to children, friends and family
- information about having a baby if you or your partner have MS

If you want details of the scientific documents that support this factsheet, call 0300 500 8084.

We're the MS Society. Our community is here for you through the highs, lows and everything in between. We understand what life's like with MS. Together, we are strong enough to stop MS.

The MS Society provides this information free of charge but if you would like to help cover the cost, which will help towards our essential work, please call **0800 100 133** or visit the fundraising section of our website to make a donation. Anything you can give will be greatly appreciated.

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