

Dimethyl fumarate (Tecfidera)

This factsheet is about dimethyl fumarate, a disease modifying therapy (DMT) for relapsing multiple sclerosis (MS). At the end of this factsheet you'll find out where you can get more information on this drug, other drugs for MS and the benefits of early treatment.

This factsheet doesn't cover everything about this drug and shouldn't be used in place of advice from your MS specialist team. For more information speak to them and read the online information from the drug's makers (see the section **More information and support**).

What is dimethyl fumarate?

In 2012 a trial showed that a drug called BG-12 used for psoriasis, a skin problem, also worked against MS.

In 2013 it was given the new name of dimethyl fumarate (DMF) and a licence to be used in the UK to treat relapsing MS. In 2014 the National Institute for Health and Care Excellence (NICE) gave the go ahead for the drug to be used on the NHS.

Dimethyl fumarate is pronounced: dye-METH-ul FUME-er-ayt.

Its brand name is **Tecfidera** (teckfer-DAIR-ah).

Can I have this drug?

Dimethyl fumarate is recommended for the treatment of 'active' relapsing MS, defined in guidelines as two or more relapses in the last two years.

But more and more MS specialists define 'active' MS as one recent relapse and/or signs on

MRI scans that MS is active. These signs include new 'lesions' (areas of damage) in your brain.

So you can take dimethyl fumarate if you have:

In **Scotland, Wales** and **Northern Ireland**:

- relapsing MS and you've had a recent relapse and/or MRI scans show new signs that your MS is active (you have new 'lesions')

In **England** you can have this drug if:

- you've had two relapses in the last two years

Whether you'll be offered this drug depends on if you qualify for it based on guidelines used by your neurologist. These come from the Association of British Neurologists (ABN) and NICE. In England there are rules from NHS England about who can have the different DMTs and when. Scotland, Wales and Northern Ireland also have their own guidelines for many DMTs.

If you can have a drug also depends on whether the NHS where you live will pay for it. NHS guidelines on this tend to follow what NICE says.

You won't get this drug if:

- your MS has gone beyond 'active' (it's now 'highly active' or severe and getting worse fast)
- you're already on another DMT that's controlling your MS well. You can't take more than one DMT at a time
- you have progressive MS

Dimethyl fumarate won't work if you don't get relapses. So you won't be offered it if you have primary or secondary progressive MS. But several drugs are now being tested to see if they work against these non-relapsing, progressive types of MS.

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You might not be able to take this drug if you have some health conditions. So tell your MS specialist your full medical history, including any other health problems and medications you're taking.

If you're a woman trying to have a baby, or not using contraception, you should discuss with your neurologist if there's any risk this drug might pose to your baby if you become pregnant (see the section **What side effects might I get?**).

How do I take it?

Dimethyl fumarate is a tablet you take twice a day. Taking it with food may help reduce some of its side effects.

How does it work?

Your immune system fights off infections. But with MS it attacks the nerves in your brain and spinal cord by mistake.

This leads to inflammation and damage, especially to the coating that covers your nerves (myelin).

This damage interferes with how signals travel along these nerves. Over time this affects your control over many parts of your body and causes symptoms of MS.

We don't know exactly how dimethyl fumarate works, but studies show it may help to prevent the inflammation that causes damage in your brain and spinal cord.

It also seems to dampen down the reaction of your immune system and protect nerves from damage.

How well does it work?

When DMTs, including dimethyl fumarate, are working well you have:

- fewer and less serious relapses
- fewer new or bigger 'lesions' (or 'plaques') in your brain and spinal cord (lesions can be seen on MRI scans)
- a slowdown in your disability getting worse

Like other DMTs, dimethyl fumarate works best the sooner you start it after you're diagnosed with MS.

Taking it later can also have benefits but it can't undo any permanent disability you may already have.

DMTs can be split into three groups, according to how big their effect can be.

High (they can work very well):

- alemtuzumab (Lemtrada)
- natalizumab (Tysabri)
- ocrelizumab (Ocrevus) when used for relapsing MS*
- haematopoietic stem cell transplantation (HSCT)

Good (they can work well):

- cladribine (Mavenclad)
- **dimethyl fumarate (Tecfidera)**
- fingolimod (Gilenya)

- ocrelizumab (Ocrevus) when used for relapsing MS*

Moderate (they can work fairly well):

- glatiramer acetate (Copaxone and Brabio)
- five different beta interferons (Avonex, Betaferon, Extavia, Rebif and Plegridy)
- teriflunomide (Aubagio)
- ocrelizumab (Ocrevus) when used for early primary progressive MS

*ocrelizumab is new, so it's too soon to be sure how to rank it when it's used for relapsing MS. It'll either be 'high' or 'good', so we've put it under both.

The effectiveness of dimethyl fumarate is classed as 'good'



Relapses dropped by: 53% compared to placebo

This means that in one trial, on average, people saw a 53% drop in the number of relapses they had. This was compared to people who took a placebo, a dummy pill with no drug in it.

How many people stayed free of relapses when they took this drug?


Trial one

73% of people who took dimethyl fumarate stayed free of relapses for two years.



54% of people who took the placebo stayed free of relapses.



 = no relapses

Trial two

71% of people who took dimethyl fumarate in another trial stayed free of relapses over two years.



59% of people who took the placebo stayed free of relapses.



Disability getting worse was slowed down by: **38% compared to a placebo**

This means that in one trial, on average, people saw a 38% drop in the risk of their disability getting worse. This was compared to people who took a placebo.

How many people's disability didn't get worse when they took this drug?

Trial one

Disability didn't get worse over two years for 84% of people who took dimethyl fumarate



Disability didn't get worse for 73% of people who took the placebo



= disability didn't get worse

In the second trial 87% of people who took dimethyl fumarate saw no worsening of their disability compared to 83% of people who took a placebo. This difference isn't big enough to be statistically significant (it might have happened by chance, not because of the drug).

The figures here on relapses and disability come from two studies: the 2012 DEFINE study over two years of 1,234 people, and another 2012 study of 1,417 people over two years called CONFIRM. This last study came up with similar results to the first, including (for the twice a day dose people normally take) a 44% drop in relapse rate and 21% reduction in disease progression compared to a placebo.

Dimethyl fumarate might work much better for you than these average results - or it might not work as well.

What side effects might I get?

Like all drugs, dimethyl fumarate can have side effects, but not everyone gets them. Not many people stop taking this drug because of side effects.

The more effective a DMT is, the more risk of serious side effects. Dimethyl fumarate is somewhere between the less effective drugs with fewer side effects (beta interferons and glatiramer acetate) and the harder hitting drugs with more serious ones (alemtuzumab and natalizumab).

Some DMTs might harm unborn babies but there's no evidence dimethyl fumarate does this.

But until we know more about possible risks, it's recommended that you don't become pregnant while on this drug. Use effective contraception like condoms or 'the pill'.

Stomach upsets are a common side effect for a few weeks after starting this drug. This could stop a woman's body properly absorbing oral contraceptives like 'the pill'. Until this symptom goes away, doctors advise also using extra contraception such as condoms. For more information on getting pregnant see **I want a child. Can I take dimethyl fumarate?**

At the beginning of treatment side effects are common but tend to become less as time goes on. Your neurologist, GP or MS nurse can give you advice about ways of dealing with side effects.

The most common side effects

(in one study up to four out of ten people had one or more of the following)




- flushing and feeling hot (around a third of people get this). Aspirin can help
- diarrhoea or upset stomach (half get this to begin with but only around one in ten still have this three months later)
- feeling sick
- headache
- a drop in your white blood cells (a part of your immune system). This could leave you more open to infections but in one trial people got about the same number of infections as people not taking the drug. This drug could leave you open to a very rare brain infection, PML (see box below).

Itchy skin or a rash is another common side effect. Side effects usually go away after a few weeks (in one study after the first month only one person in 20 still had them). Taking dimethyl fumarate with food helps reduce side effects. If you think you might have a serious infection, talk to your doctor straight away.

Up to one in 100 people can have a serious allergic reaction to dimethyl fumarate. Stop taking the drug straight away and call a doctor if you become flushed and get swelling of your face, lips, mouth or tongue and/or wheezing, have difficulty breathing or shortness of breath. In **More information and support** you'll find where you can get a full list of all possible side effects and other information about this drug.

Side effects: weighing up the risks of DMTs

Only you can decide what level of risk you're happy to take. You'll need to weigh up:

-  possible risks against the benefits you could enjoy
-  taking a DMT with fewer side effects but less impact, against a DMT with better results but more maybe serious side effects
-  the risk of not being treated

This last point has recently become clearer. We now know that damage could be taking place in your brain between relapses, when it might seem like nothing is happening with your MS. Before deciding, talk to others and get the information you need. Some ideas are in **More information and support**.

What tests will I need?

Dimethyl fumarate may affect your kidneys and liver and how many white blood cells you have. So you'll have blood tests before and during treatment to check for this.

As part of your treatment ABN guidelines say it's a good idea to have MRI scans to see how well the drug is controlling your MS.

PML: a very rare but serious side effect

Dimethyl fumarate can increase your chances of getting a rare brain infection, PML (progressive multifocal leukoencephalopathy). PML often leaves people seriously disabled or kills them. PML is caused by the JC virus. Over half of people with MS have this virus. Our immune system normally stops it causing us problems but dimethyl fumarate changes the immune system, allowing this virus to become active.

The risk is extremely small. As of May 2018 five people have got it out of over 230,000 across the world taking dimethyl fumarate. A blood test will show if you have the JC virus. Your health care team will tell you what to look out for and do if you notice signs of PML. These include clumsiness, weakness on one side and changes in your speech, vision or memory and thinking.

When should I stop taking this drug?

Dimethyl fumarate is meant to be taken long term. If this drug is controlling your MS well and side effects aren't a problem, you should be able to take it for years. A study of people taking it for six years and longer shows it keeps working and has no risks that we didn't already know about.

Your neurologist might recommend you switch from dimethyl fumarate to another DMT. This can happen if you have bad side effects or the drug isn't controlling your MS. Switching drugs usually only happens after you've taken a drug for six months.

You'll need to stop taking dimethyl fumarate if your MS changes to secondary progressive MS. DMTs available now can't help people if they don't have relapses. But clinical trials are underway testing drugs for progressive, non-relapsing forms of MS.

If you're a woman thinking about getting pregnant or you become pregnant, discuss with your neurologist whether they think you should stop taking dimethyl fumarate (see the next section for more details).

I want a child. Can I take dimethyl fumarate?

There's no evidence that dimethyl fumarate harms unborn babies. But until there are more studies, pregnant women are recommended not to get pregnant when on this drug, and to use effective contraception (condoms or 'the pill').

Women who've had a baby are more likely to have a relapse in the first six months after the birth. So if you do stop taking this drug in order to get pregnant, it's recommended you restart it soon after giving birth.

If you stop, you should wait until the amount of the drug in your body drops to a certain level. The time this takes is called the 'washout period'. There's no set period for dimethyl fumarate, although doctors might recommend a month or less. Blood tests will check that the level of drug in your blood has dropped low enough.

If you get pregnant, doctors will recommend you keep taking DMF only if the benefit to your MS is bigger than any possible risk to your baby. Your neurologist will advise you about whether to switch to another drug.

We don't know if this drug gets into breast milk or if this is dangerous. So it's recommended that you don't breastfeed when taking DMF. Men and women with MS who would like to have a child should discuss this with their neurologist. Talk to him/her if you're a woman and you think you may be pregnant.'

More information and support

mssociety.org.uk/earlytreatment

On this web page you'll find more about treatment, a report on the evidence for early treatment and links to our basic guide to DMTs and factsheets on other DMTs.

New guidelines say everyone should have a review of their MS and treatment with a specialist at least once a year. But if you're not happy with the treatment you're offered, find tips about what to do here: mssociety.org.uk/about-ms/treatments-and-therapies/getting-treatments-for-ms

Elsewhere on the MS Society site you'll find the latest updates on research into drugs for the different types of MS.

Patient information leaflets

Every DMT comes with detailed information about doses, how to store and take it, side effects and results from trials. Find the one for this drug at medicines.org.uk and search for 'dimethyl fumarate' or 'Tecfidera'. The circle with 'PIL' on it has information written for patients. The circle with 'SPC' on it has information for doctors.

Your MS specialist team

Your neurologist, MS nurse and other members of your specialist team can give you information and support, as can your GP often. MS nurses, if you have one where you are, can be especially helpful if you need support taking a DMT.

mssociety.org.uk/forum

On this and other online forums you can talk to others thinking about treatment or already taking it.

Helpline: 0808 800 8000

About this resource

With thanks to Louise Coghlin and all the neurologists and people with MS who contributed to this factsheet.

Disclaimer: We have made every effort to ensure that the information in this publication is correct. We do not accept liability for any errors or omissions. Availability and prescribing criteria for drugs in various parts of the UK may change. Be sure to seek local advice from the sources listed.

Let us know what you think

If you have any comments on this information or on the work of the MS Society, please send them to resources@mssociety.org.uk.

References

A list of references is available on request. Call 0300 500 8084.

Further information from the MS Society

Resources

Our award winning information resources cover every aspect of living with MS.

☎ 0300 500 8084

✉ shop@mssociety.org.uk

🖥 www.mssociety.org.uk/publications

Helpline

The Freephone MS Helpline offers confidential emotional support and information for anyone affected by MS, including family, friends and carers.

Information is available in over 150 languages through an interpreter service.

☎ 0808 800 8000 (closed weekends and bank holidays)

✉ helpline@mssociety.org.uk

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Together, we are strong enough to stop MS.

Contact us

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MS Helpline

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- Posting your donation to: MS Society, National Centre, 372 Edgware Road, London NW2 6ND.
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This factsheet will be reviewed within three years of publication.

