

## Diet and supplements



Multiple sclerosis information

# Welcome to this Choices booklet about diet and supplements

MS-UK believes in listening to the voices of people affected by multiple sclerosis (MS) to shape the information and support we provide. It is these people that bring us perspectives that no one else can give.

For every Choices booklet we produce, MS-UK consults the wider MS community to gather feedback and uses this to inform our content. All of our Choices booklets are then reviewed by the MS-UK Virtual Insight Panel before they are published.

This Choices booklet has been designed with you in mind. We hope it will answer some of your questions and provide some first-hand experience from those who have been in your position - people who can truly understand and empathise with your current thoughts and feelings.

**Every time you find bold text with quotation marks like this, it is a quote directly from someone affected by multiple sclerosis**

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# Introduction


A well-balanced, healthy diet is important for everybody to maintain optimum health (1). What we put into our bodies, the fuel we use to power us is important as it will impact our overall state of health. A poor diet with limited nutritional value is known to be a major conducive risk in the onset of serious ill health issues and diseases (2).

**I have had MS for 25 years. In the last five years, my symptoms have worsened, making secondary progressive MS (SPMS) the likely diagnosis. Nevertheless, I am still eating a healthy diet, taking supplements and making it to the gym regularly. I am fairly sure my continued diet, supplementation and exercise have had a significant positive impact on my wellbeing and fitness over the last two decades**


Recent government figures show that only 29% of adults in the UK are consuming the recommended five portions of fruit and vegetables daily. But concerningly, on a worldwide scale, the UK compares favourably to most Organisation for Economic Co-operation and Development (OECD) member countries in relation to an individual's daily fruit and vegetable intake. Therefore, much work is still needed to ensure that more people around the globe

have access to these fundamental sources of vitamins and minerals (2).

Many people diagnosed with multiple sclerosis (MS) have questions about whether changes to their diet and nutrition can assist in symptom management. In line with this, a recent study using information from nearly 7,000 people with MS from North America has concluded that a healthy lifestyle and diet have a positive association with disability and symptoms. The data from this study shows a convincing correlation between poor diet and disability (3).



**There have been all-round benefits to my overall health from the changes I have made to my diet. I never catch colds and my IBS [irritable bowel syndrome] and gastric troubles of the past have never returned. If I accidentally eat dairy or gluten my stomach is immediately very upset and my MS fatigue and clumsiness worsen**



A separate study of just under 1,350 participants, all of whom were affected by MS, looked at the relationship between the quality of diet and the causation of fatigue, depression and disability progression. The study concluded that a good quality diet, particularly one which is low in fats and processed meats, had a

positive impact in all three of these areas (4).

From set diets, anti-inflammatory foods, to supplementary aids, this booklet looks at how what we eat can have a positive influence on our body's ability to stay healthy and help us to manage the impact of MS.

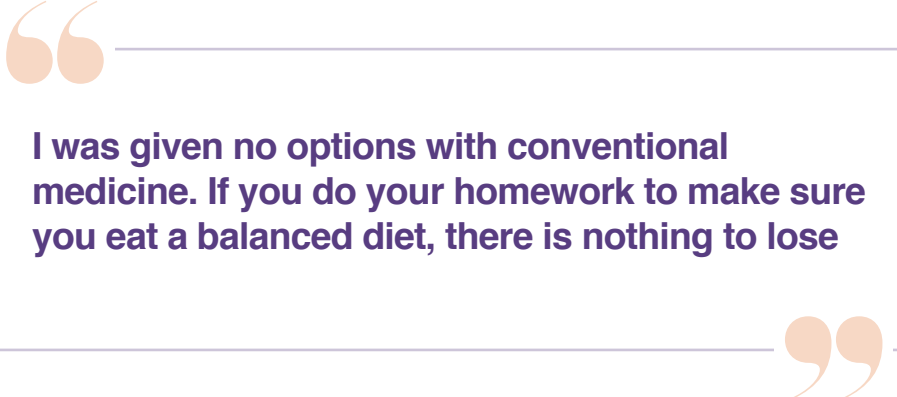
**I have been influenced to make diet and lifestyle changes after reading the Brain Health campaign by Professor Gavin Giovannoni**

## **Making dietary changes**

Making dietary changes can be challenging for a wealth of reasons, such as affordability and lack of convenient access to fresh, healthy foods (5). Our increasingly busy lifestyles also pose significant barriers when it comes to eating more healthily, along with confusing information regarding healthy diets (6). That said, there is evidence that over recent times the increasing clarity of nutritional value labelling on foods within the UK has aided people in distinguishing the good from the bad, helping them to make healthier dietary choices (7).

It is important to stress that there is no 'one size fits all' approach when it comes to making dietary changes. Some of us like to go 'all

in' and make these changes in full straight away, whilst others may prefer to make adaptations more slowly over time. Similarly, some of us like to follow set dietary plans, whilst others are happy to employ a more bespoke, informal and flexible approach. Do what is right for you - what you feel comfortable with. Make changes that are compatible with you and your lifestyle. Avoid adding further stress to your lifestyle by setting yourself unrealistic goals as this can be counterproductive.



**I was given no options with conventional medicine. If you do your homework to make sure you eat a balanced diet, there is nothing to lose**

The NHS guide to a balanced diet provides a solid foundation for you to start making fundamental changes to your dietary habits (1). The British Nutrition Foundation also provide good clear advice to help with understanding food nutrition labelling within the UK (8).

A Dietician can provide you with expert assistance in formulating and implementing a healthy, suitable, and realistic dietary plan. Dieticians can be accessed via the NHS or privately.

**It is recommended that you consult your GP, neurologist, or MS nurse before starting to take any supplements or making any significant changes to your diet.**

**A lot of people dismiss the power of diet. The advice I would give to others with MS is to try a diet and see if it helps them. I would also recommend that you give the diet adequate time, don't quit too early and listen to your body**

## **MS and the gut microbiome**

### **What is the gut microbiome?**

The human Gastrointestinal (GI) tract is made up of a series of organs running from our mouths to the anus. Constituent elements of our GI tract include the oesophagus, large and small intestines and our stomach. Within our GI tract live a plethora of bacterial organisms, known as gut microbiomes, which play a vital role in ensuring that our bodies stay healthy.

There is often a misconception that all bacteria are harmful to humans and pose a threat to our health. Interestingly, there are more bacteria that establish symbiotic relationships with us, than microbes that cause ill health. The microbiomes found inside our GI tract work in conjunction with our nerves, blood and wider digestive system to ensure efficient digestion of consumed food and liquids. This complex collaborative process allows our bodies to absorb nutrients which promote our growth, energy production, a healthy immune system and cell repair (9).



Every one of us has a unique gut microbiome make-up that is influenced by a number of factors, including genetics, use of medications and antibiotics, our diets and age. This microbial process begins as soon as we are born and evolves throughout our lives.

## **The link between gut microbiome and MS**

In recent times there has been an increase in the number of studies focusing on connecting the gut microbiome with cases of central nervous system autoimmunity. The resultant evidence suggests the presence of microbial imbalances in the gut of people affected by MS and other autoimmune diseases. These imbalances are known as ‘dysbiosis’ and can lead to bacteria escaping from the GI tract via the intestinal barrier and leaking into the bloodstream, with the effect being an increase in inflammatory influences on the central nervous system (10).

It is thought that dysbiosis leads to changes in the makeup of the intestinal barrier, making it less effective in preventing bacterial leakage. It therefore follows that medical science is becoming increasingly interested in the relationship between dysbiosis and the onset of MS, with a focus on intestinal barrier restoration as a means of impact reduction (11).

Interestingly, a recent study has found further evidence that changes to the gut microbiome play a role in the development of MS. Scientists at the New York School of Medicine found that newly diagnosed people who had not yet begun to use disease modifying therapies, regardless of their ethnic background, had a high concentration of the bacteria group Clostridia compared with people who do not have MS. What makes this study particularly significant is that the participants had not used any disease modifying therapies, which are known to alter gut bacteria, therefore providing

a better understanding of the relationship between gut microbiome composition and MS (12).

The International Multiple Sclerosis Microbial Study (iMSMS) based in the United States has recently published the findings of a significant study which looked at 576 pairs of people, with one member of each pair being affected by MS and the other being a non-related housemate. The pairing of participants who lived together was important given that environmental factors such as diet and where one lives can influence our gut microbiome composition. Of the MS participants, 76% had relapsing remitting MS (RRMS), 24% were affected by progressive MS with two-thirds of these taking a disease modifying therapy. Stool samples of all participants were taken throughout the study to analyse each individual's gut bacteria (13).

The study found that there were significant differences in the presence and balance of bacteria in participants who were affected by MS compared to the control group. They identified lower levels of seven species of bacteria and higher levels of sixteen species in those affected by MS. Generally, the bacteria that were found to be lower in the MS group are known to be beneficial to our health, with some playing a part in our body's management of inflammation, such as *Faecalibacterium prausnitzii*.

In people with RRMS, the species *Collinsella aerofaciens* was linked to more severe disease, whereas the group of bacteria *Bacteroides* were linked to less severe disease. Medication was also thought to affect the gut microbiome. Some bacterial species from the group *Akkermansia* were altered compared with the control group in patients not receiving treatment, however, they were found not to be altered in those taking disease modifying therapies.

## How to improve your gut health

What we have learned so far is that there is increasing evidence of the connection between a healthy gut and the onset of autoimmune diseases such as MS. Whilst the world of science is working to find out more about this relationship, it is important to be aware of the ways in which we can ensure our gut composition is as balanced as possible.

### Gut friendly foods

Our diets are the most significant long-term influencer of our gut microbial composition (14). By controlling what we eat with a focus on foods that are known to promote good gut health, we can bolster our immune systems, giving our bodies more ammunition in fighting the onset and impact of inflammatory diseases.

### Probiotics and prebiotics

It is essential to be aware of the role probiotics and prebiotics are thought to play in keeping our guts as healthy as possible. Equally important is awareness of the difference between the two and how they complement each other in the fight to keep a healthy gut microbiome balance.

Fundamentally, probiotics are good bacteria (such as *Lactobacillus acidophilus*) found in certain foods and supplements, whereas prebiotics are types of carbohydrates found in some foods and supplements that act as a food source for our gut's good bacteria. Prebiotics complement the effectiveness of consumed probiotics and as a result, promote the growth of healthy gut bacteria (15).

Sources of probiotics include live or active yoghurt, a variety of specialist probiotic drinks and some fermented foods such as

sourdough bread, kefir and sauerkraut. Examples of prebiotics include onions, garlic, asparagus, jerusalem artichoke and banana.

A meta-analysis published in 2021 looked at four previous clinical trials and six studies that were concerned with the effects that probiotics may have on disease progression in people affected by relapsing remitting MS (RRMS). The results of this analysis were positive and whilst it was concluded that further studies may be required, there was sufficient evidence to suggest that consuming probiotics can have a positive effect on slowing disease progression, low mood and the general health of people affected by RRMS (16).

## **Fermented foods**

It is becoming increasingly evident that fermented foods play a significant role in promoting gut microbiome diversity and in turn have a positive effect on the reduction of gut dysbiosis. These are foods that have undergone a fermentation process, which releases good bacteria from the product whilst suppressing the growth of bad bacteria.

A recent clinical trial undertaken at the Stanford School of Medicine in the United States found that the participants who were assigned a diet consisting of fermented foods had shown decreased inflammatory proteins in post-trial blood samples. This was due to the role that these foods have in remodelling gut microbiota (17).

There are many fermented foods readily available on the shelves of our grocery stores. These include kefir, kombucha, sauerkraut, pickles, yoghurt and apple cider vinegar (18). Also fermenting

foods at home is relatively simple, with the golden rule being to sterilise your food storage jars or bags before use, to prevent the growth of bad bacteria (19). There are many guides to home fermentation widely available on the internet.



**My tip for others would be to take good quality probiotics, a healthy gut is important**



In issue 110 of MS-UK's New Pathways magazine Sharon Peck, who lives with MS and who is a Nutrition Scientist, wrote about nine anti-inflammatory foods that may have a positive influence on the gut microbiome

### **Vegetables**

Particularly rich dark, leafy greens, as they contain polyphenols and antioxidants, which can directly reduce inflammation. Vegetables' high fibre content feeds the microbiome.

### **Fruits**

Some fruits, especially deeply coloured berries, which are potent antioxidants can reduce inflammation. They also provide food for the microbiome, helping to keep your gut healthy. Try and make sure you are getting your five a day, and aim for 10 if you can, after the NHS recently reported that 10 portions of fruit and vegetables is even better for us.

## Oily fish

Mackerel, salmon and sardines are all sources of essential fatty acids (EFAs) omega-3s, which UK researchers found increased anti-inflammatory bacteria in the microbiome and may help directly resolve inflammation.

## Nuts

Nuts are a source of required omega 6 EFA, which can be inflammatory in excess. Walnuts have a balance of omega 6 and omega-3, and research has shown they promote anti-inflammatory microbes.

## Seeds

Seeds are another great source of EFAs. Some seeds, such as flax and chia seeds have a high anti-inflammatory omega-3 content.

## Extra-virgin olive oil

Extra-virgin olive oil is a source of antioxidant vitamin E and anti-inflammatory polyphenols. A review of multiple trials indicated that this oil could improve inflammatory disease symptoms.

## Ginger

Ginger has well-known anti-inflammatory properties.

## Turmeric

Turmeric has been in the news a lot recently and is now well known for its anti-inflammatory properties, but it has poor absorption. Consume it with healthy fats and black pepper to improve absorption. Ready-made turmeric shots have become more commonplace in UK supermarkets in recent times, which provide a convenient and easily digestible method of consumption.

## Legumes and wholegrains

Legumes and wholegrains are other good sources of fibre which could be of benefit to the gut microbiota.



**I read MS-UK's New Pathways magazine which has always included information about diet and MS**



## Stress management

There is evidence that stress can have a negative impact on our gut microbiota balance. A recent review of studies concerned with the role stress plays in human gut dysbiosis found that a range of stressors affect the activity and functions of our gut microbiota. These stressors include sleep deprivation, circadian rhythm disruption, psychological stress, lack of physical activity and noise pollution (20). It follows that by taking steps to manage the impact that stress has upon our bodies, we can help improve our gut health.

MS-UK host a range of online activities which can help with managing stress, these include our mindfulness courses, chair yoga and exercise classes that are designed to cater for a range of abilities. Go to [www.ms-uk.org/ms-uk-online](http://www.ms-uk.org/ms-uk-online) to find out more.

## No smoking

We are all aware of the dangers that smoking poses to our health in general, how it is linked with a range of life-threatening diseases

and how it can have a particularly adverse impact on disability progression in people affected by MS. Additionally, there is growing evidence that the toxins contained in cigarette smoke unsettle the gut microbiota balance, helping to induce dysbiosis (21).

To find out more about Smoking and MS, along with information and links regarding kicking the habit, read our Choices booklet titled 'Smoking and MS'.

## Gut unfriendly foods

There are certain types of food which studies have shown may have a negative influence on our gut health, especially when not eaten in moderation.

A recent study that took place in The Netherlands looked at the dietary habits of just over 1,400 individuals with a view to determining the link between diet, gut microbiota balance and the onset of intestinal inflammation. The study concluded that those whose long-term diets were plant-based, dominated by vegetables, legumes, fruit, nuts, low-fat fermented dairy products and fish presented low levels of bad bacteria and toxins in the gut. This is

**I avoid dairy, meat, processed oils, high saturated fat oils like coconut, palm, cocoa butter, fried food to reduce inflammation and promote unsaturated fats in my cell walls**



in comparison to those whose diets were heavily balanced in the favour of high-fat meats and processed foods (22). Strong alcoholic and soft drinks were also more prevalent in the diets of those with higher levels of gut inflammation.

Similarly, a recent review of published literature focused on the impact of diet on the gut microbiome, concluded that a diet which is high in fat can actively reduce the number of good bacteria, such as *Lactobacillus acidophilus*, in our gut (23).

## Therapeutics

It is felt by some researchers that targeting the gut microbiome with therapeutics could have profound positive effects on disease progression and symptom management in MS. There are various therapeutic options for targeting the gut microbiome including with antibiotics, phage therapy, which uses bacteria-specific viruses that can be used to target certain bacteria, while leaving others untouched, and faecal microbiota transplantation (FMT) which acts as whole gut microbiome replacement in the hope of correcting abnormal gut microbiome structures and functions and dietary supplementation (10).



**I try to avoid refined sugars, grains  
and any highly processed food**



## Specific Diets

**Keeping to any diet may be tough at first. It's worth being in touch with others following the same diet for support and to answer questions**

Several diets have been created with MS in mind. Similar themes run through these diets and most involve reducing saturated fats, restricting or eliminating certain food groups and the use of supplements. Below we take a look at the most prevalent diets that have been formulated to tackle the impact of MS.

### The MIND diet

MIND stands for Mediterranean-DASH Intervention for Neurodegenerative Delay and combines aspects of the Mediterranean diet with the Dietary Approaches to Stop Hypertension (DASH) diet. This diet was devised by Dr Martha Clare Morris SCD and her team at Rush University Medical Centre in the USA to help improve brain function and counter the onset of dementia.

There are no formal guidelines for following the MIND diet, it involves eating 'good' foods such as fish, nuts, leafy vegetables and berries whilst minimising intake of foods considered 'bad', these include red meats, processed meats, sugar, fried foods, butter and

cheese. It is thought that by eating a more natural plant-based diet we can minimise the degenerative effect that inflammation has upon our brains (24).

Recent studies have looked at the impact the MIND diet may have regarding improved brain health in people affected by MS, with positive results. Of particular interest are the results of a study undertaken in the United States which monitored the diets and brains of 185 people who had been given an MS diagnosis within the previous five years. Each participant completed detailed dietary questionnaires and their brains were observed using MRI scans.

It was found that the brains of the participants whose diets were dominated by 'good' MIND diet foods showed a greater thalamic volume when compared to those whose diets were more balanced towards the 'bad' foods (25). The thalamus is a small structure found in the brain which plays a sizable role in our sensory, behavioural, and cognitive functions. Thalamic atrophy has also been found to be significantly prevalent in people affected by MS (26).

### **More information**

A range of books authored by Dr Martha Clare Morris are available for general sale. There are also various websites and books from other sources which offer guidance on following the MIND diet.

### **Fasting mimicking and ketogenic diet**

Researchers at the University of Southern California (USC) have been looking into a 'fasting mimicking diet' to see if it had a positive impact on the prevention and treatment of MS and other autoimmune diseases. The diet involves eating half the usual number of calories for three days in every seven. Calorific intake is reduced during this period, mimicking a 'fast', hence the diet's name.

The most recent USC study looked at the impact of this diet in mice affected by autoimmune encephalomyelitis (EAE), which is a disease similar to MS. The mice were fed according to the diet protocol for three weeks and all showed improvements in their symptoms, compared to a control group that were fed using a regular dietary pattern (27).

The researchers also checked the safety and potential efficacy of the diet over a period of six months using a randomised three-arm pilot trial comprising of 60 participants, all of whom were affected by relapsing remitting MS. Some patients were placed on the fasting mimicking diet for a seven-day cycle and then placed on a Mediterranean diet for six months, whilst others were placed on a ketogenic diet (a high-fat, low carbohydrate diet) for six months. The control group simply retained their normal diets and followed their regular dietary patterns.

The study found that the participants who used a fasting mimicking diet cycle followed by the Mediterranean diet, and those on a ketogenic diet, reported improvements in their quality of life and in their physical and mental health. Those on the fasting mimicking and ketogenic diets showed a 'mild improvement' in disability measured with the Expanded Disability Status Scale (EDSS).



**The Mediterranean diet is dead easy to follow  
and it's good as it's only eating fresh food**



It was acknowledged by the researchers that the study had limitations, as it did not test whether the Mediterranean diet alone would cause improvements, nor did the study involve participants undergoing MRI tests to assess disease activity. Further and more extensive trials will be needed to better understand the effects and potential benefits of the diet (27).

Valter Longo, the lead researcher looking into the benefits of the fasting mimicking diet, and director of the Longevity Institute at the University of Southern California, has written a book called 'The Longevity Diet'. The book contains recipe ideas and explains the full science behind the diet.


All the profits from sale of the book are being donated by the author to the non-profit organisations Valter Longo Foundation' and 'Create Cures' with the aim of promoting and sponsoring research on low cost, alternative, and integrated therapies for diseases and long terms conditions such as Alzheimer's disease, cardiovascular diseases, diabetes and MS (28).

### **More information**


[www.valterlongo.com/the-longevity-diet](http://www.valterlongo.com/the-longevity-diet)

## **The Swank diet**

One of the most well-known diets relating to MS is the Swank diet. Dr Roy Laver Swank MD PhD, was the first head of neurology at what is now Oregon Health & Science University and began his research into diet and MS in the 1940s. His observations of the prevalence of MS in certain geographic areas led him to believe there was a correlation between MS and diet. Dr Swank believed a low-fat diet would help to alleviate some MS symptoms (29).



**I am on the Swank diet, but also gluten-free. It was hard to start with but fine now and I have been following it for years**



Fundamentally the Swank diet focuses on reducing the consumption of saturated and unsaturated fats which can be found in meat (particularly red meat) and processed foods, dairy and products containing dairy. Alternatively, monounsaturated fats (sources include olive oil and nuts), lean meat, fish, fruit, vegetables and whole grains provide the foundations of this diet. The use of specific supplements such as cod liver oil, vitamin C and multi-vitamins are also recommended (30).

Follow-up research based on the late Dr Swank's work has been carried out by former colleague Dr John McDougall. This study was a year in duration with a total of 61 participants (29 in the control group, the remainder in the diet group) and concluded that although there were no noteworthy positive outcomes in relation to brain MRI results, relapse rate or disability in participants who were affected by RRMS, there were some encouraging findings. These being that the participants who were part of the diet group showed significant improvements in levels of fatigue, body mass index (BMI) and metabolic biomarkers. The study concluded that further research is needed to foster a better understanding of the long-term impact of this diet (31).

### **More information**

[www.swankmsdiet.org/the-diet](http://www.swankmsdiet.org/the-diet)

**I followed Swank initially (from 1981), OMS (Professor Jelinek) since 2009. So low saturated fat initially and now plant-based with seafood. Plus high doses of vitamin D and flaxseed oil. I'm healthier in so many ways as a result and do feel better for a clean diet**


## **The Overcoming Multiple Sclerosis (OMS) diet**

Professor George Jelinek, an Australian medical professional, developed the OMS diet in 1999, inspired by his own MS diagnosis and that of his mother. The OMS diet focuses on a largely plant-based, very low-saturated fat diet, with omega-3 supplements in the form of cold-pressed flaxseed oil. Since its existence, the OMS diet and overall program continue to evolve as more evidence is gathered (32).

**The whole lifestyle of OMS helps me feel positive and confident I am doing the best, evidence-based things to slow down the progression of my MS and prevent other disorders**



**I made changes after consulting a nutritionist when I was diagnosed in 1999 and I am now following the OMS programme**



In 2011 Professor Jelinek, along with colleagues at the University of Melbourne's Neuroepidemiology Unit (NEU), commenced work on the Health Outcomes and Lifestyle in a Sample of people with Multiple Sclerosis (HOLISM) observational study. This study comprised over 2,500 participants at baseline with the objective of finding out more about the impact of lifestyle on the progression of MS, with a special focus on the possible benefits of diet, exercise, vitamin D, omega 3 supplementation and stress relief (33).

To date, the HOLISM study has found evidence that following the OMS diet and overall lifestyle regime is associated with a better quality of life in people affected by MS. Regarding diet, the participants who consumed the lowest amounts of meat, dairy, alcohol and higher levels of omega 3-derived flaxseed and fish reported better physical quality of life scores and lower relapse rates (33).


The OMS diet forms part of the Overcoming Multiple Sclerosis program, an 'evidence-based whole lifestyle programme approach' that also includes vitamin D supplementation, exercise and meditation. People who follow the OMS lifestyle and diet can also




get support from the OMS charity in the form of their forum, exercise videos and regular podcasts. Additionally, those who are newly diagnosed with MS in the UK, Ireland, Australia and New Zealand can request a free copy of the OMS book.

### **More information**

[www.overcomingms.org](http://www.overcomingms.org)



**I'm following Overcoming MS which has a strict diet. It seems to be doing me good! Basically vegan plus fish and nothing fried, the only oil is extra virgin olive oil and flaxseed oil. The latter to be taken daily as a very rich source of omega 3**



### **The Wahls Protocol**

Dr Terry Wahls is a clinical professor of medicine at the University of Iowa. In 2000 Terry was diagnosed with relapsing remitting MS (RRMS). A diagnosis of secondary progressive MS (SPMS) followed in 2003. As her condition progressed, Dr Wahls started to use a tilt-recline wheelchair, a situation that continued for four years.

Shortly after Dr Wahls underwent chemotherapy in an attempt to arrest the progression of her condition, she began studying biochemistry, immunology and cell biology. She went on to design a

regime of supplements to ‘feed the brain’.

**I found that reading the book ‘The Wahls Protocol’ really helped focus me**


In 2007 Dr Wahls worked with Functional Medicine, an organisation focused on working with doctors to improve the health of people with chronic illnesses. As a result, Dr Wahls designed a diet called the Wahls Protocol.

This diet is based on key elements of the paleolithic (or paleo) diet. A paleolithic diet is based on foods similar to those that would have been eaten during the paleolithic era and typically includes lean meats, fish, fruits, vegetables, nuts and seeds — foods that could be obtained by hunting and gathering. Dr Wahls attributes this


**I recommend giving the paleo diet a try. I like the Wahls protocol but with some leeway. I can’t eat that much meat every day and don’t like fish but still found an improvement**

protocol to an improvement in her health and motor function, and can now walk without mobility aids and cycle to work (34).

The Wahls protocol eliminates sugar, processed foods, grains (wheat, oats, rice), soy, dairy, eggs, potatoes, tomatoes and legumes (beans and lentils) and increases the intake of grass-fed meat, fish, fruit, vegetables (especially green leafy vegetables) and plenty of fat from animal and plant sources, (especially omega 3 fatty acids). It is a flexible diet in that those following the protocol can choose from one of three levels to start with (with level one being the least restrictive) in terms of both foods to eat and foods to avoid. The aim is to build up to level three in both areas to benefit fully from the diet (35).




**Over 30 years ago when I was diagnosed, I read Judy Graham's book and made sure I changed my diet and took supplements. After attending a seminar with Dr Terry Wahls I changed to grass-fed meat, wheat, gluten and dairy free**




Dr Wahls uses this protocol in her primary care and traumatic brain injury clinics. In collaboration with colleagues at the University of Iowa, Dr Wahls ran a small trial for people with SPMS which included a modified paleolithic diet with supplements, stretching, exercises and electrical stimulation (of trunk and lower limb muscles), meditation

and massage. The study had a very small number of participants and not all of those that signed up for it completed the trial. However, those that saw the trial through to completion showed a significant improvement in their levels of fatigue. Whilst these positive outcomes were encouraging the study concluded that given the small sample size, further studies were warranted (36).



**I avoid dairy and the majority of gluten. I also follow Wahls protocol (I do a modified version of the diet by having a plateful of fruit or vegetables for breakfast and lunch). Regarding supplements, I take vitamin D3, a multivitamin and fish oil daily. I feel better for it**



Research into the benefits of the Wahls Protocol is still ongoing, headed by Dr Wahls and colleagues. The most recent study was first published in July 2021 which looked at the impact both the Swank diet and Wahls Protocol may have in the management of RRMS, with separate groups of participants following each diet over set periods. This clinical trial concluded that over both 12 and 24-week periods, participants of both groups showed an improvement in levels of fatigue and quality of life (37).

### **More information**

[www.terrywahls.com](http://www.terrywahls.com)

**I eliminated all dairy from my diet as a result of reading the Wahls Protocol and OMS books. It's the one dietary change they both agree on so seems like a good bet**

### **The Best Bet diet**

Ashton Embry PhD developed his Best Bet diet and the charity DIRECT-MS (Diet Research into the Cause and Treatment of Multiple Sclerosis) in the late nineteen nineties after his son was diagnosed with MS. His diet is based on the theory that an autoimmune process is ignited by undigested food proteins escaping through the gut wall into the circulatory system. The immune system sees these proteins as invaders and starts to attack. He refers to this as 'leaky gut syndrome' (38).

**I have tried the Best Bet diet, it was hard for me to stick to, but I felt healthier as a result of a 'clean' diet**

The Best Bet diet focuses on four main areas; foods to avoid, foods to eat in moderation, foods to increase and the use of supplements. The diet's ethos is that stopping or restricting the consumption of

foods which have a molecular structure similar to myelin reduces the body's autoimmune response (39).

## **Foods to avoid**

### **Dairy**

Including all animal milk and butter, cheeses and yoghurts made from animal milk and all products that contain them. A suitable alternative is rice milk or low-fat coconut milk.

### **Gluten**

Found in wheat, rye, oats and barley, and all products containing them. These can be replaced by rice, corn, quinoa and gluten-free flours and grains.

### **Legumes**

Beans, peas and pulses, especially soya, and all products containing them.

### **Refined sugar**

Although not a protein, refined sugar is believed to make the leaking of food proteins worse. Consumables such as sweets, soft drinks and other foods with a high sugar content should be avoided.

## **Foods to eat in moderation**

### **Saturated fats**

Reduce intake of foods that contain saturated fat. These foods are red meats (due to saturated fat levels), omega-6 polyunsaturated fats (found in margarine and cooking oils).

Replace with monounsaturated fat such as olive oil.

### Non-gluten grains

Lower the consumption of these types of grain, which include corn and oats. Substitute with rice where possible.

### Alcohol

Reduce consumption of alcohol, try to eliminate beer, and drink wine in moderation.

## Foods to increase intake

### Lean meats

Increase the consumption of meats such as skinless chicken breast, game and fish, of which the latter particularly provides a good source of protein and omega 3 polyunsaturated fat.

### Fruit and Veg

Make sure your diet consists of large amounts of fruit and vegetables.

### Supplements

Supplements are an important part of the Best Bet diet. The diet suggests that a wide range of vitamins, minerals and antioxidants are taken daily including high dose vitamin D (40).

It is also suggested that a person wishing to follow the Best Bet diet has a food intolerance blood test to identify the foods they may be sensitive to (39).

### More information

[www.direct-ms.org](http://www.direct-ms.org) | [www.mshope.com](http://www.mshope.com)

**I follow the Best Bet diet and it has become second nature**

**Our body needs the correct fuel via food and supplements to help our brain's mitochondria perform as well as they can. Reading Dr Wahls, George Jelinek, Dr Mercola and Patrick Holford's work has meant significant and positive changes to my diet and lifestyle**

## **Dietary supplements**

There are many dietary supplements available to support a variety of health needs and in recent years the health food marketplace has been flooded with a variety of supplements and vitamins. Below we list some of the main dietary supplements and vitamins that people with MS may choose to take.

### **Vitamin D**

Vitamin D is needed by our bodies to ensure efficient absorption



of nutrients which help keep bones, muscles and teeth healthy. It is thought that vitamin D plays a role in people with MS, although exactly what that role is and how it can help is still being investigated by researchers and clinicians.

Vitamin D is the only vitamin that our bodies can manufacture naturally, which is done by exposure to sunlight. It can also be found in some foods, such as eggs, oily fish, milk and vegetable fat spreads. Additionally, foods such as cereals are fortified with vitamin D. In the UK, our bodies may benefit from Vitamin D supplementation during autumn and winter as the sun is not strong enough to deliver the amounts we require.



**I do feel the difference from taking supplements. With vitamin D there was almost an instant change. It even helped me sleep better**



MS-UK has a dedicated Choices booklet that explains more about the role vitamin D plays in helping us to stay healthy, its links with MS, related research and dosage. You can download a copy from our website or order a physical copy by contacting us.

## **Lipoic acid**

There is growing evidence that lipoic acid supplementation may help with the management of MS. In recent times there have been a number of studies and clinical trials undertaken to investigate

the impact that this supplement, which is fundamentally an antioxidant that can be found in our bodies naturally, may have if used therapeutically. The theory is that this powerful antioxidant can help prevent or at least reduce the damage that oxidative stress can cause to the nervous system of people diagnosed with MS. Oxidative stress occurs once the central nervous system has been damaged and leads to further demyelination, the onset of relapses and disease progression (41).

In late 2021 a systematic review of 32 studies, each looking at the benefits of lipoic acid supplementation as a therapeutic treatment for people affected by MS, found that it prevented the worsening of EDSS scores in human participants and actively decreased the disability scores in mice. The review concluded that whilst the results were encouraging, further studies and trials were required to provide additional evidence of lipoic acid benefits (41).

A comparative study taking place across North America comprising 115 participants affected by progressive MS, titled 'lipoic acid for Progressive Multiple Sclerosis' (LAPMS), is currently ongoing with an estimated completion date of June 2024. The study involves half of the participants taking 1200mg of lipoic acid daily for two years, with the other half assigned to a placebo. The aim is to ascertain the effectiveness of lipoic acid supplementation in reducing brain injury and maintaining mobility (42).

Foods that are generally known to be a good source of lipoic acid include spinach, broccoli, potatoes, tomatoes, sprouts and carrots.

## **Vitamin B12**

The human body needs vitamin B12, also known as cobalamin, hydroxocobalamin or Cobalin-H, to make red blood cells, keep the

nervous system healthy and help our bodies release the energy provided by our foods. More specifically related to MS, vitamin B12 helps to promote a healthy myelin sheath, nervous system and bone marrow.

MS and B12 are often linked because vitamin B12 deficiency can present similar symptoms to MS, such as extreme tiredness and lack of energy, pins and needles, muscle weakness and disturbed vision. If a doctor suspects a person may have MS they will conduct initial blood tests to check for vitamin B12 deficiency to rule this out first.

NHS guidelines recommend that adults aged between 19-64 years need about 1.5mcg a day of vitamin B12. It can be found naturally in food such as meat, fish, milk, cheese and eggs. For most of us, having a diet that consists of these types of foods should be enough to ensure that our bodies get sufficient levels of B12. Those following a vegan dietary regime may need to consider taking B12 supplements. According to NHS guidelines, taking 2mg or less a day of vitamin B12 in supplements is unlikely to cause any harm (43). If you are concerned, consult with your doctor as to your optimum dosage.

Historically, scientific studies designed to learn more about the connection between B12 and MS have provided mixed results. The quest to learn more continues however and a recent comparative study found that a small sample of participants who were affected by RRMS and received B12 and folic acid supplementation, reported reasonable improvements in quality of life, both physically and mentally. This was in comparison to a placebo-led group of the same sample size. The study concluded that whilst these results are encouraging in terms of the potential role that B12 supplementation could play in the treatment of MS, more studies

will need to be conducted to facilitate further understanding (44).

**I took ginkgo/ginseng and B12 initially and I soon found it helped brain fog and energy levels. I now take CBD oil too**

### **Omega 3**

Omega 3 is a family of essential fatty acids that are important for health, also known as polyunsaturated fats. Being an essential fat, omega 3 is not produced naturally by the human body and needs to be consumed. Foods that are high in omega-3 fatty acid content include fish, flaxseeds and flaxseed oil (also known as linseed oil), chia seeds and walnuts. Omega 3 can also be consumed as a supplement in a variety of formats.

Three main types of essential fatty acids can be obtained from omega-3

- Alpha-linolenic acid (ALA) is found mostly in plant-based sources such as flaxseed, chia seeds and flaxseed based versions of omega 3 supplements. ALA can be a precursor of the longer-chain fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) and studies have found it to have neuro-protective, antioxidative and anti-inflammatory effects on our bodies (45).
- EPA and DHA are long-chain fats that can be found mainly in

animal derivatives such as fatty fish and fish oil, plus omega 3 supplements that are of animal origin. It has also been found that ALA can be converted naturally by the body to produce EPA and DHA, however only in small amounts. Both EPA and DHA have been found to play an important part in supporting our body's anti-inflammatory responses, with evidence showing that DHA plays a particularly important role in this process (46).

Whilst omega 3 is known to be beneficial to our general health, particularly in terms of our cardiovascular wellbeing, studies have also shown that it can have a positive impact in managing the impact of MS. A recent meta-analysis of over 5,000 studies, focused on the role which omega 3 fatty acids play in managing our body's anti-inflammatory responses, specifically regarding MS, found sufficient evidence to conclude that omega 3 has beneficial effects in reducing anti-inflammatory markers, relapse rate and improving the quality of life for MS patients (47).

In their guidelines for the management of MS, the National Institute for Health and Care Excellence (NICE) has issued a 'do not do' recommendation, saying 'do not offer omega 3 or omega 6 fatty acid compounds to treat MS'. NICE believes that there is no evidence that they affect relapse frequency or progression of MS (48). However, if further studies continue to show a positive relationship between omega 3 supplementation and the treatment of MS, this stance may change.

In the UK there is no specific recommended dosage for omega 3. According to the British Dietetic Association (BDA) everyone should try to eat two portions of fish per week, one of which should be oily fish, to promote good general health and provide our bodies with a good source of vitamins and minerals.

People who do not eat fish can get omega 3 from the following foods, nuts and seeds e.g. walnuts and pumpkin seeds; vegetable oils e.g. rapeseed and linseed; soya and soya products e.g. beans, milk, tofu and green leafy vegetables. Some foods have omega 3 added to them and so can be useful sources, especially for vegetarians and others who avoid fish. These include eggs and yoghurt, bread and spreads and will help to increase your omega 3 intake. The BDA also suggest people should exercise caution when considering obtaining omega 3 through specific supplements (49).



**I take flaxseed oil for omega 3 and vitamin b12 as I'm not eating meat or dairy**




## Evening primrose oil


Evening primrose oil (EPO) contains high levels of the omega 6 essential fatty acid gamma-linolenic acid. EPO is a common supplement and has had associations with improving some MS symptoms.

A recent small study explored the effect of EPO on fatigue and quality of life in patients with MS and had some positive findings. In this double-blind randomised trial, 52 people with MS were chosen and categorised into two groups which received either EPO or placebo. The 'quality of life and fatigue scale' was used in the trial and participants were investigated before the treatment and again three months after therapy. The findings were then compared between the two groups. The research found that EPO consumption had no

impact on the quality of life in general, however, it had a significant effect on several important aspects of life quality such as the increase of cognitive function, vitality, and overall life satisfaction. EPO also reduced pain and fatigue in comparison to the placebo consumption, but it did not prevent progression of MS (50).



**I have taken oil of evening primrose  
and followed a low-fat diet since week  
one of my diagnosis 31 years ago**



### **Nicotinamide adenine dinucleotide (NAD+)**

Nicotinamide adenine dinucleotide (NAD+) is a coenzyme found in all living cells. It exists in two forms, an oxidized and a reduced form (abbreviated as NAD<sup>+</sup> and NADH respectively). These are the active coenzyme form of vitamin B3 (Niacin). There has been research into NAD<sup>+</sup> and MS. According to Judy Graham's book *Managing Multiple Sclerosis Naturally*, NAD<sup>+</sup> boosts energy and the immune system (51).

In a 2014 study it was reported that NAD<sup>+</sup> has potential to be a future therapeutic drug to treat MS. This early-stage study will help researchers look into NAD<sup>+</sup> as a potential treatment for many autoimmune diseases including MS, but more research would need to be conducted (52).

More recently a study published in 2021 which looked at the impact that NAD<sup>+</sup> had on the nervous system function of mice who were

modelling MS, concluded that NAD<sup>+</sup> treatment led to a reduction in damage to the brain and delayed the onset of neurological symptoms (53). Whilst the evidence so far is promising, further studies are required to determine the efficacy of NAD<sup>+</sup> in the treatment of MS in humans.

The dietary supplement nicotinamide riboside (B3) and NAD<sup>+</sup> are readily available from many health food shops and many stockists via the internet. In a blog post titled 'The top 15 supplements for natural MS treatment', Dr Ronald Hoffman, a complementary medicine practitioner from New York, recommends that 300mg of NAD<sup>+</sup> is taken twice a day (54).

## Coenzyme Q10

Coenzyme Q10 (CoQ10) is an antioxidant that is produced by our bodies but diminishes as we age. It is involved in producing adenosine triphosphate (ATP), which is the cell's main energy source and produces protein. CoQ10 is fat soluble, so it is suggested that any supplementation should be taken with a meal that contains some fats.

A double-blind placebo-controlled trial in 2016 explored the effect of high-dose CoQ10 (500mg per day) on fatigue and depression in people with MS. This was a small trial with a total of 48 participants, mostly women, and the researchers used the 'Beck Depression Inventory' and the 'Fatigue Severity Scale' to measure outcomes. After 12 weeks, significant improvements were seen and the study suggests that CoQ10 supplementation (500 mg/day) can improve fatigue and depression for people affected by MS (55).

Research is at an early stage regarding CoQ10 as a means



of tackling demyelination in MS. A study, published in 2021, treated a group of MS-induced mice (via CPZ intoxication) with a course of CoQ10 of 150mg per day, whilst comparative groups did not receive this treatment. The study found that mice treated with CoQ10 presented a reduction in oxidative stress and inflammation, which is the process that is associated with demyelination. The conclusion was that CoQ10 showed the ability to enhance remyelination in mice and that this may also apply to MS patients. However, more studies will be required to evidence this (56).

## **We asked the MS community to share their 10 top tips for managing dietary changes, they are...**

**1**

**You can exchange white sugar for molasses, maple syrup, coconut sugar or honey if you have to have something sweet. To lessen the sweet addiction, I use drops of apple cider vinegar on anything. It takes a while to work, but it does**

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**2**

**My tip is to purchase a slow cooker. I use a slow cooker for one pot cooking, great when you are tired at the end of the day and a delicious meal just needs serving up. It makes life so much easier**

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**3**

**If you fancy cakes and biscuits - make them yourself instead of buying. That way you know what's in them. (And because it means more effort you do it less often!)**

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**4**

**My tip is to plan in advance what you are going to eat, this helps with time management and decision making and helps with fatigue in the kitchen**

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**5**

**When I am well enough to cook, I make more than I need so I can freeze portions to avoid cooking on bad/busy days**

6

My tip is to have it clear in your mind that you are making a lifestyle change to support your MS. This will likely include dietary changes, supplements, yoga, Pilates, walking or exercise, meditation and mindfulness. It's a lifestyle change that helps us manage symptoms better and improves our health and hence MS

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7

I try to plan my meals for the week ahead. I search online for recipes. There's so much good information out there

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8

Scour the internet for yummy recipes (for example, The Food Allergy Hub). Interestingly, sites for children/babies are a great source of recipes for dairy/gluten-free meals, you can use them and adapt them for the adult pallet (more salt/pepper, spices etc)

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9

I suggest mainly eating whole foods and having a high vegetable intake, and my tip is to take plenty of B vitamins and essential fatty acids (e.g safflower oil or flaxseed oil)

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10

Allow yourself a treat occasionally. Having MS is enough without depriving yourself of the occasional chocolate or whatever takes your fancy

# About MS-UK

MS-UK is a national charity formed in 1993 supporting anyone affected by multiple sclerosis. Our hope for the future is a world where people affected by MS live healthier and happier lives.

MS-UK has always been at the forefront of promoting choice, of providing people with all the information and support they need to live life as they wish to with multiple sclerosis, whether that be through drugs, complementary therapies, lifestyle changes, a mixture of these or none at all.

We will always respect people's rights to make informed decisions for themselves.

## The MS-UK Helpline

We believe that nobody should face multiple sclerosis alone and our helpline staff are here to support you every step of the way.

Our service is informed by the lived experience of real people living with MS, so we can discuss any treatments and lifestyle choices that are of benefit, whether they are clinically evidenced or not.



## New Pathways

Our bi-monthly magazine, New Pathways, is full of the latest MS news regarding trials, drug development and research as well as competitions, special offers and product reviews. The magazine connects you to thousands of other people living with MS across the country.

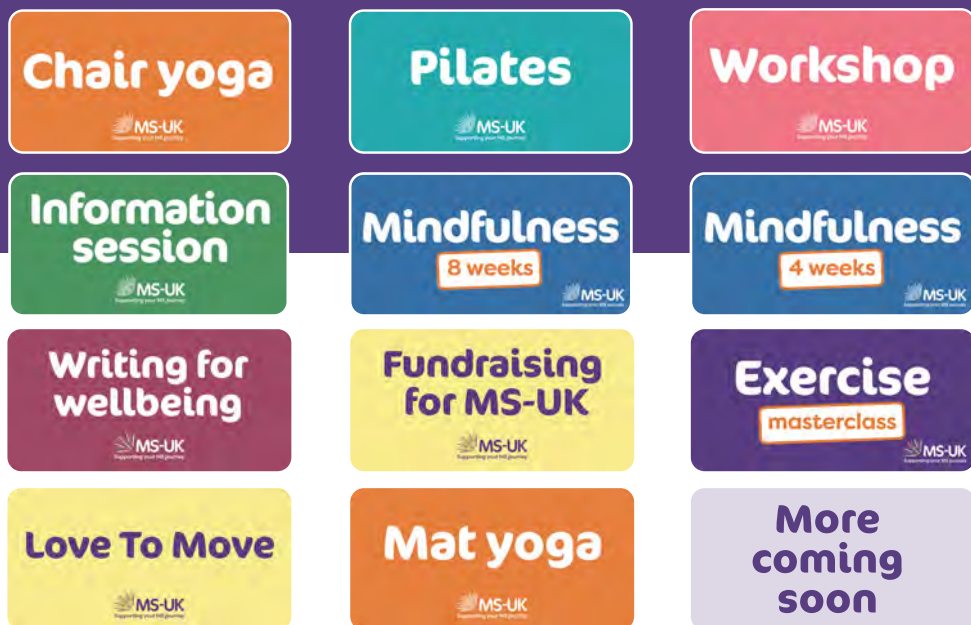
Available in print, audio version, large print and digitally.

# About MS-UK

## Peer Support Service

Our Peer Support Service enables people to connect with others in a safe space and share experiences on topics of interest. Our Peer Pods take place regularly and are all volunteer led. Please visit the website to find out more [www.ms-uk.org/peer-support-service](http://www.ms-uk.org/peer-support-service) or email [peersupport@ms-uk.org](mailto:peersupport@ms-uk.org).





## Online activities

MS-UK offers a variety of online activities to stay active and connected for those affected by MS and manage their symptoms to live happier and healthier lives. Activities include exercise sessions, mindfulness courses, chair yoga classes, information sessions and workshops. Visit our website to explore and find out more.

## E-learning

Do you work with or support someone living with MS and want to increase your understanding and knowledge of this long-term health condition? Professionals at MS-UK have created accredited Learning courses that can help you do this. Visit <https://ms-uk.org/excellence-ms/> to find out more.

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