

MS Perspectives™

Volume 11, Issue 1

Practical Insights on
Multiple Sclerosis

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“It is only with the heart
that one can see rightly;
what is essential is
invisible to the eye.”

—ANTOINE DE SAINT-EXUPÉRY,
THE LITTLE PRINCE

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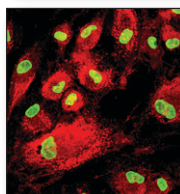
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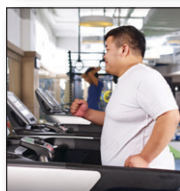
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UPDATE

DISEASE-MODIFYING THERAPY

Disease-modifying therapies (DMTs) for multiple sclerosis (MS) have changed the course of the disease, and each year there are more drugs in the pipeline. One of the most promising, which is expected to gain the approval of the Food and Drug Administration (FDA) in 2019, is cladribine. This oral drug has been approved for use in Europe, where it is called Mavenclad, to treat relapsing forms of MS. It is prescribed for 2 years: During the first and second year, cladribine is given for 4 or 5 days as a daily medication, with the dose determined by the person's weight. The drug is believed to target immune cells associated with MS, and appears to prompt the immune system to reset itself toward a more normal balance.

Several randomized, double-blinded, controlled studies have been performed, showing cladribine is effective in reducing relapse rates, magnetic resonance imaging (MRI) activity, and the progression of disability. In one trial, called CLARITY, cladribine was found to reduce the annual relapse rate by 67%. It also reduced disability progression—by 82%—compared to a placebo over 6 months.

Infections such as urinary tract infections and colds are common side effects of cladribine. No cases of serious infections such as progressive multifocal leukoencephalopathy (PML) have been seen with the drug, however, as they have with some other DMTs. There was also an initial worry that the drug might cause cancer, but recent analyses

have found no increase in cancer rates in people taking cladribine versus a placebo.

Gilenya® for Kids

Another big development is the recent FDA approval of fingolimod (Gilenya®) for children and adolescents with relapsing MS, the first DMT to be approved for kids and teens. It's estimated that close to 5% of MS cases begin in childhood.

The drug, which was approved by the FDA for adults in 2010, is taken as a pill once a day, with or without food. The dosage for children is lower than the dosage for adults and is based on body weight. In the PARADIGMS trial of 215 children ages 10 to 18 from all over the world, Gilenya® was compared to interferon beta-1a weekly (Avonex®) and found to reduce the annual relapse rate by 86%, and was also effective in slowing MRI activity and loss of brain volume. This is encouraging, since children tend to have a lot of relapses.

Common side effects in this trial—which were similar to those seen in adults—included headache, elevations of liver enzymes on laboratory tests, diarrhea, cough, flu, sinus infection, back and stomach pain, and pain in the arms and legs. Gilenya® is also associated with a potential for PML.

A New Drug for Secondary-Progressive MS

The drug siponimod, a so-called S1P modulator like fingolimod (Gilenya®), has been shown in a double-blind, randomized trial to be effective in slowing the progression of disability in people with secondary-progressive MS (SPMS). The results of the phase-3 EXPAND trial (the last clinical trial phase necessary for application to the FDA for drug approval), published in the journal *The Lancet*, included 1,651 people from 31 countries. The subjects were randomized to receive either siponimod or a placebo orally once a day. At 6 months,



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siponimod decreased disability scores by 26% compared to the placebo. It also slowed brain shrinkage by 23% and reduced the annual relapse rate by 55% after 2 years. This is encouraging news since there are few options for the treatment of SPMS, and most of the patients in the study had advanced disability.

Siponimod appears to work by reducing the number of lymphocytes (immune cells) circulating in your blood, which in turn reduces the inflammation related to MS. Serious side effects such as infections, cancer, and deaths were comparable between the active drug and the placebo. People in the siponimod group did, however, have low immune cell counts and increased liver enzyme levels. They were also more likely to have slow or irregular

heart rhythms, high blood pressure, a reactivation of the varicella zoster virus (the chicken pox virus, which can lead to shingles), and convulsions more frequently than subjects on the placebo.

A new drug application for siponimod has been accepted by the FDA, which is expected to approve it in early 2019.

Drug Withdrawal from Market

The drug daclizumab (Zinbryta®) was withdrawn from the US market in the spring of 2018 due to serious safety concerns. This drug is a monoclonal antibody and caused complicated and worrisome side effects, according to the manufacturers.

Support Programs for MS Disease-Modifying Therapies (DMTs)

Aubagio®, Genzyme Corporation:

www.aubagio.com, 855-MSONE2ONE (855-676-6326)

Avonex®, Biogen:

www.avonex.com/en_us/home/above-ms-program/join-biogen-support.html, 800-456-2255

Betaseron®, Bayer HealthCare:

<https://www.betaseron.com/why-betaseron>, 844-788-1470

Copaxone®, Teva Neuroscience:

<http://copaxone.com/AboutSharedSolutions.aspx>, 800-887-8100

Extavia®, Novartis:

www.extavia.com/info/PatientSupport/Patient-support-program.jsp, 866-398-2842

Gilenya®, Novartis:

www.gilenya.com/c/go-program, 800-GILENYA (800-445-3692)

Glatiramer Acetate Injection, Mylan

<https://www.glatirameracetate.com/en/patient-support> 844-695-2667

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www.glatopa.com/glatopa_care, 855-GLATOPA (855-452-8672)

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www.mslifelines.com, 877-447-3243

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www.tecfidera.com, 800-456-2255

Tysabri®, Biogen:

www.tysabri.com/en_us/home/join-biogen-support/join-biogen-support.html, 800-456-2255

MS News, Support, and Self-Help Groups

Can Do Multiple Sclerosis

www.msando.org

MS Views & News

<http://www.msviews.org/msviewsandnews4>

MS World

www.msworld.org

Multiple Sclerosis Association of America

<http://mymsaa.org>, 800-532-7667

Multiple Sclerosis International Federation

www.msif.org

Multiple Sclerosis Foundation

www.msfocus.org, 888-MSFOCUS (888-673-6287)

National Multiple Sclerosis Society

www.nationalmssociety.org, 800-344-4867

A REALITY CHECK: STEM CELL THERAPY FOR MS

When you have a chronic disease like multiple sclerosis (MS) that can be disabling, it's tempting to hope that there will be a miracle treatment. After all, disease-modifying therapies (DMTs) have absolutely changed the course of the disease and delayed the progression of disability. Stem cell therapy is the next big horizon, and stem cell treatments are readily available all over the world. But caution is advised.

"There are a lot of places cropping up that are offering stem cell therapy, feeding off of a vulnerable population that is desperate for anything, and ruining the reputation of stem cell therapy for legitimate researchers," said Mark Freedman, MSc, MD, FRCPC, of the University of Ottawa in Canada, during a press conference at the 2018 Consortium of MS Centers meeting.

Dr. Freedman has studied stem cell therapy for MS with

success, but he advised

against patients going

to free-standing stem cell centers

that claim they can remove fat

cells from the abdomen in the morning,

cull the stem cells from the fat, and

infuse the stem cells into the body in the

afternoon. There are far too few stem

cells in these samples (billions are needed) and

the procedure cannot be

accomplished in a day. In addition, the

procedures are costly (\$5000 to \$20,000) and there are dangers to the technique—for instance, reinfused stem

cells may not behave properly, and can potentially cause blindness, cancer, or infections.

What Are Stem Cells?

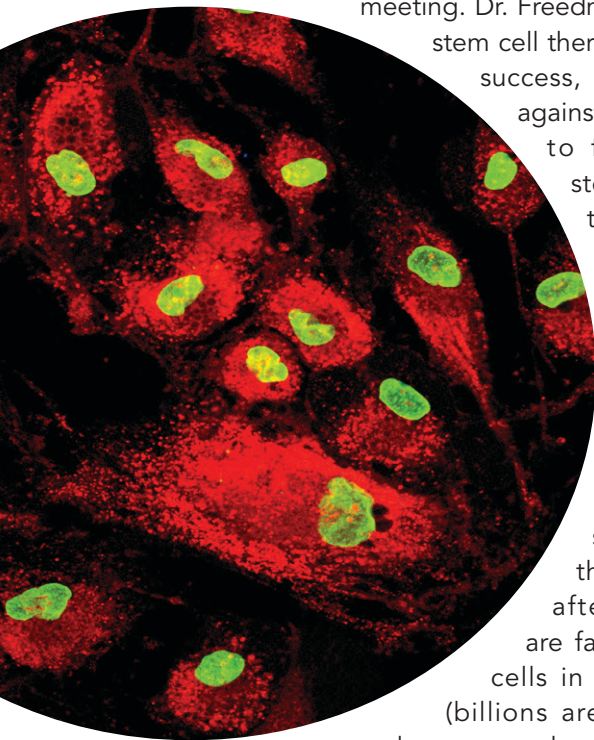
Stem cells are cells that can grow into almost any kind of cell in the body, including immune cells. This makes them extremely attractive for managing, and perhaps even curing, disease. In fact, they may be capable of controlling the inflammation related to MS, and repairing damage to the body.

Two Stem Cell Strategies

There are two types of stem cells that are being researched in MS: Hematopoietic stem cells and mesenchymal stem cells. Hematopoietic stem cell transplantation (HSCT), which was first attempted in 2001, requires a bone marrow transplant and is a disease-modifying therapy and not a repair therapy, explains Fred D. Lublin, MD, Saunders Family Professor of Neurology, Director of The Corinne Goldsmith Dickinson Center for Multiple Sclerosis at the Icahn School of Medicine at Mount Sinai in New York City. For this procedure, stem cells are harvested from the bone marrow and a person's immune system is destroyed with chemotherapy drugs. The treated stem cells are then infused into the body to create a new, calmer immune system. The process has been described as being similar to rebooting a computer: The new immune system maintains the ability to react to threats to the body, but no longer overreacts as it does when it is under the control of MS.

Several studies have found that HSCT can lead to sustained remission from MS and stabilization of brain/central nervous system function. In a 2016 publication by Dr. Freedman's group, for instance, of approximately 32 patients with advanced MS treated with HSCT, over a 13-year period a third normalized, a third experienced no change, a third had progression of their MS, and one patient died. The patients who improved did not require any additional treatment.

In the HALT-MS trial conducted in the United States, HSCT reduced progression of disability by 91% and relapses by 87% over a 5-year period, again without the need for additional therapy such as an injectable, oral, or infusible DMT. Side effects included infections and blood



abnormalities. However, there were no significant long-term neurological side effects.

While stem cell therapies show tremendous promise to halt and even cure MS, the field is still in the early stages.

Despite the positive results, research is still preliminary and “the question remains: Who is an appropriate candidate for this therapy?” asks Dr. Lublin. “HSCT is a very aggressive therapy that is not to be undertaken lightly given that the immune system is completely suppressed. HSCT works best in people with early disease who don’t have a lot of disability and neurological damage, but they need it the least, and we have many other therapies today that are safer and work well, without a risk of death.” In addition, HSCT is likely to destroy a woman’s ability to become pregnant naturally, so women who wish to have children may want to consider storing their eggs prior to undergoing the procedure.

In contrast to HSCT, mesenchymal stem cell transplantation (MSCT) is designed to repair the damage caused by MS, and does not require that the immune system be destroyed. MSCT is not as far along in development as HSCT and has mainly been studied in mice, and there are many technical and safety issues that remain to be explored and understood. “We are looking for well-designed studies to tell us more,” says Dr. Lublin, “and MSCT is being studied in people in a limited number of places worldwide.”

***Its Time Is Coming,
But It’s Not Here Yet***

While stem cell therapies show tremendous promise to halt and even cure MS, the field is still in the early stages. If you are interested in learning more about entering a trial for stem cell therapy, talk with your MS provider for referral to trials. It is critical that you be fully warned about the risks and benefits, and understand the procedures well. As a final warning, Dr. Lublin cautions that “You should only receive stem cell therapy within clinical trials in the United States, and from clinicians who are well experienced in the procedure.”



Diet Research: FOR MS AND Weight Loss

You are what you eat. We all know that. But you're also when, how, and where you eat, according to the latest nutrition research. This research also suggests that diet isn't a miracle cure for multiple sclerosis (MS). "People hear these miraculous stories about patients recovering the ability to walk after they started on this diet or that, and everyone wants to believe it," Lauren Piccio, MD, an associate professor of neurology at Washington University School of Medicine in St. Louis, MO, was quoted as saying about MS diet research. "All we have right now are anecdotes. The fact is that diet may indeed help with MS symptoms, but the studies haven't been done."

Gut-Friendly Eating

A major target of nutrition research in MS is the gut, the location of 70% of the immune system. Here lies the gut microbiome, a large collection of health-promoting and unhealthy bacteria. Since MS is a disease caused by an overreaction of the immune system, and immune cells in the gut communicate with the rest of the body, the gut microbiome is a sensible target for research.

A recent study of 71 people with MS compared with 71 people without the disease conducted by a group called the MS Microbiome Consortium found that certain types of unhealthy bacteria (*Akkermansia muciniphila* and *Acinetobacter calcoaceticus*, which promote inflammation in the body) are more common in people with MS. On the other hand, other types (such as the anti-inflammatory bacteria *Parabacteroides distasonis*) found in healthy people are less common in people with MS. This research confirmed the findings of another study from Harvard University, which also reported that people with MS who were using a disease-modifying therapy (DMT) had more protective bacteria in the gut than those who weren't on a DMT.

The research is still early and diets to promote a healthier gut microbiome have to be tested in large groups of people, but they are very promising, offering a potential way to reverse inflammation and stall MS disease activity, according to one of the researchers, Ilana Katz Sand, MD, Associate Professor of Neurology at Icahn School of Medicine at

Mount Sinai in New York City. Dr. Katz Sand is currently conducting a small study with 36 people with MS to see if a Mediterranean-type diet (consisting mostly of fruits, vegetables, and "good" fats like fish, avocados, and nuts) can change the composition of the gut microbiome and lessen inflammation.

Intermittent Fasting

Intermittent fasting—the practice of restricting eating to 12-hour periods of the day or eating 500 calories a day a few times a week—is also of interest to MS researchers.

Intermittent fasting first came to the public's attention as a method of dieting, and

it actually has a pretty solid foundation in

science for weight loss, according to

Mark P. Mattson, PhD, who has conducted both

human and animal research

as chief of the Laboratory of

Neurosciences at the National Institute

on Aging in Baltimore, MD. In one study of 107

overweight women published in the *International Journal of Obesity*, Mattson and his colleagues found that those who reduced their food intake to 650 calories per day twice a week and consumed up to 2,500 calories on other days lost about 14 pounds over 6 months. In comparison, subjects who dieted daily, eating about 1,450 calories a day, lost 12 pounds. Both groups ate about the same number of calories per week, and 63% of intermittent dieters stuck with the diet for at least a month, versus just 46% who were still dieting on a daily basis 30 days later.

Surprisingly, what people eat on normal or fasting days on this type of diet doesn't appear to affect weight loss. A University of Illinois at Chicago study published in the journal *Metabolism* showed that when obese women



ate a high-fat diet for 8 weeks, they lost an average of 12 pounds and 3 inches from their waists as long as they fasted every other day, eating 400–500 calories between noon and 2 pm. Alternate-day eating also lowered their cholesterol levels.

It's best to consult your MS provider before you adopt this or any other diet—especially one that's experimental in MS like intermittent fasting—just to be on the safe side.

Besides weight loss, intermittent fasting may confer other health benefits, says Dr. Mattson, improving cognitive function and boosting mood in much the same way exercise does—by increasing levels of a chemical called brain-derived neurotrophic factor (BDNF). Preliminary research also suggests fasting may reduce the risk of asthma, dementia, cancer, diabetes, and cardiovascular disease.

And what about MS? Intermittent fasting shows promise for calming the immune response. Research conducted by Dr. Piccio and other scientists in the US and Italy in a mouse model of MS found that intermittent fasting improved the gut microbiome bacterial profile and reduced MS-like symptoms, such as difficulty walking and weakness in the limbs. In a subsequent small study in 16 people with relapsing MS, they also found positive changes in the composition of the bacteria in the gut microbiome as well as in levels of markers of inflammation. The team is now conducting a new trial in 40 to 60 people with MS comparing intermittent fasting to a standard western diet. "I don't think any physician working with this disease thinks you can cure MS with diet alone," Dr. Piccio said when the new trial was announced, "but we may be able to use it as an add-on to current treatments to help people feel better."

As far as safety, it appears that intermittent fasting is safe for most people, except those with diabetes, a history of eating disorders, and pregnant or breastfeeding women. Still, it's best to consult your MS provider before you adopt this or any other diet—especially one that's experimental in MS like intermittent fasting—just to be on the safe side.



Is the Supplement **Biotin** Safe to Take?

Many people with multiple sclerosis (MS) turn to complementary and alternative medicine (CAM) for relief of their symptoms. Biotin supplements are one popular form of CAM today, but they must be used with caution.

Biotin Basics

Biotin is a water-soluble vitamin, which means it is flushed out of the body and not stored in our fat. Biotin is involved in energy metabolism and the creation of fatty acids that might benefit neurological function.

There is no recommended dietary allowance (RDA) for biotin, but there is an adequate intake, which is 0.03 mg (30 mcg) a day. A deficiency in biotin, which is uncommon in humans, can result in neuromuscular (brain and muscle) dysfunction, baldness, and skin disorders.

Biotin can be obtained from food sources, such as egg yolks, milk, nuts, and grains. The bacteria in our gut microbiome (the collection of good and bad bacteria in our intestines) also make biotin.

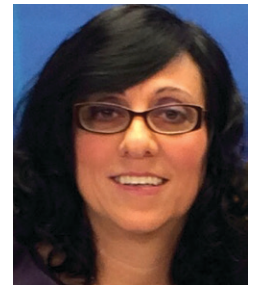
Studies in MS

Little research has been conducted to date investigating the use of biotin for MS, and results of these early studies have been mixed. A French team did a small study in 23 patients with secondary-progressive MS (SPMS) and primary-progressive MS (PPMS). The subjects were treated with 100 mg to 300 mg of biotin a day—very high doses—for about 9 months. Four patients with optic nerve involvement improved based on eye tests done within the 9-month period. Close to 90% of patients with spinal cord involvement (signaled by progressive weakness) also showed improvement within 2 months to 8 months. Overall, 91.3% of the patients experienced

improvements in MS symptoms. Although this was a small study, the results are interesting and provide hope for patients with progressive MS. There were no adverse effects except for mild diarrhea.

This early study result created great excitement about biotin as a treatment for progressive MS, but not all of the news is good. Research presented at a major MS conference showed increased inflammation and a dramatic increase in relapse rates for patients with progressive MS who were taking biotin. This study of high-dose biotin therapy also found an unexpected increase in inflammatory activity, including relapses and magnetic resonance imaging (MRI) activity, in patients with PPMS. The study included 41 patients with progressive MS treated with oral high-dose biotin (300 mg) for around 14 months. Participants had an average age of 54 years, and about half of the subjects

were male and half were female. Thirty-nine percent of the study subjects had PPMS and 61% had SPMS. The results showed a tripling of the annual relapse rate: It rose from 0.10 relapses in the year prior to starting biotin therapy to 0.27 relapses during treatment with high-dose biotin. Twelve relapses occurred in nine patients, including in two patients with PPMS who had never had an MS attack. Nine of the relapses required steroid therapy. Among the patients who experienced relapses, four had lasting disability. In addition, new or enlarged MRI lesions were detected in seven patients, and three of them experienced relapses. Of the



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Weight Control STRATEGIES FOR PEOPLE WITH MS

Obesity is a common problem for many Americans, affecting approximately 93.3 million adults (or nearly 40% of the US population). Obesity has links to multiple diseases, including diabetes, high blood pressure, and some cancers, which affect a person's quality of life and longevity. It has also been linked to multiple sclerosis (MS). That's important, because it's estimated that 21% to 33% of people with MS are obese.

"We have identified obesity in adolescent females as a definite risk factor for the development of MS," reports Barbara J. Green, MD, an *MS Perspectives'* advisor, "and we know that the prevalence of obesity has more than doubled in young adult women over the past 30 years, with a 3-fold increase in severe obesity (defined as a body mass index or BMI of over 40 kg/m²)." Obesity also likely plays a role in the development of MS in adult men and women.

She continues that, "MS is an inflammatory disease, and there is increasing evidence that fat tissue creates a pro-inflammatory state that might contribute to the development of an autoimmune inflammatory disease like MS." Being overweight or obese can also make your MS symptoms more severe, says Dr. Green. Unfortunately, the corticosteroid drugs used to treat MS relapses can lead to weight gain, while symptoms like tiredness and depression that can come with MS may make it difficult for people to exercise, which can compound their weight management efforts.

Also concerning is the impact of excess weight on mobility in people with MS. In a survey conducted by the North American Research Committee on MS (NARCOMS) in 2006, the presence of one or more conditions like obesity, high blood pressure, or diabetes as well as smoking or alcohol use was associated with a shorter time to ambulatory decline. "That means that people with these conditions experienced walking disability about 6 years earlier than people without these diseases or habits," says Dr. Green.

However, people with MS and obesity face significant obstacles in improving their diet and combating a weight



problem, acknowledges Dr. Green. "Often, people with MS are too fatigued to do the shopping or the cooking/meal preparation and either rely on others or on ordering premade food (restaurant, frozen foods, etc.), which can be highly processed and high in calories, sodium, sugar, and fat."

Obesity is a Chronic Disease

For all individuals, healthcare providers now have a new understanding that obesity is a chronic disease, just like MS. According to Jonathan Q. Purnell, MD, Professor in the Knight Cardiovascular Institute at Oregon Health & Science University in Portland, OR, like many vital systems

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(Continued from page 11)

that govern our survival, our bodies naturally have a weight set point (actually a range in body weight going around 5 pounds up or down) that is maintained through complex “sense and respond” systems. When that set point rises into the overweight and obese ranges, as it does for approximately 70% of the US adult population, and you go on a restricted-calorie diet and increase your exercise level, your body will fight to limit any weight loss and then get the weight back to its previous weight over time.

So what’s the point of even trying to lose weight then? Because there are so many benefits associated with losing even 5% of your current body weight if you’re overweight or obese. You’ll feel better for one, and probably have more energy. You’ll be able to move better, which means you’ll get more exercise and burn more calories. You’ll also reduce your blood pressure and cholesterol levels, and lower your risk of heart disease, diabetes, stroke, and cancer.

Weight Loss Strategies

“The key to successful, sustained weight loss,” Dr. Purnell says, “is to interfere with the way that the brain senses and responds to set point signals.” This can be done in a number of ways, he adds, such as modestly with diet and exercise as well as weight-loss medications, and better with obesity surgeries.

Lifestyle changes: No matter what you do, you have to eat less and, ideally, move more. The type of diet you choose is largely up to you and what you can be most successful with for the long term: Most studies show that various diets from a low-calorie to a low-carbohydrate to a low-fat diet can help people lose weight and that one is not superior to the other.

Says Dr. Purnell, “Whatever diet plan you choose, look to increase your intake of ‘real’ food that is not processed. As author Michael Pollan puts it in *The Omnivore’s Dilemma* and *In Defense of Food*: ‘Eat food. Not too much. Mostly plants.’”

Medications: People with a BMI over 30 kg/m² or a BMI of 27 to 30 kg/m² (see the box to determine your BMI) and a weight-related disease such as high blood pressure, high cholesterol, or diabetes may be candidates for weight-control drugs, according to Dr. Purnell. Six drugs (all available only by prescription except for orlistat) are currently approved by the Food and Drug Administration for this purpose:



What’s your BMI?

Body mass index (BMI) is the primary way that overweight and obesity are calculated today.

BMI (kg/m ²)	Weight Status
Below 18.5	Underweight
18.5 – 24.9	Normal or Healthy Weight
25.0 – 29.9	Overweight
30.0 – 39.9	Obese
40.0 and over	Severely obese

To calculate your BMI, divide your weight in pounds by your height in inches squared and then multiply the result by 703. Here’s an example of a BMI calculation for a person who is 154 lbs. and 5’4” (64”) tall:

$$[154 \div (64)^2] \times 703 = 26.4$$

You can also find a BMI calculator here: https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm

- Orlistat (Xenical® by prescription and Alli® over the counter) works by reducing the amount of fat that is absorbed from foods.
- Phentermine (Adipex®, Fastin®, Ionamin®) alters levels of the brain chemical norepinephrine, and may increase heart rate and blood pressure (an effect that can be dangerous for some people).
- Phentermine/topiramate (Qsymia®) is a combination of phentermine and an anti-seizure/anti-migraine drug that has been shown to improve the weight-loss effect of the first drug.
- Lorcaserin (Belviq®) affects another brain chemical, serotonin, and can improve appetite control.
- Bupropion and naltrexone (Contrave®) is a combination of an antidepressant and a drug used to manage drug and alcohol addiction. It works by blunting hunger pangs and food cravings.



- Liraglutide (Saxenda®), developed as a result of advances in the understanding of gut hormones, is a glucose-lowering drug that reduces appetite.

“Most of these drugs work by reducing hunger signals and increasing satiety [fullness] signals in the central nervous system,” he says. While they can be helpful, weight loss is both variable and modest with the drugs—in the range of 6% to 10% of initial body weight. This is enough, however, to reduce blood pressure and glucose levels, improve cholesterol levels, and increase your chances of staying free of diabetes. Furthermore, if a weight-loss medication is working, then it is continued lifelong. “It is only effective as long as it is in your system,” says Dr. Purnell. “If you stop the drug, the brain’s set point will bring you back to your old weight.” All of the drugs come with side effects, which may or may not affect you, and you can’t use the medication if you are pregnant or breastfeeding.

Obesity (bariatric) surgery: Two bariatric procedures have become mainstays for most patients with obesity and appear to be potentially beneficial for people with MS: gastric sleeve and gastric bypass, which are associated with weight loss of 25% to 30% of the initial body weight. Use of medications along with these procedures can enhance initial weight loss and help to keep the weight off in the long term, says Dr. Purnell.

“There are individuals with severe obesity who have failed repeatedly over many years with weight-loss

diets for whom I recommend a consultation for bariatric surgery,” says Dr. Green. “Although there are not a lot of data yet specifically addressing this approach in MS, there are small studies that do not appear to show any undue risk for people with MS in regard to their disease or the use of disease-modifying therapies.”

For example, one study of 16 severely obese people with MS published in the *Journal of Obesity* in 2017 showed an improvement in walking speed and an average 31.5% weight loss among people who had bariatric surgery compared to controls. Among the patients in the study, there were two major and four minor complications as a result of the surgery.

“I have had a number of patients who underwent these procedures either before an MS diagnosis or after,” she adds, “who have had significant weight loss that was sustained over several years, and they are pleased with both the functional and cosmetic benefits (such as an improved self-image) of the surgery.”

Opting for bariatric surgery should not be taken lightly, according to both experts, however. And even though weight loss after these procedures can be variable, ultimately the most successful patients still work hard to ensure they are following recommendations for a healthy lifestyle. If you don’t, you are at risk for regaining much of the lost weight. Unfortunately, there’s just no way around the basics of eating less and moving more!

(Continued from page 10)

28 patients who remained on high-dose biotin for a year or longer, Expanded Disability Status Scale scores rose in one, while 17 remained stable and 10 declined.

Biotin Can Change Blood Test Results

It’s also important to know that biotin interferes with the results of blood tests we do regularly and can lead to false results. For example, it affects thyroid tests, cardiac enzyme tests, and a few tests for cancer markers. Because of this, the Food and Drug Administration (FDA) released a Safety Alert in late 2017 warning that biotin-related falsely high or falsely low test results may lead to misdiagnosis or disease mismanagement. According to the alert, “The FDA has seen an increase in the number of

reported adverse events, including one death, related to biotin interference with lab tests.”

More studies are needed to evaluate the efficacy and safety of high-dose biotin. A multicenter, international phase III trial evaluating the efficacy of biotin in MS is in progress, including at Mount Sinai, with results expected in 2019.

Based on the findings from the small studies reported to date, caution is advised in the use of high-dose biotin, which can be obtained at compounding pharmacies or over the counter. If you are taking high-dose biotin (and we don’t recommend you do unless you have talked it over with your MS provider first or you are participating in a clinical trial), stop taking the supplement around 7 days before you have any blood tests.

Ask the Clinician

Q. What do MS specialists tell their patients about the best diet for their MS and for weight loss?

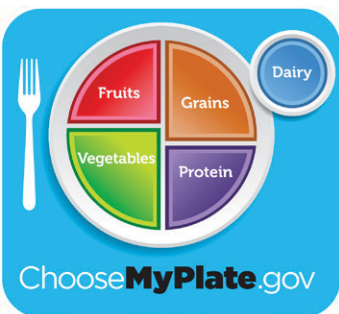
A. Although there is no specific diet for MS, I usually recommend the Mediterranean diet for multiple reasons, such as for cardiovascular health and weight control. This diet is centered on plant-based foods, such as fruits and vegetables, whole grains, legumes (beans), and nuts. In addition, you replace butter with healthy fats such as olive oil and use herbs and spices instead of salt to flavor foods. In addition, you limit red meat to no more than a few times a month.



Aliza Ben-Zacharia,
DrNP

Mostly, I instruct my patients to eat nutrient-dense foods rather than calorie-dense foods. Nutrient-dense foods include lean proteins, colorful vegetables and fruits, brans, legumes, whole grains, nuts, and seeds. Calorie-dense foods include processed products such as cookies and cakes.

I show my patients the government's MyPlate illustration (see below) to guide them in understanding portion sizes.



I also advise them to think about and plan meals ahead of time. You want to stock up on healthy foods to have them available at home for cooking and snacking. In particular, you always want to have fresh and frozen

fruits and vegetables, whole-grain products, healthy fats and oils, dairy products and eggs, and omega-3-rich foods (salmon, halibut, sardines, albacore, trout, herring, walnut, flaxseed oil, and canola oil) on hand. When you

have multiple healthy options at home, you are more likely to eat healthy.

— Aliza Ben-Zacharia, DrNP
Nurse Practitioner, Neurology Assistant Professor
Associate Director of the Center for Nursing Research and Innovation
The Corrine Goldsmith Dickinson Center for Multiple Sclerosis
The Mount Sinai Hospital
New York, NY

A. When discussing diet, I tell my patients to write down EVERYTHING they eat for 72 hours—from the teaspoon of sugar that goes into their coffee to the last few bites of ice cream they eat because their kid can't finish a cone. If they like to use a smartphone, I tell them to download the free My Fitness Pal app to track their food intake. I like this app because it breaks down the foods you eat into carbohydrates, proteins, and fats, so you can tell how much you're getting of each of these macronutrients. The app also counts calories for you, and you can set a target weight and calorie count. You and you alone can see the information you put into the app, and there are built-in incentives to help keep you going.



Barbara S. Bishop,
MS, ANP-C, MSCN, CNRN

In terms of what you're eating, sometimes it's obvious where you can cut out "bad stuff." For example, if you are drinking too much soda, you can start by reducing it by 8 oz. a day and drinking water instead. Other times, it's not that obvious how you are overeating or making poor food choices. I find the app helps people to see their patterns, both good and bad. It helps them gain control—and your

diet is one thing you can control, especially if you feel out of control of your MS.

I always tell patients that whatever they've heard, monitoring calories continues to be important. People underestimate what a portion size is so they eat more calories than they think. They also overestimate how many calories they burn if they exercise. Thirty minutes of moderate exercise does not burn up a Big Mac or an ice cream sundae! (You would have to exercise for hours to equal that calorie count.) Again, this is where tracking your intake either by writing it down or in the My Fitness app is extremely beneficial.

Tackling your diet is about getting healthy and getting to your best state of wellness. It's not about just weight loss, although weight will come off as a benefit of eating healthy. Getting to the right balance of carbohydrates, proteins, and healthy fats in your diet and the right portion sizes will equal an appropriate calorie count for you. And by eating healthier, you will improve your energy level and endurance, and have better control of your MS symptoms and other conditions like high blood pressure and diabetes. You may even need less medication for these other problems.

— Barbara S. Bishop, MS, ANP-C, MSCN, CNRN
Nurse Practitioner
Virginia Beach Neurology
Virginia Beach, VA

A. There is no one magic diet for MS, and each person will respond differently to a diet plan, and each person will have different food preferences. A diet plan that benefits you may not be good for someone else.

Still, there are a few things we have learned from research on different diet plans and on diet and MS. We know that:

1. A balanced diet rich in vegetables, fruits, and proteins is a good place to start for everyone.
2. Limiting unhealthy fats and increasing "good" fats rich in omega-3 and omega-6 fatty acids is good for your cardiovascular health and your brain.
3. A diet high in sugar and starchy carbohydrates is not good for you.
4. Whenever possible, choose fresh, unprocessed, whole



Tracy Walker,
F-NPC

foods. If you can afford organic produce and meat, choose that.

5. Limit *when* you eat each day. That means eat all meals and snacks during a 12-hour time span. Then only drink water or non-caloric beverages during the other 12 hours. This allows your body to focus on repair and restoration for at least half the day instead of processing fuel around the clock.
6. Vitamin and mineral supplements can be helpful, but be sure to ask your healthcare provider and/or pharmacist to compare the ingredients of the product you choose against your medication list to check for interactions. Also, start new supplements one at a time in case you have a reaction (that way you'll know which product is responsible for the side effect).
7. Drink lots of water!

— Tracy Walker, F-NPC
MS Institute at Shepherd Center
Atlanta, GA

A. I discuss diet and weight and their impact on overall health and on MS with my patients on a regular basis. Patients will often bring up their inability to lose weight and how frustrated they are. We know dieting is hard, so I emphasize setting small, achievable goals and counsel them that it is a slow process. I discourage use of weight-loss products/supplements or radical or deprivation-type diets, which can lead to quick weight loss but often rapid regain. I look at the content of my patients' diets and discuss calories, and I typically recommend moving to the Mediterranean diet or something similar for best health. I also encourage patients to increase their activity level with something like Fitbit step-counting, short walks, yoga, swimming, etc. And I advise them to examine their personal situation in terms of what gets in the way of them changing their diet and exercise habits for the better, so they can be successful at maintaining a healthy weight.



Barbara J. Green,
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— Barbara J. Green, MD
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