

Vitamins, Minerals & Herbs in MS

AN INTRODUCTION



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Eric (front cover), diagnosed in 1951.

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Introduction

This booklet focuses on the use of popular vitamins, minerals and herbs by people living with multiple sclerosis (MS). The use of these supplements is one form of complementary and alternative medicine, which we'll call CAM.

CAM is difficult to define, in part because its contours continually shift. One definition describes CAM as therapies that are not commonly taught at U.S. medical schools or commonly available at U.S. hospitals. Almost by definition, then, this booklet explores controversial and incompletely studied treatments.

Accordingly, this booklet is **not** intended to be a primary source for understanding the standard, evidence-based treatment of MS. Rather, it is intended for those who already use, or at least understand, the benefits of mainstream medical interventions. Over the last three decades, medications have been developed that modify or slow down MS. Early and ongoing treatment with a disease-modifying medication is a key component of MS management for the majority of people with MS.

Despite these medications, MS remains a chronic disease that can produce a variety of challenging and unpredictable symptoms. For this and other reasons, most people with MS use some forms of CAM therapy *in addition to* treatments prescribed by their healthcare providers. That means that CAM therapies are usually used in a **complementary**, rather than an alternative, manner.

Most treatments, including the ones listed in this booklet, have risks associated with them. This booklet will identify some of the risks associated with selected vitamins, minerals and herbal supplements in MS. However, because of a lack of well-conducted scientific studies and the enormous variation in individual clinical situations, not all risks can be identified. Always discuss your personal situation with your physician before using any CAM therapy.

For additional information on supplements and other forms of CAM, see the reference section on page 23.

General Information for Evaluating Supplements

To weigh the pros and cons of dietary supplements fairly requires a basic understanding of the role of the immune system in MS. Thoughtful supplementation also requires an understanding of evidence about safety and effectiveness, dosing issues, and the law relating to supplements.

Impact of MS on the immune system: In MS, the immune system actively damages myelin (the protective covering of nerves) in the brain and spinal cord (the central nervous system). Most treatments for MS involve the attempt to down-regulate the immune system.

The details of the immune system are very complex, but in general it may be best to assume that in MS, immune

stimulation may be dangerous and immune down-regulation may be beneficial. Accordingly, supplements that are supposed to “boost” or “improve” immune function may be the **worst choice** for people with MS.

Unfortunately, the immune effects of many supplements are poorly understood. Often the use of supplements requires users to make reasonable inferences based on limited evidence. However, inferences may seem reasonable and still be incorrect.

Evidence of Effectiveness, Safety and Risks: In addition to adverse immune system effects in MS, supplements may provoke MS symptoms, interact with common MS medications, or have serious side effects. More than 200 different supplements may produce these types of negative effects in MS. Some of these supplements will be discussed in this booklet. A more detailed listing of these potentially harmful supplements may be found in *Optimal Health with Multiple Sclerosis: A Guide to Integrating Lifestyle, Alternative, and Conventional Medicine*, by Allen Bowling, M.D., Ph.D. (Page 378).

Often what is used to support the use of supplements is simply a story, sometimes called “anecdotal evidence.” This is the least reliable of all the various kinds of evidence. Particularly in MS, where symptoms come and go unpredictably, improvement in symptoms may appear to be related to the use of supplements when it is not.

The best evidence is generally obtained from carefully controlled trials among a large group of people with MS. Another source of evidence is animal studies. These studies

can be helpful, but may also be misleading because substances may work very differently in animals than they do in humans. Evidence can also be obtained from experiments done in laboratories. Again, these studies are helpful, but can't be considered definitive in any way.

Dose Matters: Dose is a critical factor with any medication or supplement, and more is **not** always better. Supplements may have different effects depending on the size of the dose that is taken. While a small amount of certain supplements may be useful, larger amounts may be dangerous. Proper dose should always be considered before beginning supplementation. Therein lies a challenge however, because the ingredients in supplements are generally not clearly labeled.

Absence of Regulation: In the United States, supplements are not regulated in the same rigorous way that medications are. Before being marketed, medications must undergo controlled clinical trials that demonstrate their effectiveness and safety for the treatment of particular medical conditions. This is in sharp contrast to dietary supplements. Manufacturers of supplements are not required to prove the effectiveness of their products or accurately report what is contained in them. As a result, supplements may contain varying amounts of the active ingredients and be of variable quality. Consequently, users of any supplements should be cautiously skeptical when reading marketing information from the seller and, in general, be mindful of the fact that the U.S. Food and Drug Administration (FDA) has not evaluated the product for efficacy or safety. For this reason, the labels of dietary supplements are not permitted to make specific claims to treat or cure any particular illness.

Specific Information about Select Vitamins, Minerals and Herbs

The number of available vitamins, minerals and herbs is too great to catalog here, so we have included those that many people with MS choose to use.

Vitamins

Vitamins are chemicals without caloric content that are necessary for health. The Food and Nutrition Board of the National Academy of Sciences has established a recommended daily allowance (RDA) or adequate intake (AI) for vitamins and minerals. Although there are technical differences between the RDA and AI, the term RDA will be used in this text. The RDA represents the minimum amount of each vitamin or mineral that we should obtain from our diet on a daily basis to avoid disease. On that point, there is little disagreement. On the other hand, the question of whether larger doses of vitamins are beneficial is controversial. Vitamins do not function in isolation from one another, but rather work in careful balance. Accordingly, a high concentration of one vitamin might cause a relative deficiency of another.

Dietary sources of vitamins, such as fruits and vegetables, appear to be preferable to vitamin supplements. Perhaps this is because fruits and vegetables contain vitamins in useful

proportions, as well as fiber, minerals and other unidentified chemicals found in plants that together play a role in good nutrition and disease prevention.

Vitamins that seem of particular interest to people with MS include vitamin D, the antioxidant vitamins, vitamin B6 and vitamin B12.

Vitamin D

Vitamin D is a hormone, or chemical messenger, in the body. Dietary sources of vitamin D include fish and fortified foods such as dairy products and breakfast cereals. Vitamin D is produced in the skin in response to sunlight, but this production is limited by geographic location, skin pigmentation and season.

Multiple studies have associated higher vitamin D intake and higher vitamin D levels with lower risk of developing MS. For example, one large-scale study involving nurses suggested that those who had higher vitamin D intake, in the form of multivitamin supplements, may have had a reduced risk of developing MS. Another study involving people in the military similarly found that higher blood levels of vitamin D seemed to protect people from developing MS.

Studies in the laboratory and in people with MS indicate that vitamin D may also alter immune function in ways that have beneficial effects on the course of MS. Several studies have shown that low vitamin D levels are associated with an increased risk of having attacks (also called relapses or exacerbations) and developing new MRI lesions. Low levels have also been associated with increased levels of disability.

Importantly, these studies only demonstrate an association of low vitamin D with attacks, MRI lesions, and disability — these studies do not definitively show that taking vitamin D supplements causes reduction in attack risk or disability progression. To determine whether taking vitamin D supplements has such beneficial effects would require “intervention” studies, similar to those done with experimental MS drugs, in which vitamin D supplements are given to a large group of people with MS and the course of their disease is compared to that of a control group that does not take vitamin D. The results from this type of intervention study in MS are not yet available. As a result, the information to date about the effect of vitamin D on the course of MS is suggestive but not definitive.

Vitamin D also plays an essential role in bone health. There is increasing awareness that low bone density (osteoporosis) may be under-diagnosed and under-treated in many people, including those with MS. Importantly, many people with MS have risk factors for developing osteoporosis:

- female gender
- decreased physical activity
- decreased exposure to sunlight
- frequent treatment with steroids

People with MS should talk with their healthcare providers about whether blood testing of vitamin D levels is reasonable. Those who have risk factors for osteoporosis may need bone density tests.

Supplementation with vitamin D and calcium should be discussed with health professionals. The RDA for vitamin D is 600–800 IU for adults. Vitamin D3 rather than D2 is generally considered the preferred form of vitamin D. Doses greater than 4,000 IU daily may cause toxic effects and should not be used unless prescribed by a physician.

The Antioxidant Vitamins

A free radical, also called an oxidant, is a molecule that contains an unpaired electron. The unpaired electron is highly unstable and generally allows the molecule to react with other nearby substances. The antioxidant vitamins include vitamin A (or its safer form, beta-carotene), vitamin C and vitamin E. As the name implies, antioxidants tend to decrease the damage caused by oxidants or free radicals. Antioxidant vitamins are generally available in fruits and vegetables.

Preliminary evidence suggests that the damage caused by free radicals may be involved in the disease process in MS. However, there are no well-documented published studies of people with MS that show a clinical benefit related to antioxidant supplements.

The safety of taking antioxidants in supplement form for people with MS has not been clearly established either. One small, five-week study indicates that antioxidants are safe for people with MS, but the study is too small and short to be conclusive.

There is an important theoretical risk to consider. Antioxidant vitamins stimulate the immune system in laboratory experiments and in some groups of people. In MS, where an overactive immune system appears to be part of the disease process, stimulation may be dangerous.

In summary, there is limited evidence suggesting that antioxidants may be beneficial but there are theoretical risks involved, too.

The most reasonable course may be for people to obtain antioxidants by eating 2–4 servings of fruits and 3–4 servings of vegetables every day. If antioxidant supplements are used, it may be best to use them in moderation.

Specific Issues Regarding the Antioxidant Vitamins

Vitamin A and Pregnancy

Vitamin A is necessary for vision and promotes normal growth and differentiation of cells in the body. Vitamin A is fat soluble, and is found in liver, eggs and cod liver oil.

Fat soluble vitamins are stored in the body and high levels may accumulate over time. The RDAs for women and men are 2,300 and 3,000 IU per day, respectively. In general, people should avoid doses in excess of 10,000 IU per day.

Some studies have concluded that vitamin A in amounts greater than 10,000 IU may produce birth defects. Pregnant women taking cod liver oil (which contains vitamin A) must use caution to ensure that they are not consuming excessive

amounts of vitamin A. In general, pregnant women should obtain vitamin A in the form of beta-carotene found in fruits and vegetables.

Vitamin C and Urinary Tract Infections

Vitamin C, also known as ascorbic acid, plays a role in building and maintaining body tissues. Vitamin C is readily available in foods such as citrus fruits and tomatoes. The RDAs for this vitamin are 90 milligrams for men and 75 milligrams for women under normal circumstances. The RDA for smokers includes an additional 35 milligrams.

For a variety of reasons, people with MS tend to be at an increased risk for urinary tract infections. Some people supplement with vitamin C to acidify the urine, thereby creating a challenge to infection-causing bacteria. However, the weight of evidence suggests that vitamin C does not acidify urine. There is more evidence to support the use of cranberry to prevent urinary tract infections than there is for vitamin C.

Whether a higher intake of vitamin C is beneficial is controversial. The proper dose of vitamin C (and all other vitamins) for people with MS is unresolved. Daily doses greater than 2,000 milligrams may cause diarrhea or kidney damage.

Vitamin E and Polyunsaturated Fatty Acids (PUFAs)

Vitamin E prevents oxidative damage to cell membranes or linings and can be obtained from vegetable oils, fruits, vegetables, nuts, and meat.

The body's requirements for vitamin E increase as the intake of polyunsaturated fats (PUFAs) in the diet increases. This is relevant to MS because some people with MS increase their consumption of PUFAs in the hope that PUFAs are beneficial in MS. This is a complex topic and beyond the scope of this review. For more information see *Optimal Health with Multiple Sclerosis: A Guide to Integrating Lifestyle, Alternative, and Conventional Medicine*, by Allen Bowling, M.D., Ph.D. (Page 159).

In general, the additional amount of vitamin E needed in diets that are high in PUFAs is quite low: approximately 0.9-1.3 additional IU of vitamin E is needed for each additional gram of PUFA. This means that a person consuming 25 grams of PUFAs daily needs only an additional 20-30 IU of vitamin E daily.

The RDA for vitamin E is 22 IU for both men and women. Daily vitamin E doses greater than 1,500 IU should be avoided. One meta-analysis (a study that combines data from multiple previous studies) identified an increased mortality among users of 400 IU or more of vitamin E. And among smokers, vitamin E may increase the risk of lung cancer. Consuming substantially lower doses of vitamin E (in the range of 100 IU or less) may be preferable in light of the unresolved questions about the immune effects of vitamin E in people with MS.

Vitamin B6

Also known as pyridoxine, vitamin B6 is found in a wide variety of foods, including fish (especially salmon and tuna fish), pork and chicken, beans, bananas and many vegetables.

Vitamin B6 is needed in amino acid conversions. Sometimes people with MS take a B complex vitamin based on the belief that it may help with their energy. Sometimes such B complex vitamins have relatively high doses of vitamin B6.

The RDA for vitamin B6 is 1.3-1.7 milligrams for adults ages 19–50.

High doses of pyridoxine can cause numbness, tingling or pain. Although this condition is generally reversible when supplementation is discontinued, symptoms associated with B6 overdose might mimic MS symptoms. High doses of vitamin B6, such as 1000 milligrams per day, seem to pose the greatest risk of these symptoms. However, doses as low as 50 milligrams per day may cause nerve symptoms as well.

Vitamin B12

Also known as cobalamin, vitamin B12 is required for the production of red blood cells and for proper function of the nervous system. In fact, a severe vitamin B12 deficiency produces neurological symptoms similar to those seen in people with MS. Vitamin B12 is found in eggs, meat, poultry, shellfish and dairy products; the RDA is 2.4 micrograms per day for both men and women.

A variety of observations have suggested that there may be a relationship between vitamin B12 levels and MS. For example, some studies indicate that people with MS have low levels of vitamin B12 in their blood more frequently than the general population.

For all people with MS to supplement with vitamin B12 on the basis of these associations would be a mistake.

However, vitamin B12 deficiency can be evaluated through a blood test. People with low levels should use vitamin B12 supplementation. For people with MS with normal levels, there is no evidence that vitamin B12 supplementation either improves neurological symptoms or favorably alters the course of the disease.

Minerals

Minerals are elements widely distributed in nature that perform diverse and critical roles in human health and disease. Three minerals — selenium, calcium and zinc are discussed here.

Selenium

Selenium is a mineral that has antioxidant effects. For a brief review of the relevance of antioxidants in MS see page 8. As with the other antioxidants, it is difficult to determine the exact effect that selenium has on people with MS. Good sources of selenium include seafood, legumes, whole grains, low-fat meats and dairy products.

Some studies indicate that selenium levels may be lower in people with MS than in the general population. Partly based on that observation, some have speculated that increased amounts of selenium might have beneficial effects in people with MS. However, in a study using laboratory animals, selenium supplementation worsened an MS-like disease.

Furthermore, selenium may increase the immune response, which may be undesirable in people who have MS.

For those 14 years of age and older, the RDA of selenium is 55 micrograms. Until more information is available, it may be best for people with MS to obtain selenium from foods or to use selenium supplements only in moderation. Toxic effects may occur with daily doses greater than 400 micrograms.

Calcium

Important in the formation of teeth and bone and in the regulation of many body processes, calcium is the most abundant mineral in the human body. Good food sources for calcium include dairy products, eggs and green leafy vegetables.

An old hypothesis about the cause of MS connected it to calcium intake. Based on the studies of populations, the incidence of MS appeared linked to high intake of milk during childhood followed by a large or sudden reduction in milk drinking during adolescence. Very little evidence supports this hypothesis.

On the other hand, calcium is a critically important supplement for those who are at risk for osteoporosis. As indicated in the section on vitamin D above, many people with MS have risk factors for osteoporosis.

The RDA for adults is 1,000–1,200 milligrams of calcium per day. To avoid possible toxic effects, the maximum daily

dose should be 2,000 milligrams or less in those over age 50 and 2,500 milligrams or less in those between the ages of 19 and 50.

Zinc

Zinc is a mineral that plays a role in many different processes in the body. The results of limited studies of MS and zinc are unclear. Some studies indicate that zinc levels are low in people with MS. Other studies indicate that zinc levels are high in MS; that zinc may activate the immune system; and that zinc supplementation may worsen an animal model of MS.

High dose supplementation with zinc can cause a deficiency of copper. Copper deficiency may then cause *copper-deficiency myelopathy*, a condition which causes neurological symptoms that may mimic the symptoms of MS.

The RDA for zinc is 11 mg for men and 8 mg for women. Given the uncertainties about zinc and MS, it would seem preferable for people with MS to avoid doses of zinc in excess of the RDA.

Herbs

The word herb generally refers to a plant, or part of a plant, that can be used for medicinal purposes. Herbs, like drugs, interact with the cells of the body and can sometimes produce changes in body processes. The changes produced by both herbs and drugs may be beneficial, but they may also be harmful.

To minimize the risk of harmful side effects, herbs should only be used with caution. Herb users should be aware of proper dosing, potential side effects, and potential drug-herb and herb-herb interactions. It is important to recognize that there are many unknown aspects to herbs. Specifically, herbs contain many different chemicals. The effects of these chemicals on the body, on different diseases (such as MS), and on drugs have not been fully determined. In addition, the quality and composition of herbal preparations currently marketed in the United States are extremely variable.

The herbs described below are among those commonly considered to have potential relevance to people with MS.

Ginkgo Biloba

Ginkgo comes from one of the oldest tree species and has been used in China for medicinal purposes for thousands of years. Some, but not all, studies indicate that ginkgo may improve cognitive function in healthy people and also in those with dementia. However, ginkgo does not appear to improve cognitive function among people with MS. One small study in MS indicated that ginkgo may improve fatigue.

Ginkgo has antioxidant effects. It also inhibits a substance known as platelet activating factor (PAF). By inhibiting PAF, ginkgo can cause a decrease in the activity of certain immune cells. These activities provide theoretical support for the use of ginkgo to treat MS.

Ginkgo has been studied in both the animal model of MS and in people with MS. In some animal model studies, ginkgo decreases disease activity. Two studies have been done in people. One suggested a benefit, but the larger of the two trials suggested no benefit. In that study, ginkgo was used to treat exacerbations, or attacks, of MS. The study did not consider whether ginkgo might have a role in preventing attacks or in improving MS-related cognitive dysfunction.

Few serious side effects with ginkgo supplementation are known. Ginkgo may inhibit blood clotting and therefore should be avoided by people with bleeding disorders, those who take blood-thinning medications, and those undergoing surgery. Importantly, ginkgo may interact with many different prescription medications so its use should be discussed with healthcare providers.

Echinacea

Echinacea is a flowering plant native to North America and a member of the daisy (Asteraceae) family. Of the three species available, the best studied is *Echinacea purpurea*.

Some studies suggest that echinacea may be helpful for decreasing the duration and symptoms of the common cold, but many of these studies have been criticized by scientists for being poorly designed and performed. No definitive conclusion can be drawn regarding the efficacy of echinacea to treat colds.

Because viral respiratory infections may be linked to exacerbations or acute attacks of MS, treating colds or trying to prevent them

with echinacea is an appealing strategy. The problem is that echinacea may stimulate the immune system. As has been described above, this is a theoretical risk for people with MS because their immune systems are already inappropriately stimulated. No study has been done to investigate this theoretical risk in people with MS.

St. John's Wort

St. John's wort is a yellow flower that grows in many parts of the world. It is generally used as an antidepressant. Many, but not all, studies indicate that St. John's wort indeed has antidepressant effects. St. John's wort is generally well tolerated and no reported study has identified effects on the immune system that could be concerning to people with MS.

Interaction with other medications is one important risk of using this herb. St. John's wort appears to alter the body's metabolism of certain drugs, which may include birth control pills and drugs commonly used to treat heart disease, seizures, certain cancers and depression. Medications taken by people with MS that could possibly be affected by St. John's wort include alprazolam (Xanax[®]), carbamazepine (Tegretol[®]), imipramine (Tofranil), phenobarbital, phenytoin (Dilantin[®]), primidone (Mysoline[®]), and many different types of antidepressants, including tricyclic antidepressants (such as nortriptyline (Pamelor[®]) and amitriptyline (Elavil[®]), selective serotonin reuptake inhibitors (SSRIs) (such as fluoxetine (Prozac[®]), paroxetine (Paxil[®]), and sertraline (Zoloft[®]), and monoamine oxidase (MAO) inhibitors.

There is a relatively high incidence of depression among people with MS. It is important to recognize that depression should not be self-diagnosed or self-treated. If you think that you may be a candidate for treatment with St. John's wort, you should first seek a professional evaluation. St. John's wort is **not** suitable for anyone with severe depression.

Valerian

The unpleasant-smelling root of a flower called valerian is sometimes used as a sleep aid. (It is also sometimes used in root beer!) People with MS may have difficulty sleeping, and difficulties with sleep may contribute to MS-related fatigue. Thus, a sleep aid may be very useful to some people with MS.

A few well-designed trials not involving people with MS show that valerian can decrease the amount of time required to fall asleep without residual feelings in the morning. Valerian is usually well tolerated. However, its immune effects have not been studied.

People with fatigue should consider the possibility that their fatigue may worsen when they take valerian as it may have a lingering sedating effect. Also, valerian may increase the sedating effects of prescription medications such as diazepam (Valium®), baclofen (Lioresal®), and tizanidine (Zanaflex®).

Asian Ginseng

Asian ginseng, also known as Panax ginseng, has been used for centuries by the Chinese for its supposed ability to enhance physical performance and resistance to stress and aging. The evidence in support of these vague claims is not

very strong. One small MS study reported improvement in fatigue. Further studies in MS are needed. Studies in the general population have failed to find consistent benefits.

An herb that increases energy and strength would be of great use to people with MS who sometimes suffer from debilitating fatigue. Although some evidence suggests ginseng might be safe and beneficial in people with MS, other experiments raise the possibility that ginseng may stimulate the immune system in ways that may be detrimental to people with MS. In short, for people with MS, there is too little evidence to conclude whether ginseng is safe or not, and too little evidence to indicate if it provides any therapeutic effects.

Cranberry

Cranberry is grown in bogs in North America for juice, jelly and seasonal decorations. Many people use the ripe fruit from this plant to prevent or treat urinary tract infections.

Evidence suggests that cranberries prevent bacteria from sticking to the cells that line the urinary tract. This unique action of cranberry is attributed to two compounds, fructose (a type of sugar), and another chemical known as proanthocyanidin. Some, but not all, clinical trials of cranberry have shown that the herb prevents urinary tract infections. There is also some evidence that cranberry may kill bacteria directly.

Cranberry has very few side effects. A few case reports have suggested that cranberry juice may interact with warfarin (Coumadin® — a medication to treat or prevent blood clots), resulting in excessive bleeding. On the other hand, a short clinical trial failed to detect such an effect.

Using cranberry tablets or juice to **prevent** urinary tract infections is reasonable for most people. Increased fluid intake and improved hygiene may also be helpful preventive measures. Cranberries should never be used to **treat** existing urinary tract infections. Urinary tract infections can have serious consequences for people with MS and require immediate antibiotic treatment from a physician to get them under control quickly.

Marijuana

Marijuana, which comes from the Cannabis plant, has been used for medicinal purposes for thousands of years. Marijuana contains chemicals known as cannabinoids that act on the central nervous system (CNS) in ways that may reduce some MS symptoms and perhaps slow disease activity. For more information about marijuana, visit [nationalMSSociety.org/marijuana](https://www.nationalMSSociety.org/marijuana).

Conclusion

People with MS often consider using complementary and alternative medicine (CAM) as part of their efforts to live well and manage the disease and its symptoms. Because dietary supplements are not regulated in this country, being an educated and careful consumer is critically important, particularly with biologically based therapies such as the dietary supplements described here.

Nowhere in this booklet do we recommend any particular vitamin, mineral or herbs. As with most CAM treatments, the evidence regarding dietary supplements is inconclusive. The lack of better evidence is frustrating. Nevertheless, an inquiry into CAM can also be rewarding.

It may help restore a sense of control and hope to people who are struggling with an unpredictable disease. Hope and a good quality of life are tightly linked, and both should be cultivated.

We hope this booklet provides enough useful and specific information to allow more informed decision-making about the supplements we described. Just as importantly, we hope that it provides a framework for thoughtful consideration of other CAM treatments not discussed here.

Resources

Online

- Regularly updated information focused on CAM and MS. This site is managed and maintained by Dr. Allen Bowling. Web site: neurologycare.net.
- The National MS Society offers local referrals, education programs, counseling, self-help groups, and other booklets and brochures on MS. Web site: nationalMSsociety.org

Books

There are many non-technical books on CAM. One book that specifically deals with CAM and MS is:

- Bowling A.C. **Optimal Health with Multiple Sclerosis: A Guide to Integrating Lifestyle, Alternative, and Conventional Medicine**. New York: Demos Medical Publishing, 2014. Web site: demoshealth.com. Tel: 800-532-8663.

Detailed technical resources include:

- **2014 Physicians' Desk Reference for Nonprescription Drugs, Dietary Supplements and Herbs**, Thomson Healthcare, NJ. Web site: pdrbookstore.com. Tel: 800-678-5689.
- Bowling AC. Complementary and alternative medicine: practical considerations. In Rae-Grant A, Fox R, Bethoux F, eds. **Multiple Sclerosis and Related Disorders: Diagnosis, Medical Management, and Rehabilitation**. New York: Demos, 2013, 243-249.

- Bowling AC. Complementary and alternative medicine: Risks and benefits. In: Samkoff L and Goodman A. **Multiple Sclerosis and CNS Inflammatory Disorders**. Hoboken, NJ: John Wiley & Sons, 2014, pp. 91-101.
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- Jellin J.M., Batz F., Hitchens K., et al. **Natural Medicines Comprehensive Database**. Stockton, CA: Therapeutic Research Faculty, 2015.
- Ulbricht CE, Basch EM, eds. **Natural Standard Herb and Supplement Reference: Evidence-Based Clinical Reviews**. St. Louis: Elsevier-Mosby, 2005.

* Note: The above-mentioned books may be available for loan at your local chapter of the National MS Society, or at your public library.

Sources of information on health fraud

- **National Council Against Health Fraud**. Web site: ncahf.org. Tel: 919-533-6009.
- **Quackwatch**. Web site: quackwatch.com.

Federal government sources

- **Federal Trade Commission, Consumer Response Center**. Investigates false advertising. 600 Pennsylvania Avenue, NW, Washington, DC 20580 Web site: ftc.gov Tel: 202-326-2222

The National MS Society is a collective of passionate individuals who want to do something about MS now — to move together toward a world free of multiple sclerosis.

We help each person address the challenges of living with MS through our 50-state network of chapters. The Society helps people affected by MS by funding cutting-edge research, driving change through advocacy, facilitating professional education, and providing programs and services that help people with MS and their families move their lives forward.



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**For Information:
1 800 FIGHT MS (1 800 344 4867)**