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MS Perspectives™

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Practical Insights on
Multiple Sclerosis



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MS Perspectives

Understanding

If you have multiple sclerosis (MS) or your healthcare provider suspects MS, you will undoubtedly be scheduled for a magnetic resonance imaging (MRI) scan. An MRI is one of the best tools doctors and nurses have to assist in diagnosing and managing MS, and since the 1980s, when the first MRI of the brain was performed, these scanning techniques have changed quite a lot.

Many patients with MS are very interested in hearing about their MRI results and what they mean for their health and the effectiveness of the therapy they are taking. In this article, we talk to two MRI experts about the basics of MRIs and the questions you should be asking about your MRI tests.

What Is an MRI?

An MRI is an imaging technique that uses radiowaves and a powerful magnet to take detailed pictures of your brain and spinal cord from many different angles. It's a painless test, but some people feel uncomfortable during an MRI because you have to lie still for about half an hour on a table in a tube-like structure that houses the magnet while the pictures are taken. The machine is also quite noisy while it's taking the images. The pictures are then translated by a computer into thin, slice-by-slice images of the brain and spinal cord that are reviewed by a radiologist and your MS team.

MRI scans can show lesions (also called plaques or white spots) in the brain and spinal cord that are inflamed or damaged, which can signal MS is present. These lesions are visible because there is a disruption in the blood vessels of the brain, which allows inflammatory cells and fluid into the brain and spinal cord.

"Lots of diseases can cause white spots on an MRI scan," says Guy Buckle, MD, Director of Neuroimaging Research at the Andrew C. Carlos MS Institute at Shepherd Center in Atlanta, Georgia, "but not all white spots indicate MS. They can also be caused by normal aging, migraine headaches, or high blood pressure. So in order to make a diagnosis of MS, the MRI results must be matched with physical symptoms that suggest MS." These symptoms include things like numbness and tingling in the legs and temporary loss of vision in one eye (a condition known as optic neuritis).

Types of MRI Images

Two types of MRI pictures are especially useful in MS:

- **A T1-weighted MRI scan with or without the contrast agent gadolinium.**
The contrast dye is injected into your veins to "light up" areas of active inflammation. It reveals new or reactivated old plaques, which show up as bright spots that last for several weeks and then fade. These plaques may

Disclaimer: The goal of this publication is to provide patients with multiple sclerosis with the latest information about the disease and its treatment. The information provided in *MS Perspectives™* is not a substitute for the advice of your healthcare nurse or doctor. Please consult a qualified healthcare provider for individualized care and information.

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Your MRI Results

help clinicians make a diagnosis of MS and can be a strong indicator of active disease. On a T1-weighted MRI scan where no contrast is used, chronic inactive plaques may show up as “black holes,” and indicate more severe tissue damage.

- **A T2-weighted MRI scan.** This type of scan can show your clinician both the number and size of lesions in your brain and spinal cord. Changes in T2 lesions are often used to follow patients with MS to see if their disease is progressing. “Lesions that appear more noticeable or intense than the rest of the brain, due to inflammation, swelling, or fluid that has replaced tissue, can be seen on T2-weighted sequences,” explains Matilde Inglese, MD, PhD, Associate Professor in the Departments of Neurology, Radiology, and Neuroscience at The Mount Sinai School of Medicine in New York City.

Changes in Space and Time

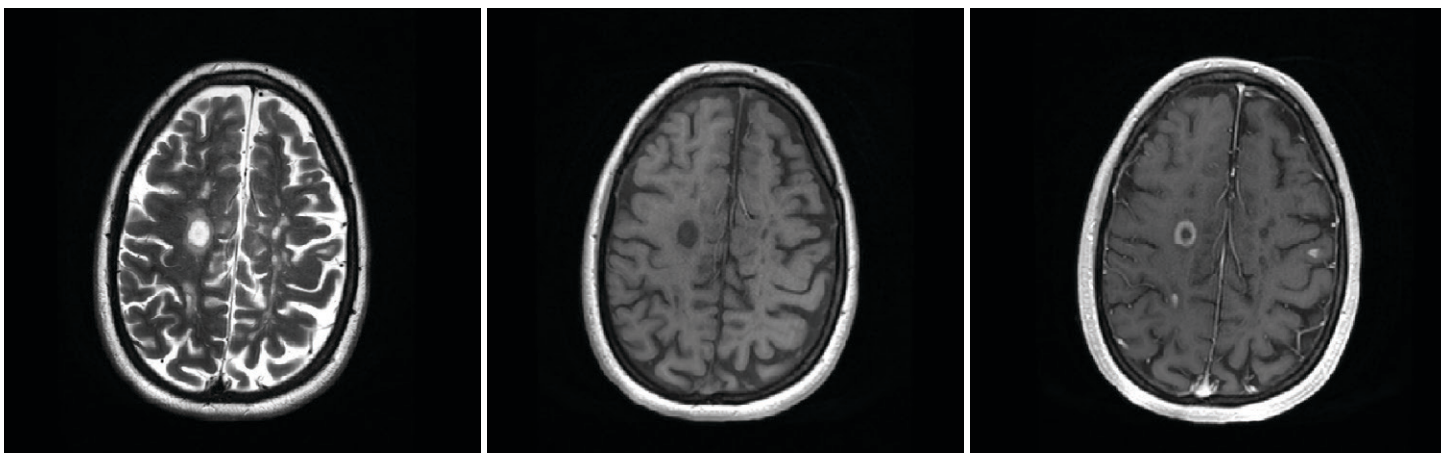
Healthcare providers also look for dissemination (changes) in space (DIS) and time (DIT) when reading MRI scans. “Dissemination in space means we are looking for

the presence of lesions in different areas of the brain and spinal cord. Dissemination in time means we are looking for lesions that build up over time—that is, new lesions that were not present on older MRI scans,” says Dr. Inglese.

MRI Guidelines

The Consortium of MS Centers (CMSC) has developed guidelines for when MRIs should be performed. Most healthcare providers use these guidelines in caring for people with MS.

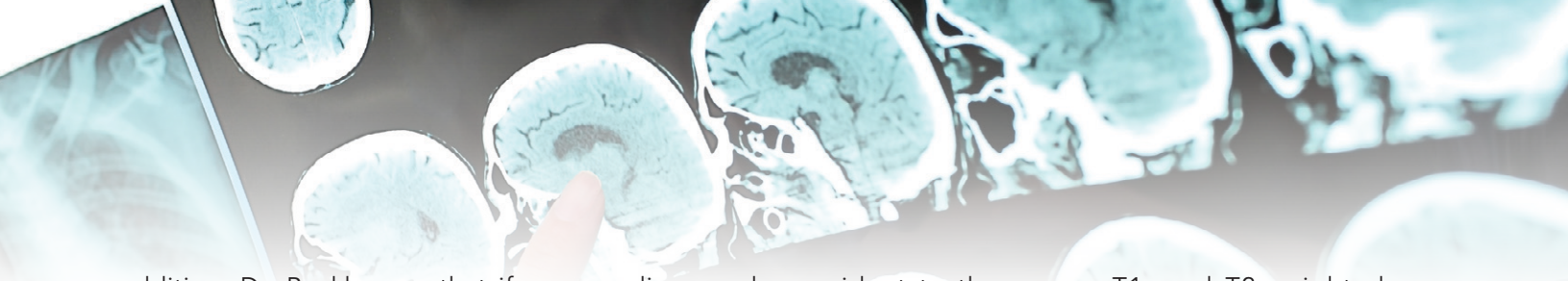
- The guidelines state that a brain MRI with gadolinium should be performed to confirm the diagnosis of MS.
- An MRI of the spinal cord is recommended if the brain MRI doesn’t clearly indicate MS or if your symptoms suggest MS lesions in your spinal cord.
- The CMSC recommends that an MRI be performed every 6 months to 2 years if you have relapsing MS. Your healthcare team will recommend the best schedule for you depending on your health status and your drug therapy. “Some providers may do an MRI every 3 months to 1 year,” says Dr. Inglese. In



MRI images from a 36-year-old woman with MS

In this series of panels, you can see a T2-weighted image of the brain (first panel on the left), a T1-weighted image in the middle, and then a T1-weighted image after the administration of the contrast agent gadolinium. The MS lesions appear very bright (hyperintense) in the T2-weighted image. Some of them are dark (hypointense) in the T1-weight image in the middle, and then show enhancement after administration of the contrast agent.

Images courtesy of Matilda Inglese, MD.



addition, Dr. Buckle says that if you are diagnosed with a clinically isolated syndrome (CIS), which is a first neurological episode that suggests MS, MRIs may be performed every 3 months if not more often until a diagnosis is made.

- Follow-up brain MRIs are recommended during treatment to determine if new lesions have developed or if lesions are inflamed (in which case they will “light up” with the gadolinium). These kinds of changes on the MRI scan may prompt a change in therapy.
- The guidelines also advise a follow-up scan if you have new or worsening symptoms and when you are starting on a new drug therapy. “It’s very important to have an MRI scan when you start or switch medications and then another one at 6 months,” says Dr. Buckle. “You need a baseline scan to compare the 6-month results to in order to tell if the medication is working for you.”

New MRI Techniques Used in Research

Routine MRIs are very important for the diagnosis of MS and for monitoring treatment, but there is much more going on in the brain and spinal cord than is currently

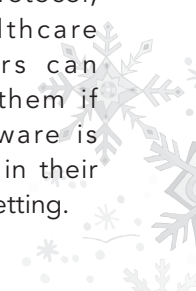
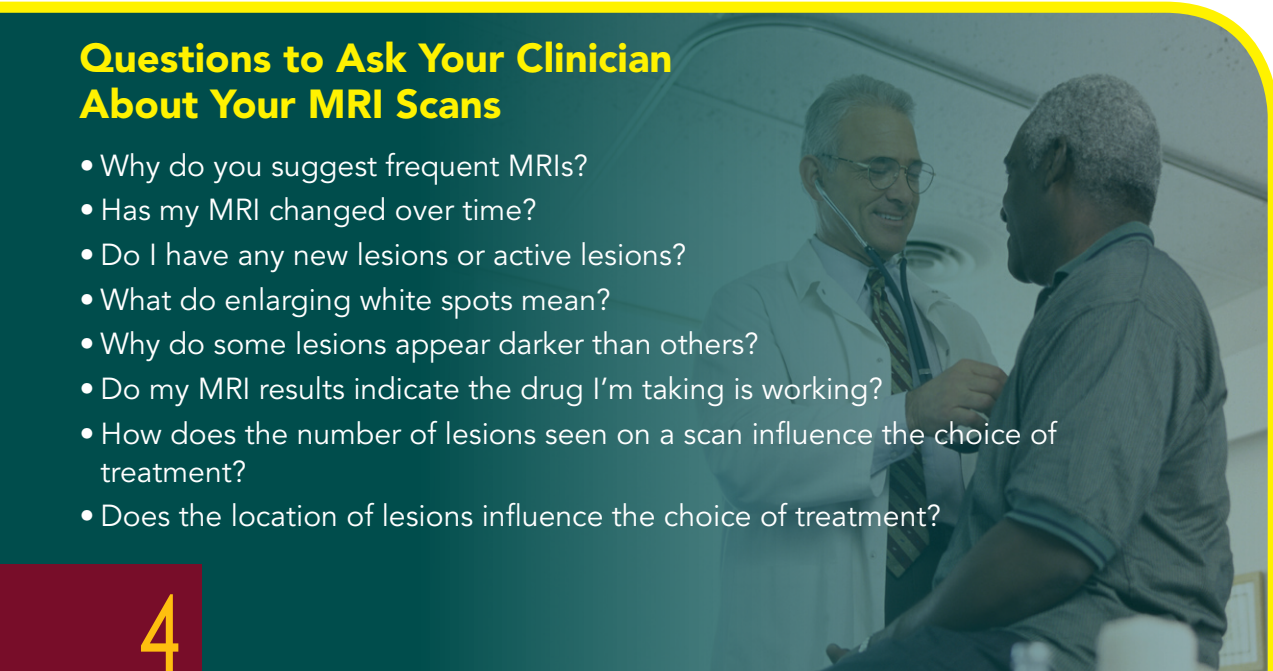
evident to the eye on T1- and T2-weighted scans. “Studies have shown that there are microscopic brain tissue abnormalities in the white matter of the brain,” says Dr. Inglese, “which contains the nerve fibers that send messages to and from the brain and rely on the myelin, the fatty coating that covers nerves and that is damaged and destroyed by MS.” There is also often damage to the gray matter of the brain, which makes up the outer surface of the brain and contains nerve cells. Until recently, there was no way to see this damage. “Today, however, we are using new sequences such as MR double inversion recovery (DIR), which uses pulses of energy to better distinguish between white and gray matter tissue and detect these finer changes,” reports Dr. Inglese. DIR and other new techniques, such as diffusion tensor imaging, which detects the motion of water molecules in tissue, and magnetization transfer imaging, which uses pulses of radiofrequency energy to get pictures of small vessels, are being used in research studies, but in the future may make it to clinical practice, she expects.

Dr. Buckle notes that measurement of brain volume is also increasingly being looked at on MRI brain scans. “We know that the brains of people with MS shrink faster over time than in people without the disease, and

we are testing new disease-modifying therapies to see if they are effective in preventing loss of brain volume,” he says. Currently, brain volume reports aren’t part of the standard and routine MRI testing protocol, but healthcare providers can request them if the software is available in their practice setting.

Questions to Ask Your Clinician About Your MRI Scans

- Why do you suggest frequent MRIs?
- Has my MRI changed over time?
- Do I have any new lesions or active lesions?
- What do enlarging white spots mean?
- Why do some lesions appear darker than others?
- Do my MRI results indicate the drug I’m taking is working?
- How does the number of lesions seen on a scan influence the choice of treatment?
- Does the location of lesions influence the choice of treatment?



Your Journey to..... WELLNESS *(Continued)*

In our third article in the journey to wellness series, we look at the spiritual connection—what is commonly called the search for meaning and purpose in our lives.

A belief in a higher power—be it God, Buddha, or Mother Nature—can give you the faith you need to deal with setbacks and to be proactive in managing your disease. Having a spiritual belief set can make you feel less alone if you believe that a higher power is looking after you or is with you, and attending church and other spiritual groups can give you the company and support of others. Likewise, a spiritual practice can help you find inner peace and calm in the face of illness and some positive meaning in your experience of the disease and your suffering. It can also help you discover your true, authentic self beyond your MS diagnosis.

Researchers have found that people live longer if they have a spiritual practice—perhaps because they have lower stress levels, better ways of coping, and a strong social connection. Other studies have shown that prayer and meditation are effective nondrug ways of controlling pain. And still other research, although controversial, suggests that when people pray for someone, that person

may have a better outcome than if people don't pray for him or her.

Here are three ways to improve your spiritual health:

Practice gratitude. Focusing on the positive aspects of your life rather than drowning in the negatives, including MS, can put your illness into perspective, helping you to accept it. Being grateful for the good things in your life can also boost your mood.

Give to others. Volunteering your time to serve others can distract you from your worries and pain, and can give you a sense of purpose and fulfillment that your life matters and that you are contributing to society.

Take time every day to practice spirituality. Daily practice can help you relax and reduce stress, as well as build hope. It may take the form of prayer, saying affirmations, meditating, or doing yoga or deep breathing exercises.



By Tracy Walker, F-NPC
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CAREGIVERS AND CULTIVATING HOPE

*"Hope is the thing with feathers
That perches in the soul,
And sings the tune without the words,
And never stops at all,
And sweetest in the gale is heard."*

—EMILY DICKINSON

It can sometimes be difficult to feel hopeful when dealing with a chronic disease such as MS. Caregivers can help patients find hope, an important part of spiritual practice, by learning to be empathetic (caring) listeners and asking questions that can deepen their bond with the people receiving care, says Rae Lynne Mattis, LCSW, a social worker

in the Atlanta, Georgia area who works with people with chronic illnesses. At the same time, she cautions caregivers against pushing their own feelings and needs on a person with MS.

Questions caregivers can ask people with MS include:

- Are you in pain?
- How may I help you?
- What are you hoping for?

This last question is particularly helpful because it encourages people with MS to think about what they are looking forward to both in the present and the future. It may be attending a life event

(Continued on page 6)

COMMON PROBLEMS THAT CAN COME WITH MS

Multiple sclerosis is the kind of disease that often can lead to other health problems. In this article, we will talk about three of the most common: bone thinning (or osteoporosis), sleep disorders, and obesity.

Bone Thinning

Many people—both men and women—are at risk for thinning bones and the disease known as osteoporosis as they age. However, people with MS may have a greater chance of getting this disease if they are not able to walk or exercise because they are too tired or can't move well, and if they have relapses that require them to take steroids frequently or for long periods of time. Thin, weak bones can lead to breaks, or fractures, which can be painful and worsen your health.

"I suggest that my patients with MS talk to their primary care doctor about getting a bone density test for osteoporosis," says Barbara Bishop, MS, ANP-C, MSCN, CNRN, a nurse practitioner with Virginia Beach Neurology and an *MS Perspectives*' advisor. "It's usually advised for

women over the age of 65 and men over the age of 70, but it may need to be done earlier in people with MS."

To reduce your risk of bone thinning, ask your healthcare team about whether you should be taking calcium and vitamin D supplements. If you have trouble exercising, also ask for a referral to a physical therapist who can design a weight-bearing exercise routine that fits what you are able to do. Weight-bearing exercises include walking, dancing, hiking, playing tennis, and climbing stairs. Other activities like yoga, tai chi, and Pilates can be gentle on the body but very helpful because they can boost your strength and flexibility.

Sleep Disorders

As many as 70% of people with MS may have a sleep disorder. Due to MS symptoms and damage to the brain, and sometimes to medications, MS may cause problems getting to sleep and staying asleep. It is also linked to a serious health disorder called sleep apnea, where a person snores loudly while sleeping and goes for seconds at a time without breathing. This can happen many times

CAREGIVERS AND CULTIVATING HOPE (Continued from page 5)

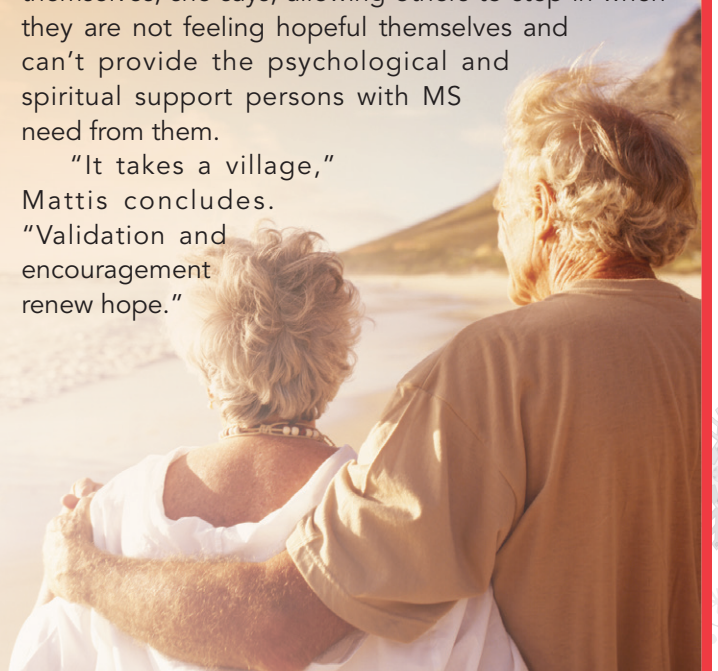
such as a child's wedding or the birth of a grandchild, or a medication that will give them relief from distress or stop the progression of their MS. Questioning along these lines can also reawaken gratitude and purpose for what is present in their lives.

"Hope is not specifically a feeling," says Mattis, "but a state of being. If you are alive, there is an element of hope in your soul. You may not feel connected to it, you may not feel hope loudly, but as long as you are facing challenges and drawing on the support that is being provided to you, you are living in a hopeful way."

Mattis goes on to say that there is also a place for discouragement and loss of faith when confronting a chronic illness—both for people with the disease and caregivers. Opening up and talking about those feelings can deepen a relationship. Caregivers also need to know when to ask for help

themselves, she says, allowing others to step in when they are not feeling hopeful themselves and can't provide the psychological and spiritual support persons with MS need from them.

"It takes a village," Mattis concludes. "Validation and encouragement renew hope."



over the course of a night, interrupting the supply of oxygen to the brain and leaving the person feeling poorly rested.

"I always ask my patients if they have any sleep issues, if they snore, and what their sleep habits are," says Bishop, "so we can treat any MS symptoms that are making it hard to sleep." She continues, "Sleep is so important for our health, and poor sleep or a lack of sleep can worsen MS-related problems like fatigue, balance issues, pain, and the ability to think clearly."

There are many lifestyle changes that can be made to improve your sleep. Follow these tips:

- Go to bed and wake up at the same time each day.
- Don't eat, read, or watch TV in bed—use the bedroom only for sleep and sex.
- Avoid caffeine, nicotine, and alcohol 4 to 6 hours before bedtime.
- Exercise regularly 4 to 6 hours before bedtime to boost your daytime energy and help you sleep better.
- Take a warm bath, do gentle relaxation exercises, read, write in a journal, or color in a coloring book within an hour of bedtime to get ready for sleep.
- Remove all bright lights from your bedroom—such as from a TV or a digital alarm clock—that can disrupt your sleep.

"If I feel that a person may have an underlying sleep disorder, I refer him or her to a sleep specialist for further evaluation and management," says Bishop. "Sleeping better is one way to greatly improve quality of life."

Obesity

Maintaining a healthy weight can help reduce your risk of common diseases that can occur with MS, such as diabetes and high blood pressure. Research also shows that being obese increases the risk for developing MS in the first place, and being overweight can make your MS symptoms more severe. On the other hand, it's known that the steroids that are given to treat MS flare-ups can increase weight, and the tiredness and depression that many people with MS experience can make it difficult for them to get moving to reduce weight.



Unfortunately, because weight gain is a complicated problem, there is rarely a quick fix, says Bishop, especially if a person's weight has been increasing slowly over the years. The best way to approach weight loss is to eat a healthy, portion-controlled diet and exercise as much as you are able to.

"It's more about health than weight, though," she says. That's where MS-customized exercise programs can be helpful. If you can lose even small amounts of weight, you can reduce your blood pressure, cholesterol levels, and glucose (blood sugar). Plus, you'll likely feel better about yourself and have more energy, too.

Support Programs for MS Disease-modifying Therapies (DMTs)

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Avonex[®], Biogen:

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

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Lemtrada[®], Genzyme:

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

Multiple Sclerosis International Federation

www.msif.org

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