Chapter 6  
Common MS Problems and Their Treatment  

**Symptom:** Bladder Problems  

**Description**

Urinary problems frequently occur in the MS population. Some individuals with MS are not aware that bladder dysfunction can be a neurological problem and they don't seek help because they do not know they can be helped. For some people, this problem is so embarrassing that they do not want to discuss it - even with their health care provider. Bladder problems sometimes cause an individual to not leave their home, which leads to social isolation. They also can result in urinary tract infections (UTI's). Decreased sensation, which is common in MS, can mask the symptoms of a UTI. Untreated, UTI's can cause medical complications that pose a risk to a person's general health. Sometimes a person's MS symptoms may worsen during a UTI even though there are no noticeable bladder symptoms.  

Bladder problems in MS may cause an inability to fill the bladder or to empty it. In the bladder that doesn't fill, the cause may be a spastic bladder muscle (detrusor). The symptoms include:

- Urgency (the feeling of having to empty the bladder right now)
- Frequency (voiding more often and in smaller amounts)
- Incontinence (the inability to hold urine in the bladder)

In a bladder that doesn't empty, the cause may be weak bladder muscle contractions, sphincter (circular muscle around the opening) tightness or a loss of coordinated effort of bladder and sphincter. The symptoms include:

- Hesitancy (the inability to empty the bladder on command)
• Frequency
• Urgency
• Occasional incontinence - due to overfilling of the bladder
• Frequent urinary tract infections
• Potential for kidney damage from increased bladder pressure

A full evaluation by an urologist may be necessary. Determining which of the above problems is occurring is important before treatment is initiated.

Treatments

There are a variety of ways to manage and treat bladder problems. A health care provider may recommend some of the following techniques:

• Double voiding to give the bladder more opportunity to empty
• Planned emptying of the bladder to avoid urgency
• Intermittent catheterization to completely drain urine from the bladder
• Attention to fluids to include appropriate types, adequate amounts and timing to fit in your schedule

Medications may be recommended. Medications that may lessen frequency and urgency include:

• Ditropan®
• Detrol™
• Ditropan XL®
• Cystospaz®
• imipramine

Medications that may help to relax the bladder sphincters include:

• Hytrin®
• Cardura®
• Flomax®
• Lioresal®
• Zanaflex™
Symptom: Bowel Problems

Description

Individuals with MS often have problems with constipation and/or urgency and incontinence, but because these manifestations frequently appear in the general population, they are not always recognized as MS symptoms. These problems can be directly related to MS, and once the cause is identified and diagnosed, the symptoms can be treated. People may be reluctant to discuss bowel function, even with their health care providers.

Treatments

Constipation is the most common bowel problem seen in MS and can be caused by several factors. Central nervous system demyelination which is characteristic in MS can cause the normal passage of waste through the bowel to be slowed. Weakness, spasticity, and fatigue can also slow the body's normal functioning. Because of this extended process, more fluid is recycled from the bowel resulting in a drier, harder stool. Restricting fluids because of bladder problems can also cause constipation. Some medications, decreased activity, and depression can cause a change in bowel function.

Constipation can be relieved by dietary modifications such as increasing the amount of fiber and fluids in the diet. Adhering to a bowel program developed with a health care provider can make management easier. Medications are sometimes used in conjunction with these other methods, but it is extremely important to seek the advice of your health care provider before self-treating. Regular use of laxatives is not recommended.

Bowel incontinence is a less common problem. The nervous system can "short-circuit" and without much warning, can cause the bowel to empty even if it isn't full. This symptom is different from diarrhea, which is most often caused by infections or illness. Bowel incontinence can often be treated with dietary modifications and a bowel program; much like
those used to treat constipation. Medications for diarrhea are rarely required on a long-term basis.

**Symptom:** Depression

**Description**

Depression is a commonly reported MS symptom. Signs of depression include increased irritability, a change in appetite accompanied by weight loss or gain, and disturbance of normal sleeping patterns. Other frequently reported symptoms are feelings of worthlessness or hopelessness, poor concentration, decreased energy, and preoccupation with thoughts of death or suicide. People generally recognize that they don’t feel quite “right”, but sometimes the fact that they are depressed is not obvious to them. An individual may not feel especially sad, but other people may notice signs of depression. Additionally, some people with MS experience anxiety, either separate from, or in addition to, depression.

Combinations of the following three factors are believed to cause depression in MS:

Some studies have found that there is a greater incidence of depression in people with MS than in those with other chronic diseases. This suggests that the presence of MS lesions may cause depressive symptoms.

The diagnosis of MS and the emotional impact of exacerbations can be psychologically traumatic for many people. Depression and accompanying symptoms of anxiety, fear, frustration, and anger are normal responses that people have as they struggle to cope with MS.

Depression can be a side effect of some medications used to treat MS symptoms. Steroids, for example, often cause depression. This side effect is also seen in immunomodulating therapies, especially the interferons (Betaseron®, AVONEX® and Rebif®*).

*Rebif® is a form of beta interferon available in Europe and Canada. At press time, it was not yet available in the US.
Depression is a serious symptom that can and should be treated. Depression is not a sign of weakness or self-pity. If a person's depression arises from sense of regret over having MS, there may be a tendency to think that the depression can't be treated because the disease can't be eliminated. It is better to think of untreated depression in much the same way as one would think of an untreated infection, it is very important to address the infection before it creates other problems. Untreated depression can have a significant impact on general physical health and quality of life.

**Treatments**

There are four main treatments that are recommended at the MS Center. A combination of the following approaches is often the most helpful:

Antidepressant medication can help relieve symptoms of depression. Poor concentration, irritability, and sleep and/or appetite disturbances are symptoms that often improve with the appropriate medication. There are several different antidepressants currently available. A physician can prescribe an antidepressant based upon the desired effects as well as the particular symptoms of the patient. There are two important things to remember about antidepressant medications. First, the positive effects of an antidepressant may not be evident for six to ten weeks. Second, if one antidepressant is not effective, a different medication may be more effective. Sometimes several medications may have to be tried before the right one is identified.

Commonly prescribed antidepressant medications include (but are not limited to):

- Prozac®
- Zoloft®
- Paxil®
- Celexa™
- Wellbutrin®
- Luvox®
- Serzone®
• **Effexor®**

While these tend to be the most common type of antidepressants used for people with MS, other types of medications are also used. They include the tri-cyclic antidepressants:

• **Elavil®**
• **Tegretol®**
• **Depakote®**
• **Neurontin®**
• **Pamelor®**

Medications to relieve anxiety include:

• **Buspar®**
• **Xanax®**
• **Valium®**
• **Paxil®**

Counseling can help to clarify the issues as people struggle to come to terms with the real and anticipated losses that accompany a chronic illness. Family and marital counseling can help spouses and family members understand their own feelings and help them cope with the special issues they face. Stress management and biofeedback techniques can help to manage anxiety and other symptoms of stress. Support groups can provide information and empathy from other people who have dealt with MS and can also alleviate the isolation and loneliness that accompany a chronic disease.

**Symptom:** *Dizziness and Vertigo*

**Description**

People with MS sometimes experience bouts of dizziness during an exacerbation (flare-up) or on an ongoing basis. The symptoms can range from light-headedness to sensations of rotational movement (vertigo) where individuals feel as if they or their surroundings are moving around and around. These symptoms may indicate myelin damage in the brainstem area that connects the inner ear and the brain. Vertigo is often also
associated with nystagmus, or jerky eye movements. Episodes last from a few minutes to weeks or months. There may be a single episode or there may be recurring episodes. Dizziness and vertigo may be accompanied by nausea and vomiting as with seasickness. If associated with an exacerbation of MS, these can occur with other symptoms, such as balance trouble, double vision, sensory or motor abnormalities, weakness, or numbness. Dizziness and vertigo can severely impact the ability of a patient to conduct daily activities. It is very important, therefore, to seek early intervention by an MS health care provider at the onset of these symptoms.

**Treatments**

Because dizziness and vertigo can be associated with an exacerbation, the symptoms may be helped by treatment for MS exacerbations. Vertigo may be controlled by medication such as Antivert®. For relief of the nausea that sometimes accompanies these problems, anti-nausea medications can provide some limited relief. Physical therapy may be of benefit is some patients.

**Symptom: Emotional Responses and Mood Swings**

**Description**

Sometimes people with MS have difficulty controlling emotional responses. A mild stimulus can set off a response that far exceeds what the person really feels. For example, people sometimes find themselves crying when they are not feeling especially sad or laughing uncontrollably at something that is only mildly funny. This condition is known as pseudobulbar affect. Some individuals with MS find this problem so embarrassing that they avoid social situations. The lack of emotional control may be the result of an underlying psychological problem such as depression, although people with MS who are not depressed can experience this symptom. Treatment for pseudobulbar affective responses may involve use of antidepressant medications to ease the impact of emotion-arousing events.
Mood swings are often a separate issue and can be caused by the effect of MS lesions on the brain itself. When people with MS experience very strong mood swings, family members and friends are often the first to comment. Some research identifies unexpected outbursts of emotions as the most challenging symptoms of MS from a child’s point of view. Impulsive behaviors (including anger, violence, and inappropriate sexual behaviors) are rare and probably due to lesions in the frontal lobe of the brain. These uncontrolled behaviors can lead to serious problems with relationships and even legal consequences if the behaviors become frequent. Treatment for the behaviors may involve psychological counseling, medication management, and/or close supervision.

**Treatments**

Various antidepressant medications can help to control mood swings. The antidepressant Effexor® may be particularly helpful for this symptom. It is important to remember that symptoms of depression and mood swings can occur simultaneously. In this case, counseling may also be necessary to address the underlying depression. For a list of antidepressant medications, see Depression.

**Symptom: Fatigue**

**Description**

Fatigue is one of the most common symptoms of MS. People experiencing fatigue often complain of limited energy and stamina, and are unable to complete their daily activities.

Difficulty with concentration, thinking, and an overwhelming need to sleep are often reported. Fatigue is an invisible symptom that is often misinterpreted as laziness or a lack of motivation.

If you are experiencing fatigue it is important to determine its cause. Fatigue may be caused by the disease process itself or by:

- Depression
• Sleep disorders
• Diet
• Deconditioning
• Difficulty with arm or leg function
• Other medical problems such as thyroid disorders

Treatments

Medications are often used to treat fatigue but are most effective when coupled with lifestyle modifications. Medications that might be used include:

• Symmetrel®
• Prozac®
• Provigil®

Techniques that simplify routine tasks can extend available energy. Rehabilitation therapists can help people perform daily activities more efficiently, both at home and at work. People with MS often wear themselves out at work and then have no energy to enjoy their home and family time. Work simplification skills can be used to make on-the-job activities more efficient.

Good nutrition, an appropriate exercise regimen, and proficiency at stress management are important in augmenting a limited energy supply. Learning to balance rest with activity and to perform routine tasks in new ways is also important.

Rehabilitation therapists are trained to help people with MS evaluate and learn techniques for managing fatigue.

Occupational therapists teach people to perform the activities of daily living in the most efficient way. They can also do job site evaluations.

Physical therapists help develop an appropriate exercise program.

Biofeedback therapists teach stress management techniques.
Speech/language pathologists teach time management and organizational strategies to improve cognitive functioning.

Nurses/dieticians help develop good nutritional habits.

**Symptom:** Hand Dexterity and Coordination

**Description**

Coordination problems may be experienced as mild shakiness when writing, slowed or difficult handling of objects, or decreased accuracy in a deliberate movement like hitting keys on a keyboard. Many things can adversely affect coordination including weakness, numbness, spasticity (muscle stiffness), tremors and impaired vision. Weakness may prevent prolonged use of the arms and hands, or make it difficult to grasp and lift objects.

**Treatments**

Improving any of the factors affecting coordination may help improve functioning, but often the neurological symptoms that cause poor coordination and weakness cannot be improved. In this case, compensatory techniques can be learned to help people regain the skills needed to perform daily activities. Occupational therapists can determine what is causing the coordination problem and assist in developing alternate methods to accomplish tasks.

Coordination can often be improved by stabilizing the hand or arm to reduce tremors that interfere with movement. Splints can be applied to the wrist to reduce movement at the joint. Techniques for stabilizing the arm against the body or stabilizing one hand with the other can reduce unwanted movement. Weighted utensils, like a pen or spoon, often help reduce mild tremors.

When weakness is a problem that interferes with hand function, large grip utensils or non-slip coatings on an object’s surface are helpful to make the object easier to grip and decrease dropping. Although muscles weakened by the demyelination process of MS cannot be made stronger, exercise can be used
to develop endurance for activity and to strengthen the muscles not affected by MS. Stretching can improve hand and arm movement when spasticity that often accompanies muscle weakness is interfering. Spasticity can also be reduced by use of various medications. (See Stiffness, Spasticity, and Spasms).

**Symptom:**  
*Numbness, Tingling, Burning*

**Description**

The symptoms of numbness and tingling are natural consequences of sensory pathway damage. These sensations known as paresthesias are very common complaints in MS. A particularly strange phenomenon known as "L'hermittes sign" occurs after rapid forward flexion of the neck, after which the patient experiences electric sensations down the spine and into the arms and legs. It is unclear why injury to the sensory pathways can also result in burning sensations, known as dysesthesias, which are especially common in the feet and legs. Heat, overuse, and periods of exacerbation can increase these symptoms, which in some patients are constantly present.

**Treatments**

Burning sensations and other uncomfortable sensations are often treated effectively with medications that are used to treat, pain, depression and/or seizures. No drugs are currently available that seem to have any effect on numbness and tingling.

**Symptom:**  
*Pain*

**Description**

Pain, although formerly dismissed as nonexistent in MS, is actually fairly common and has been shown in some studies to occur in as many as 40% of people with MS. By taking a careful history and physical exam, a physician can help determine the cause of pain. It is helpful to specifically define the cause of pain as either primary (due to the MS lesions and affecting mostly sensory pathways), or secondary (soft tissue or joint pain due to muscle weakness or spasticity).
Because of the number of locations where MS lesions can appear in the brain, it is common for the sensory systems to be affected. The result of sensory involvement can be the loss of sensation in a particular area (patients describe numbness or decreased sensation) or can be heightened sensations that are not based in real or appropriate stimuli (burning or tingling feelings). The most troublesome of these heightened sensations is pain. In addition to the distraction caused by these symptoms, sensory symptoms can affect a person's ability to function. For example, numbness in the feet can impact a person’s ability to feel when their feet hit the ground. This lack of sensation can make walking less steady and confident. Constant tingling in the hands can result in difficulties such as dropping objects or being unable to retrieve items from a pocket or purse. Motor function, which is coordinated largely through sensory input, can be seriously impaired if sensation is impaired. Heat, overuse, and periods of exacerbation can increase these symptoms, which in some patients are constantly present. The treatment of pain deserves more attention than it traditionally gets, since it impacts patients' quality of life, as well as their functional ability.

The causes of secondary pain in MS relate to the consequences of moving the body differently to accommodate the deficits caused by the MS. MS secondary pain affects the muscles, bones, and connective tissue that are injured from overuse and incorrect use over time. Secondary pain may involve the back, shoulders, hips, knees, or other areas. The pain may be described by the patient as a dull aching, intermittent sharp pain, or constant, severe pain. Evaluation, possibly including X-rays or other radiologic tests, is essential to identify the cause and appropriate treatments for secondary pain.

Sometimes people with more advanced MS experience pain due to extremity swelling, or edema. The swelling, which is caused when the muscles don't contract enough to push out the liquids, which gather due to gravity and lack of activity, can cause an aching sensation.

**Treatments**
MS pain is often treated effectively with medications that are used to treat epilepsy and depression. They include:

- Tegretol®
- Klonopin®
- Neurontin®
- Lioresal®
- Dilantin®
- Zanaflex®
- Elavil®
- Pamelor®

There are many possible treatments for secondary pain including physical therapy to strengthen the surrounding area, anti-inflammatory medications, the use of assistive devices or equipment to take the emphasis off the affected area, or even surgery to repair areas of damage. Pain management in these instances may involve a series of trials before it works completely, therefore patience and perseverance is essential.

The treatments for pain caused by swelling include intermittent elevation of the swollen limb, stretching and exercise to force out the water, and diuretic medications if prescribed.

Sometimes pain is of such severity that a pain specialist should be consulted if pain is not responsive to above interventions.

**Symptom:** Pain, Facial

**Description**

Facial pain, also known as trigeminal neuralgia or tic douloureux, appears to be due to plaques that involve portions of the brainstem where the sensory pathways controlling the exquisite sensations of the face and head are located. This causes patients to experience intermittent sharp, jabbing or lightning-like pain in the face. Usually, trigeminal neuralgia radiates to one side of the face. The pain can occur spontaneously or can be brought on by lightly touching the face, by chewing food, or by drinking liquids.
Treatments

Treatment for trigeminal neuralgia can include anti-seizure medications sometimes in combination with a tricyclic antidepressant. These treatments can be effective in over 70% of cases of trigeminal neuralgia. As a last resort, surgery to destroy the affected nerve is sometimes performed in cases where trigeminal neuralgia cannot be controlled with medication.

**Symptom: Pain, Headache**

Description

Patients with MS are susceptible to all the usual causes of headaches; there seems to be no special pattern for those with MS. However, an increased frequency of headaches in people with MS has been noted. The cause of this increased frequency is unknown. The types of headache commonly seen in patients with MS are classic migraine, and common migraine/muscle tension, or rarer forms of headache. It is important to discuss in detail the nature of the headache symptoms with your health care professionals in order to identify the type and appropriate treatment for the headaches.

Treatments

Treatment includes typical over-the-counter medications (based on the needs of the individual). For headaches related to spasticity (cervical muscles can contribute to headache), treatment can include antispasticity medications, massage, heat, or cold. Stress management and biofeedback therapy may also be helpful.

**Symptom: Pain, Joint**

Description

Joint pain occurs for two reasons: over time muscle tightness and spasticity cause the ligaments to shorten and tighten, making it harder to extend the legs, which in turn causes pain, especially in the hips and legs. When muscles don't work
efficiently, there is more wear and tear exerted on the joints. Degenerative arthritis may result from the damage.

**Treatments**

Treatment for joint pain includes rehabilitative interventions to strengthen and stretch the muscles, thus causing less wear and tear in the joints. Nonsteroidal anti-inflammatory medications may also be used. Recently, acupuncture has been found to be effective for some patients.

**Symptom: Seizures**

**Description**

Seizures can occur in 5% of MS patients. Occasionally seizures can be the sign of an MS attack. A seizure occurs as the result of excessive electrical activity from the brain. This is often indicative of an irritation in the brain as a result of the MS process. The MS patient may experience brief intermittent changes in awareness, speech, train of thought, and cognition. The seizure may be focal causing face and arm muscles on one side of the body to contract or spasm uncontrollably. Convulsions or “grand mal seizures” may occur causing a dramatic event in which the patient loses consciousness and convulses. Once seizures are diagnosed, then the person is considered to have epilepsy.

**Treatments**

When a seizure occurs or is suspected, a neurologist needs to assist with the diagnosis and implementation of the appropriate treatment. In each instance, MRI brain scanning is necessary to make sure that the seizure is not caused by another disease such as a tumor or an infection. The MRI can help identify any new and active areas of MS, which could indicate a new attack. An electroencephalogram (EEG) is a special test to identify abnormalities of the brain's electrical activity and can be helpful in locating the area of the seizure's origin. If the seizure is the result of a new MS exacerbation, treatment with steroids will be necessary. In all instances, anti-epilepsy medications will have to be given to control the excess brain electrical activity causing
the seizure. These medications almost always control the seizures and may need to be taken indefinitely. The medications are:

- Dilantin®
- phenobarbitol
- Tegretol®
- Depakote®
- Topamax®
- Keppra®
- clonazepam

The neurologist will decide which medication is best for the type of seizure that occurred.

**Symptom: Sexuality**

**Description**

Sexuality is more than "just sex". It is the embodiment of a person's sexual identity. Sensuality, intimacy, reproduction, and sex are intertwined. Multiple sclerosis can interfere with all aspects of a person's sexuality.

As many as 75% of people with MS may experience periodic sexual dysfunction as a result of MS lesions. The body's primary sex organ is the central nervous system, where all sexual response begins. The short-circuiting of messages to and from the brain, caused by MS lesions, can result in decreased genital sensation, pain, and/or dryness in women. Men may experience decreased sensation and erectile problems. In either gender, fatigue, sensory changes, weakness, spasticity, tremors, bowel and bladder problems, and cognitive problems can also interfere with sexual function. Some medications can change sexual response.

Sexual problems often have a psychological as well as a physical component. MS can contribute to low self-esteem, decreased communication in a relationship, lack of intimacy, and depression and anxiety. All of these can have an impact on sexual functioning. A comprehensive evaluation is often needed to sort out the various issues.
Treatments

An MS health care provider can help determine what is causing sexual problems and make appropriate recommendations. These recommendations generally fall into four categories. Usually a combination of the following is the most helpful:

Treat other underlying causes such as depression, change medications, or adjust hormonal levels.

Medications such as Viagra® are helpful for erectile dysfunction.

Technical management, such as penile injections, vacuum devices or penile implants, is sometimes used for erectile dysfunction. Water-soluble lubricants are beneficial for vaginal dryness.

Compensatory techniques such as timing medications to minimize symptoms or timing intercourse to minimize fatigue.

Counseling for couples and/or individuals to help address the emotional and relationship issues that are interfering with communication, self-esteem, and intimacy.

Symptom: Sleep Disorders

Description

Sleep disorders are common in multiple sclerosis. Poor quality sleep can lead to daytime complaints of malaise, fatigue, muscle aches, weakness, poor memory and cognitive problems. There are many diverse causes of sleep disorders and bringing the problem to the attention of your physician is important. Spending time and effort in determining the cause or contributing factors of poor sleep quality may result in an improvement of the overall quality of life, a decrease in medication use, and a sense of enhanced physical energy and cognitive abilities.
Commonly seen sleep disorders can be classified as difficulty falling asleep (insomnia) or awakening frequently throughout the night (sleep interruptions) secondary to other problems.

Below is a list of common conditions associated with insomnia that can be treated once identified.

**Insomnia**

**Behavioral:**

Poor and irregular sleep habits cause the body's sleep-wake cycle to be poorly regulated.

**Stress, Depression, Anxiety, Panic:**

Poor sleep caused by these symptoms results in an increase of them, setting up a cycle that may need to be broken with treatment.

**Drug dependency:**

Addiction to drugs and/or alcohol is a common risk when insomnia is ongoing. This must be addressed and treated.

**Medications, Fatigue treatments, Caffeine:**

Caffeine and many medications, including those that treat fatigue, stimulate the brain and are notorious for promoting insomnia. Careful consideration of continued use of these substances is warranted.

**Shift work:**

There are known protocols for inducing sleep if the person works irregular hours, and these steps should be implemented.

**Gastric reflux:**

Symptoms of acid or gastric reflux occur when a person lays
down to go to sleep. The epigastric distress will awaken the person thus bringing on insomnia. A health care provider can recommend the appropriate treatment.

Sleep Interruptions

Nocturia: Excessive urination at night results in frequent sleep interruptions. Treatments can include the use of medications to limit bladder overactivity and limiting evening fluid intake. The use of the antidiuretic hormone, DDAVP, can limit how much urine is made at night, thus lessening the frequency of urination.

Spasms / Spasticity: Intense spasms or spasticity can occur during sleep. Medications such as baclofen, Zanaflex™, or clonazepam can alleviate this situation, thus improving comfort and sleep quality.

Restless legs syndrome: This is a common inherited movement disorder among the general population, characterized by excessive leg kicking or “running in bed”. The person's spouse usually complains about being kicked all night and being unable to sleep. The patient usually complains of leg weakness or fatigue in the morning. Medications often used to treat Parkinson's Disease, such as Sinemet®, are extremely successful for this condition.

Obstructive Sleep Apnea: This condition occurs when a person is observed to stop breathing periodically during sleep. When the airway is obstructed to this degree, the individual experiences a loss of oxygen to the brain or other organs. Sharing a room with a snorer can be quite disruptive and results in a multitude of problems, including fatigue. Snoring is a definite sign that a person is at risk for sleep apnea. Treatment is necessary when a person is observed to stop breathing periodically at night. The body's protective systems will awaken the person briefly, causing sleep interruptions. A patient's sleep disturbance may be related to excessive snoring by their spouse. Treatment approaches are best determined by the results of a sleep study and the opinion of a sleep specialist.
In summary, if you have a sleep disturbance impacting your daytime well being it is prudent to “diagnose the cause”, then “treat the cause”.

**Symptom:**  *Speech and Voice Problems*

**Description**

In 25%-40% of people with MS, problems with their speech (dysarthria) and voice (dysphonia) may occur. The muscles that regulate breath control, loudness, resonance, articulation, speech flow, and voice quality can be affected by MS lesions in the brain. Clarity of speech may also be affected by neuromuscular weakness, slowness, and incoordination. The most common MS related speech problems are:

- Slurred speech
- Harsh voice quality
- Impaired loudness
- Impaired emphasis, rate, and flow of speech

**Treatments**

A speech/language pathologist can diagnose and treat speech and voice problems. Techniques to improve or compensate for these problems can be taught. Exercises can improve breath support and strengthen the muscles needed for articulation. In some cases, alternative communication aids or other mechanical devices such as voice amplifiers may be recommended. Medications to reduce spasticity, tremor, and fatigue may also benefit speech and voice problems.

**Symptom:**  *Stiffness, Spasticity and Spasms*

**Description**

It is very common for people with MS to experience “tightness” or stiffness in their muscles. Some people notice this stiffness more in the morning before their muscles warm up. Stiffness may be caused by a decrease in flexibility when activity levels decrease, or it may be due to spasticity, a neurological effect. If one becomes inactive due to extreme fatigue, a sedentary
lifestyle, or pain related to limited movement, stiffness may occur.

MS-related spasticity occurs when there is an injury to the central nervous system. The injury results in abnormal messages being sent to the muscles which creates an increase in “tone” or muscle tightness. Everyone needs some muscle tone to maintain an erect posture and conduct daily activities; spasticity occurs when people have abnormally high tone which may interfere with movement. Generally the legs are more affected by spasticity than the arms or other muscles, and sometimes patients experience one side of their body being more affected than the other. Spasticity is often triggered by rapid movements and can be quite painful. Spasticity can also create difficulties with moving or walking and can contribute to foot drop, where an individual cannot flex the foot sufficiently to clear the toe while walking. Severe untreated spasticity can lead to contractures (restriction of movement in joints), skin breakdown, and pain, and should be treated aggressively. Spasms are strong muscle contractions that tend to be painful, although brief.

**Treatments**

For muscle and joint stiffness and mild spasticity, a physical therapist can design an exercise program to increase flexibility, activity level, and overall fitness. A stretching or range of motion program is also prescribed as an adjunct to medical management and may help to reduce the requirement for medications.

When spasticity and/or spasms cause discomfort or interfere with daily activities, there are several prescription medications available. They include:

- baclofen
- Zanaflex®
- Valium®

For severe spasticity affecting function in a single joint or limb, there are injectable medications, such as botulinum toxin (Botox®) or specific nerve blocks that may help. When
medication options are not enough or if there are side effects preventing increasing doses, surgical implantation of a pump to deliver medication directly to the spinal column may be an option. When there is complete loss of voluntary function (paraplegia) but with presence of spasticity causing chronic pain, joint contractures, and skin breakdown, other surgical procedures are considered.

Symptom: Swallowing

Description

Swallowing difficulty or dysphagia occurs in approximately 30% of the MS population with MS there is the possibility of white matter lesions forming in the areas of the brainstem and cerebellum. Lesions in these areas can create problems with the strength, speed, timing, and coordination of the mouth and throat muscles, which can interfere with safe swallowing. Most often, swallowing problems are mild or temporary and are therefore easily treated. Patients describe various difficulties related to swallowing, such as problems moving the food from the front to the back of the mouth, trouble getting the swallow started, a sensation of food catching in the throat, and choking or coughing while swallowing. It is important to treat swallowing problems to ensure adequate nutrition and hydration and to reduce the risk of aspiration pneumonia (where food or liquid enters the lungs and creates infection).

Treatments

During a swallowing evaluation, a Speech/Language Pathologist asks about particular swallowing difficulties and examines the lips, teeth, tongue, soft palate, and larynx while the patient swallows saliva and various consistencies of food and drink. A Modified Barium Swallow test with both a speech/language pathologist and radiologist present may be ordered to get an x-ray or videofluoroscopy of the swallow mechanism. An individualized treatment program is devised based on the results of the examination and tests. Treatment suggestions may include changing the consistency or temperature of food, instituting an exercise program to strengthen the lips, tongue,
and soft palate, or learning other positioning and safe swallow strategies to employ during eating and drinking.

**Symptom: Thinking, Memory, and Attention**

**Description**

Difficulties with thinking, memory and attention are referred to as cognitive problems, and occur in at least 50% of those with MS. Common difficulties include impairments of attention/concentration and short-term or working memory. People who usually have a good memory may find themselves forgetting appointments or other things they meant to do. They may find it hard to keep track of what they were doing before they were interrupted. For example, if the phone rings while they were sorting mail, some people may have trouble resuming that activity. These difficulties can be very frustrating.

Planning and problem solving may also pose a challenge for those with MS. Individuals can become easily overwhelmed and have trouble coming up with alternate solutions. This may lead others to think of them as being rigid and stubborn.

Sometimes people have trouble organizing and planning even familiar activities. They may be unable to get started even though they know what they want to do. Others may mistakenly think they lack motivation.

Some individuals are unable to stop impulsive behavior. They may be very talkative and unaware of the reactions of others. They may also be less observant of themselves, and therefore have difficulty with changing their behavior. Problems with decision-making may occur as a result of impaired judgement. This happens when people are unable to thoroughly and accurately think through and solve problems on their own.

Emotional problems such as depression or anxiety and physical difficulties such as fatigue may also complicate cognitive symptoms.

**Treatments**

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Cognitive problems often improve with cognitive or language rehabilitation programs. Trained speech/language pathologists, neuropsychologists, and occupation therapists may provide evaluation and treatment of cognitive changes. These specialists can help patients understand the different types of cognitive problems that are experiencing, and then develop strategies to alleviate and/or compensate for them at home, work, or in the community. Techniques to improve attention, memory, information processing, organizing, problem solving, and word finding are typical treatment goals. Family is often included in therapy sessions to improve understanding and application of techniques.

If depression or anxiety are involved, simultaneous treatment with medications and/or psychotherapy may increase the gains made in cognitive rehabilitation. Medications for memory and fatigue may also be beneficial. MS disease-modifying agents are also showing positive trends for slowing the deterioration of specific areas of cognition. Studies are underway regarding the effect of other medications.

**Symptom: Tremors**

**Description**

Tremor occurs in multiple sclerosis when demyelinating lesions affect the brainstem or cerebellum, which contain the control centers for coordinated body movements. Tremor refers to oscillating movements of the limbs or body, which become exaggerated and interfere with function. In multiple sclerosis, tremor is usually low frequency with 3 - 5 oscillations per second. This is referred to as a "cerebellar" type or "intention" tremor. It is characterized by minimal or no tremor at rest, but with marked tremor during sustained posture (e.g. holding the arm outstretched in front of the body or with the hand in front of the face and the arm bent at the elbow), and further worsening of tremor during coordinated action such as reaching for an object or trying to drink a cup of tea. This type of tremor most commonly affects one or both arms, but may also involve the head, voice, and trunk and is almost always accompanied by varying degrees of incoordination. Affected individuals may
have marked difficulty performing everyday tasks requiring fine motor skills including writing, drinking fluids from a cup, using utensils to eat, or dressing.

Occasionally MS patients may have a fine resting tremor called a "familial" or "essential" tremor. This type of tremor is common in the general population and is often seen in different generations of a family. This tremor is not secondary to the demyelinating lesions and tends to respond very well to some medications.

Identifying the type of tremor present is based on a careful history and neurological examination and by the identification from MRI scans of demyelinating lesions in locations known to cause cerebellar tremor.

**Treatments**

Treatment of cerebellar tremor is difficult and most people with cerebellar tremor fail to benefit significantly from drug therapy. Nevertheless, trials of medications are usually warranted if there is significant disability due to the tremor. The most effective medications in patients with tremor due to multiple sclerosis include:

- Symmetrel®
- Zofran®
- Klonipin®
- Tegretol®
- Buspar®

Medical treatments found effective for essential or familial tremor include:

- Inderal®
- Mysoline®

Physical and occupational therapists can design aids to assist with adapting to the problems from tremor. Occasional use of limb weights can help decrease the effects of tremor.

Recently, surgical treatment has been considered for individuals
with significant disability due to tremor. This approach is considered only when maximum acceptable dosages of medications and other physical measures have proven ineffective. This surgery requires specialized surgical techniques and equipment to precisely locate within the thalamus (a deep brain structure) an important motor control relay station that contains nerve cells that fire rhythmically and control the tremor. The traditional operation is thalamotomy, or surgical destruction of this portion of the thalamus. More recently, systems have been developed for placing electrodes in the brain, through which a small electric current is sent, causing the nerve cells to stop functioning thus alleviating the tremor. Frequently, this may restore independence for many activities of daily living in patients who previously were extremely disabled. This is called deep brain stimulation (DBS). DBS requires an evaluation from a highly skilled neurologist and/or neurosurgeon who can discuss the risks and possible benefits of the procedure.

**Symptom:**  Vision

**Description**

Visual involvement is one of the most common complications of MS, especially early in the course of the disease. Vision is one of our most valued senses and it can be very frightening to experience a sudden loss or change in vision. There are four types of visual problems people with MS describe:

*Full or partial loss of vision:* A common occurrence in MS is optic neuritis, or inflammation of the optic nerve. Patients who are diagnosed with optic neuritis may experience complete or partial blindness in one or both eyes, or a change in the way they see colors (colors seem washed out or faded). Optic neuritis episodes sometimes also involve pain in the eye or head.

*Holes in the visual field:* This most commonly occurs in the center of the field of vision. Sometimes colors seem less vivid or clear. This condition is called scotoma. Scotoma occurs as a result of recurrent optic neuritis, where the optic nerve is the focus of the attack and demyelination.
Double Vision: This occurs when the two eyes are not lined up perfectly or not moving together correctly.

Blurred or Distorted Vision: There are two reasons why a person would have problems with keeping their eyes "on track." When the eyes have a tendency to "jump" or bounce, the condition is called nystagmus. When half of the visual field disappears, this is known as visual field defect. These problems are most obvious when reading.

Many patients are very concerned about visual problems and the impact that the problems can make in their lives. Physicians treating people with MS may also become concerned about lasting visual problems and tend to treat visual problems quickly and aggressively. When visual disturbances occur, it is important these problems are discussed with your MS health care provider as soon as possible. The goal of treatment would be to minimize injury to the visual systems and shorten the problem period. Patients who have early attacks involving vision usually recover fully, but repeated attacks may lead to the permanent loss of vision. When threatened with visual loss, aggressive immunologic treatment may be justified for patients experiencing these symptoms.

Treatments

If you are experiencing visual problems, contact your MS health care provider who can screen for MS-related visual problems. In order to describe your visual difficulties to your doctor, try this technique: cover one eye with your hand and look all around. Make note of what you see and how things look. Then cover the other eye and repeat the exercise. Your physician can use these observations to identify the nature of your visual problems and plan appropriate treatments.

Optic neuritis and scotoma are often treated as exacerbations and treated accordingly. Immunologic therapies may be considered to minimize the recurrence of vision problems. Symptomatic therapies and interventions, particularly occupational therapy, may be prescribed to treat double vision, nystagmus, and visual field defect. In an occupational therapy
setting, strategies can be learned to help individuals compensate for visual problems.

**Symptom:**  *Walking Problems*

**Description**

Difficulties with walking are common MS symptoms. People often report their legs feel weak. Muscle stiffness (spasticity), poor balance (visual disturbances), and sensory disturbances, such as numbness, can contribute to walking problems. Fatigue can increase problems with balance, lower extremity weakness, stiffness, and numbness, which make it harder to walk safely and efficiently.

Toe drag or foot drop is a common problem in MS and occurs when one can't lift a foot quite high enough, thus catching their toe on the ground and losing their balance, which can result in a fall. People sometimes compensate for foot drop by swinging the hip to the side, bending the knee, or tilting the body in order to keep the foot from dragging on the ground. These compensations cause an abnormal walking pattern, which can lead to lower extremity or low back pain (and fatigue).

**Treatments**

Physical therapists help people determine why they are having trouble walking. A physical therapist will analyze individual gait patterns (how a person walks) and test muscle strength, balance, and sensation to determine specific problems. Based on this evaluation, the physical therapist will recommend a program to address these problems. Recommendations usually fall into five general areas:

A comprehensive physical therapy program can increase muscle strength, endurance, flexibility, balance, and coordination. Programs are tailored to the ability and fitness level of the individual and can be as varied as rigorous fitness programs, hydrotherapy, and wheel chair aerobics.

Assistive aids, such as a cane or brace, may be prescribed to improve balance and conserve energy while walking.
Energy conservation techniques can help reduce fatigue and can improve endurance.

Practical solutions, such as a different shoe type, home layout, or walking surface may also be suggested to help improve gait.

Medications are sometimes recommended to help decrease spasticity (muscle stiffness). (See Stiffness, Spasticity and Spasms).

**Symptom:** Weakness

**Description**

Weakness is a significant problem for some people with MS. The most common symptom is extremity weakness (in the arms and/or legs) but trunk weakness is a problem which can be overlooked by many people. Weakness may be due to neurological causes but can also be a symptom of inactivity. A physical therapy evaluation can be done to identify the cause and determine the appropriate course of treatment. Research focusing on exercise for people with MS, specifically strengthening exercise, is increasing. Physical therapists are now being more specific in their approach to strengthening individuals with MS in order to avoid increased fatigue.

**Treatments**

Physical therapists evaluate extremity and trunk strength through a series of tests. Based on these evaluations an individualized strengthening program can be designed to address weakness problems. Many exercise programs are designed to be carried out at home, while some programs require ongoing supervision.