

## JANUARY - FEBRUARY 2009

### Wellness Mondays for Employees

- January 5, 12 & 26, 9 a.m.-3 p.m.
- February 2, 9, 16 & 23, 9 a.m.-3 p.m.
- 320 Bayer Learning Center

### Wellness Wednesdays for Students

- January 14 & 28, 1-3 p.m.
- February 11 & 25, 1-3 p.m.
- 320 Bayer Learning Center

### Wellness Mondays/Wednesdays

To schedule an appointment, please call x5874.

### Blood Pressure Screening

- January 14 & 28, 10 a.m.-noon
- February 11 & 25, 10 a.m.-noon
- 3<sup>rd</sup> Floor, Duquesne Union
- No appointment necessary



**FLU SHOTS** available \$25

### COMING SOON!

Expanded screenings for the following conditions:  
 Anemia, Urinary Tract Infections and more.

### CENTER FOR PHARMACY CARE SERVICES

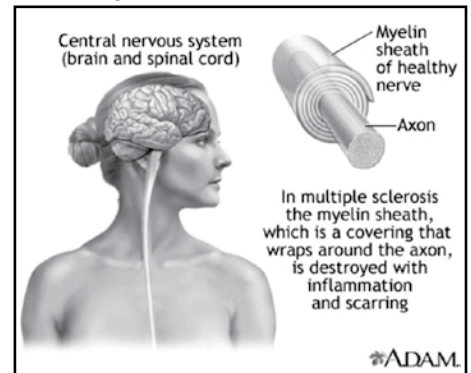
The Center offers the following complimentary screenings and services:

- Bone density
- Body composition analysis
- Facial skin analysis
- Serum glucose and A1C testing for diabetes & Living My Life®
- Cholesterol screening
- Tobacco Cessation Program
- Health Care Coaching
- Medication Therapy Management

## MULTIPLE SCLEROSIS: A Disease with Many Faces

The earliest known description of multiple sclerosis (MS) occurred in Holland in the 14<sup>th</sup> century. It was initially recognized and diagnosed in 1849. MS is an unpredictable, autoimmune disease affecting the central nervous system (CNS) that includes the brain and spinal cord. It is characterized by inflammation and damage to the myelin sheath (covering) that insulates nerve fibers (axons) within the nervous system (see Figure 1). Myelin, composed of lipids (fats) and protein, is critical to the electrical conduction of nerve signals. MS produces scarring and hardening (sclerosis) of the myelin sheath that impairs nerve signaling and results in symptoms of the disease (see Table 1).

**Figure 1: Central Nervous System: Anatomy of Nerve Fiber**



From: New York Times

<http://www.nytimes.com/imagepages/2007/08/01/health/adam/17089Multiplesclerosis.html>  
 (9 December 2008)

**Table 1: Signs and Symptoms of Multiple Sclerosis**

MOST COMMON
Fatigue
Numbness
Walking, balance & coordination problems
Bladder or bowel dysfunction
Visual disturbances
Dizziness and vertigo
Sexual dysfunction
Pain
Reduced cognitive function
Emotional changes/depression
Spasticity
LESS COMMON
Speech disorders
Swallowing difficulties
Headache
Hearing loss
Seizures
Tremor
Respiratory/breathing problems
Itching

It is estimated that 1 in 700 Americans is afflicted with the disorder. MS primarily affects adults between the ages of 20 and 50 years and is more common in women than men. The majority of patients are mildly affected, but, in severe cases, MS can render a person unable to write, speak or walk. In some patients, MS symptoms may be dormant for years, but, in others, the condition can deteriorate rapidly. Various terms such as *relapsing-remitting*, *secondary progressive* and *primary progressive* have been used to describe the clinical patterns of MS and it is important to understand the variable degrees of disease activity in this condition.

### WHAT CAUSES MULTIPLE SCLEROSIS?

While the specific cause of MS is still unknown, scientists believe the disease may be related to a combination of immunologic, environmental, infectious and genetic factors. MS appears to involve an *autoimmune* process (an abnormal response of the patient's immune system against his/her own tissue) directed against myelin. Geographically, MS is known to occur more frequently in areas that are farther from the equator. Northern Europe and the northern United States have the highest prevalence of patients with MS. Studies of migration patterns indicate that if people are born in an area of the world with a high risk of MS and move before

The destructive process primarily occurs in areas of the brain containing myelinated fibers (*white matter*). It may also extend into the cortex, a more central area comprised of nerve cell bodies (*gray matter*).

*continued on back*

# MULTIPLE SCLEROSIS: A Disease with Many Faces

the age of 15 to a lower risk area, their chance for developing the condition is decreased. People who live closer to the equator are exposed to greater amounts of sunlight year-round. As a result, they tend to have higher levels of vitamin D. This vitamin is thought to have a beneficial effect on immune function and may be protective against autoimmune diseases like MS.

Viruses are well recognized causes of demyelination and inflammation as seen in MS. It is possible that a virus or other infectious agent is the triggering factor in this disease. More than a dozen viruses and bacteria have been investigated as possible causes of the condition. Finally, while MS is not hereditary in a strict sense, having a first-degree relative (parent or sibling) with MS increases an individual's risk of developing the disease several-fold.

## DIAGNOSIS

A variety of methods may be used to evaluate the signs and symptoms of MS. While no single test is specific, the condition may be diagnosed by a review of signs and symptoms, exclusion of other conditions and appropriate use of newer technologies.

- **Medical History and Neurologic Exam** are used to identify any past or present symptoms that might be caused by MS and to gather information regarding family and travel history. Other tests must be conducted to evaluate speech patterns, movement and coordination, balance, vision, etc.
- **Magnetic Resonance Imaging (MRI)** is considered the best technology for detecting the presence of MS plaques (also called lesions) in the CNS. It can differentiate old lesions from those that are new or active. The diagnosis of MS cannot

be made solely on the basis of MRI because other diseases can produce lesions similar to those of MS. It must be recognized that a normal MRI does not rule out the possibility of MS.

- **Visual Evoked Potential (VEP)** tests are recordings of the nervous system's electrical response to the stimulation of specific sensory pathways. They can occasionally provide evidence of scarring that is not evident during neurologic exam. VEPs are considered by some as the most useful tool for confirming a diagnosis of MS.
- **Cerebrospinal Fluid Analysis** may detect the presence of certain immune system proteins that are found in the spinal fluid of 90-95% of people with MS.

## TREATMENT

Some medications can reduce disease activity and progression for many individuals with relapsing forms of MS. *Table 2* lists *disease-modifying* treatments that have been effective in suppressing or altering the activity of the body's immune system. Unfortunately, they must be administered by injection and each can produce serious adverse effects. Interferons, natural proteins that play a major role in immune function, are frequently used in the initial management of patients with MS. They routinely produce flu-like symptoms; however, serious complications such as blood disorders, seizures and liver disease have been reported. The other drugs in this category may be required if interferons are ineffective.

Additional medications may be required to control the multiple symptoms of MS. For example, baclofen may be quite useful

in reducing spasticity while drugs such as tolterodine (Detrol) and darifenacin (Enblex) are beneficial for urinary problems.

- **Exacerbations:** An exacerbation or worsening of MS is caused by renewed inflammation in the central nervous system (CNS) that damages myelin and interferes with nerve transmission. Exacerbations last from days to several weeks or even months. They can be mild or sufficiently serious to interfere with a person's ability to function. Severe exacerbations are commonly treated with short bursts of high-dose corticosteroids.
- **Managing Symptoms:** Symptoms of MS are highly variable. Medication, self-care techniques, rehabilitation and the use of assistive devices are frequently necessary for controlling the various complications of MS.
- **Rehabilitation for Function:** Rehabilitation is designed to help patients with MS effectively and safely perform tasks at home and work. It includes physical, occupational and speech therapy as well as cognitive and vocational activities.
- **Complementary and Alternative Medicine (CAM):** Exercise and diet, food supplements, stress management strategies and lifestyle changes are all examples of CAM that may benefit patients with MS.

Multiple sclerosis is potentially a debilitating disease that can affect almost all body functions. Its affect on younger adults is particularly devastating. Early diagnosis is critical to improve patient outcomes and their quality of life. Additional treatments must be identified to better manage this disease.

**Table 2: Disease-Modifying Treatments for Multiple Sclerosis**

DRUG NAME Generic (Brand)	ROUTE	ADVERSE DRUG REACTIONS (not a complete list)
INF beta-1a (Avonex)	IM	Flu-like symptoms, muscle tightness, weakness, tingling or numbness of skin and depression
INF beta-1b (Betaseron)	SQ	Weakness, flu-like symptoms, headache, pain, depression and suicidal ideation
INF beta-1a (Rebif)	SQ	Flu-like symptoms, muscle tightness, weakness, tingling or numbness of skin and depression
glatiramer acetate (Copaxone)	SQ	Chest pain, weakness, infection, nausea, joint pain, anxiety and muscle tightness
mitoxantrone (Novantrone)	IV	Heart failure, nausea, hair loss, urinary infection and menstrual disorders
natalizumab (Tysabri)	IV	Headache, fatigue and rare brain disorders

INF = interferon IM = intramuscular SQ = subcutaneous IV = intravenous



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For more information: • [www.nlm.nih.gov/medlineplus/multiplesclerosis.html](http://www.nlm.nih.gov/medlineplus/multiplesclerosis.html)  
• <http://www.nationalmssociety.org/index.aspx>  
• <http://www.msfacts.org>

[www.pharmacy.duq.edu](http://www.pharmacy.duq.edu)