Alzheimer Society

Multiple sclerosis

Multiple sclerosis (MS) is an immune-mediated disease that causes the body's immune system to mistakenly attack myelin in the central nervous system. Myelin allows the transmission of nerve impulses to and from the brain and spinal cord, making it easy for the brain to communicate with different parts of the body. When myelin or nerve fibres are damaged or destroyed, communication between the brain, spinal cord and other parts of the body is broken. MS may also cause atrophy (cell loss) of the grey matter in the brain. Depending on where the damage in the brain is, MS can affect different aspects of a person's physical, emotional and cognitive functioning.

There are four types of MS

- **Relapsing-remitting MS.** Most people living with MS have this type. It is characterized by unpredictable but clearly defined periods during which new symptoms appear or existing ones get worse (relapses). These relapses can last from a few days to several months and are followed by periods of recovery (remission) during which many functions return.
- **Secondary progressive MS.** Most people with relapsing-remitting MS transition to this type, in which there are occasional relapses and a gradual increase of disability progression.
- **Primary progressive MS.** This is characterized by slow progression of disability without defined relapses or periods of remission.
- **Clinically isolated syndrome.** This is when a person experiences a single episode of neurological symptoms suggestive of MS. Though clinically isolated syndrome can lead to a diagnosis of MS, not everyone who experiences clinically isolated syndrome will go on to develop MS.

About half of all people living with MS experience cognitive changes. A small number of these individuals with severe symptoms will develop dementia.

The most common symptoms include a decline in **episodic memory** (ability to recall specific events, situations or experiences) and slowed cognitive **processing speed** (quickness of taking in information, making sense of it and beginning to respond). Other cognitive changes may include difficulties with:

- Learning new information
- Short-term memory
- Problem solving
- Planning and carrying out an activity

Most often the cognitive changes are mild, and the person can function well either independently or with minimal accommodations and support.

There are 2.8 million people living with MS worldwide. Canada has one of the highest rates of MS in the world, with over 90,000 Canadians living with MS.

- MS is the most common neurological disease affecting young adults. In Canada, the average age at MS diagnosis is 43.
- Women are three times more likely to be diagnosed with relapsing-remitting MS than men. However, the number of women and men affected by primary progressive MS is similar.

People living with MS may experience a wide range of symptoms.

Symptoms of MS may include:

- Vision problems
- Limb weakness
- Poor balance
- Difficulty walking
- Mood changes such as depression and anxiety
- Pain
- Numbness
- Tremors
- Bladder and/or bowel dysfunction
- Fatigue

Diagnosing MS can be challenging, as there is no single test or assessment.

To ensure an accurate diagnosis of MS, a neurologist will assess the following:

- Evidence of disease activity separated by time (lesions that formed at different points in time) and space (lesions in at least two separate areas of the central nervous system).
- Patterns and types of symptoms, medical history and a neurological examination.
- Damage or lesions in the brain and spinal cord that can be seen by magnetic resonance imaging (MRI).
- The presence of oligoclonal band proteins in cerebrospinal fluid using a spinal tap (lumbar puncture). A spinal tap can also help rule out other conditions.
- Myelin damage in the central nervous system and slowed electrical nerve response to stimuli; tested by an evoked potential (EP) test.

Multiple factors can contribute to developing MS.

- **Lifestyle:** Cigarette smoking and adolescent obesity increase the risk of developing MS.
- **Environmental:** Lack of vitamin D is a risk factor for people living with MS. As a major source of vitamin D is exposure to sunlight, individuals living in countries far away from the equator (such as Canada) can have more vitamin D deficiency.
- **Genetic:** Changes in human leukocyte antigen (HLA) genes have been linked to increased MS risk. The *HLA-DRB1*1501* variation has the strongest associated genetic change related to MS development. The HLA complex helps the immune system respond to viruses and bacteria.
- **Infectious:** Epstein-Barr virus and human herpes virus 6-A have been found to increase the risk of getting MS.

There are treatments available to manage the progression and symptoms of MS.

- **Disease-modifying therapies** are medications used to help slow the progression of MS, reduce relapses and slow deterioration. These medications are more efficient in relapsing-remitting MS than in other forms of MS.
- **Physical therapy and rehabilitation** can help maintain or improve physical abilities.
- **A healthy lifestyle**, including eating a balanced diet, exercising and managing stress.
- **Cognitive rehabilitation** can also be of some benefit in managing the cognitive challenges of MS.

Support is available.

Contact your local Alzheimer Society for more information about dementia.

Visit alzheimer.ca/helpnearyou

Additional resources.

Contact the MS Society for more information about multiple sclerosis. Visit mssociety.ca

Visit brainxchange.ca to find webinars on multiple sclerosis.

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To provide feedback on this factsheet, please email publications@alzheimer.ca

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