

GLOSSARY

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Americans with Disabilities Act (ADA)

The first comprehensive legislation to prohibit discrimination on the basis of disability. The ADA (passed in 1990) guarantees full participation in society to people with disabilities. The four areas of social activity covered by the ADA are employment; public services and accommodations; transportation; and communications (e.g., telephone services).

Autoimmune disease

A process in which the body's immune system causes illness by mistakenly attacking healthy cells, organs or tissues in the body that are essential for good health. In multiple sclerosis, the specific antigen — or target — that the immune cells are sensitized to attack remains unknown, which is why MS is considered by many experts to be “immune-mediated” rather than “autoimmune.”

Axon

The extension or prolongation of a nerve cell (neuron) that conducts impulses to other nerve cells or muscles.

Axonal damage

Injury to the axon (**see Axon**) in the nervous system. In addition to damaging the myelin coating around nerve fibers, MS is known to damage or even sever the underlying nerve fibers as well. This irreversible damage can occur at any point in the disease, even during the earliest phases.

Blood-brain barrier

A semi-permeable cell layer around blood vessels in the brain and spinal cord that prevents large molecules, immune cells, and potentially damaging substances and disease-causing organisms (e.g., viruses) from passing out of the blood stream into the central nervous system (brain, spinal cord and optic nerves). A break in the blood-brain barrier may underlie the disease process in MS.

Central nervous system

The part of the nervous system that includes the brain, optic nerves, and spinal cord.

Cerebrospinal fluid (CSF)

A watery, colorless, clear fluid that bathes and protects the brain and spinal cord. The composition of this fluid can be altered by a variety of diseases. Certain changes in CSF that are characteristic of MS can be detected with a lumbar puncture (spinal tap), a test sometimes used to help make the MS diagnosis. **See Lumbar puncture.**

Chronic

Of long duration, not acute; a term often used to describe a disease that shows gradual worsening.

Clinically isolated syndrome (CIS)

A first neurologic event that is suggestive of demyelination,

accompanied by multiple, clinically 'silent' (asymptomatic) lesions on MRI that are typical of MS. Individuals with this syndrome are at high risk for developing clinically definite MS.

Clinical trial

Rigorously controlled study designed to provide extensive data that allow for statistically valid evaluation of the safety and efficacy of a particular treatment. **See also Double-blind clinical study; Placebo.**

Cognition

High level functions carried out by the human brain, including comprehension and use of speech, visual perception and construction, calculation ability, attention (information processing), memory, and executive functions such as planning, problem-solving and self-monitoring.

Cognitive impairment

Changes in cognitive function caused by trauma or disease process. Some degree of cognitive impairment occurs in approximately 50 to 60 percent of people with MS, with memory, information processing, and executive functions being the most commonly affected functions. **See Cognition.**

Cognitive remediation (also called cognitive rehabilitation)

Techniques designed to improve the functioning of individuals whose cognition is impaired because

of physical trauma or disease.

Rehabilitation strategies are designed to improve the impaired function via repetitive drills or practice, or to compensate for impaired functions that are not likely to improve.

Cognitive rehabilitation is provided by psychologists and neuropsychologists, speech/language pathologists, and occupational therapists. While these specialists use different assessment tools and treatment strategies, they share the common goal of improving the individual's ability to function as independently and safely as possible in the home and work environment. **See Neuropsychologist; Occupational therapist; Speech/language pathologist.**

Controlled study

See Placebo-controlled clinical trial.

Corticosteroid

Any of the natural or synthetic hormones associated with the adrenal cortex (which influences or controls many body processes). Corticosteroids include glucocorticoids, which have an anti-inflammatory and immunosuppressive role in the treatment of MS relapses. **See also Glucocorticoids.**

Demyelination

A loss of myelin in the white matter of the central nervous system (brain, spinal cord).

Disability

As defined by the World Health Organization, a disability (resulting from a physical or mental impairment) is a restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human being.

Disease course (also referred to as disease types)

There are four basic disease courses in MS:

- **Clinically isolated syndrome** is a first episode of neurologic symptoms caused by inflammation and demyelination in the central nervous system. A person who experiences clinically isolated syndrome may or may not go on to develop MS, with the chances being higher in someone who has lesions on MRI that are similar to those seen in MS.
- **Relapsing-remitting MS** is characterized by clearly defined relapses (also called attacks or exacerbations) that last from days to weeks and then subside, with full or partial recovery and no apparent disease progression between attacks. Approximately 85 percent of people begin with this disease course.
- **Primary progressive MS** is characterized by a gradual but steady progression of disability from the onset of symptoms, with no relapses or remissions.

Occasional plateaus and minor, temporary improvements may occur. Approximately 15 percent of people are diagnosed with this disease course.

- **Secondary progressive MS** begins initially with a relapsing-remitting course that later evolves into a more consistently progressive course, with or without relapses.

Double-blind

Refers to a clinical trial in which none of the participants, including experimental subjects, examining doctors, attending nurses, or any other research staff, know who is taking the test agent and who is taking a control or placebo agent. The purpose of this research design is to avoid unintentional bias of the test results. In all studies, procedures are designed to 'break the blind' if medical circumstances require it. **See Placebo; Placebo-controlled clinical trial.**

Evoked potentials (EPs)

EPs are recordings of the nervous system's electrical response to the stimulation of specific sensory pathways (e.g., visual, auditory, general sensory). In tests of evoked potentials, a person's recorded responses are displayed on an oscilloscope and analyzed on a computer that allows comparison with normal response times. Demyelination results in a slowing of response time. EPs can demonstrate lesions along specific nerve pathways whether or not the lesions are producing symptoms, thus making this

test useful in confirming the diagnosis of MS. Visual evoked potentials are considered the most useful in MS. **See Visual evoked potential.**

Exacerbation

See Relapse.

Failure to empty (bladder)

A type of bladder dysfunction in MS resulting from demyelination in the voiding reflex center of the spinal cord. The bladder tends to overfill and become flaccid, resulting in symptoms of urinary urgency, hesitancy, dribbling and incontinence.

Failure to store (bladder)

A type of bladder dysfunction in MS resulting from demyelination of the pathways between the spinal cord and brain. Typically seen in a small, spastic bladder, storage failure can cause symptoms of urinary urgency, frequency, incontinence and nocturia (getting up frequently at night to urinate).

FDA

See U.S. Food and Drug Administration (FDA).

Gadolinium

A chemical compound that can be administered to a person during magnetic resonance imaging to help distinguish between new lesions and old lesions. The gadolinium causes new or active lesions to appear very bright.

Gadolinium-enhancing lesion

A lesion appearing on magnetic resonance imagery, following injection of the chemical compound gadolinium, that reveals a breakdown in the blood-brain barrier. This breakdown of the blood-brain barrier indicates either a newly active lesion or the re-activation of an old one. **See Gadolinium.**

Glucocorticoid hormones

Steroid hormones that are produced by the adrenal glands in response to stimulation by adrenocorticotrophic hormone (ACTH) from the pituitary. These hormones, which can also be manufactured synthetically (prednisone, prednisolone, methylprednisolone, betamethasone, dexamethasone), serve both an immunosuppressive and an anti-inflammatory role in the treatment of MS exacerbations: they damage or destroy certain types of T-lymphocytes that are involved in the overactive immune response, and interfere with the release of certain inflammation-producing enzymes.

Immune system

A complex network of glands, tissues, circulating cells, and processes that protect the body by identifying abnormal or foreign substances and neutralizing them.

Immune-mediated disease

A disease in which components of the immune system — t-cells, antibodies,

and others — are responsible for the disease either directly (as occurs in autoimmunity) or indirectly (for example, when damage to the body occurs secondary to an immune assault on a foreign antigen such as a bacteria or virus).

Information processing

One of the cognitive functions that can be affected in MS. The ability to take in and respond to incoming stimuli from the environment (through vision, hearing, touch, taste, etc.) may be slowed in people with MS.

Infusion

The process by which some medications are delivered directly into a vein. The medication, which is contained in a plastic bag suspended on a pole, is forced by gravity to travel down a tube and through a needle inserted in the vein (usually in the arm).

Job accommodations

Under the Americans with Disabilities Act (ADA), an employment-related change that an employer is required to make in order to ensure equal opportunity for a person with a disability. Job accommodations for people with MS might include: a modified work schedule, provision of specialized equipment, renovation of doorways or bathrooms to accommodate a person in a motorized scooter.

Lassitude

A term that is used for the type of fatigue that seems to be unique to MS, often described as an overwhelming tiredness that seems unrelated to activity level or time of day. Lassitude is thought to result from demyelination in the central nervous system.

Lesion

An area of inflamed or demyelinated central nervous system tissue (also called a plaque). **See Gadolinium; Gadolinium-enhancing lesion.**

Long-term disability policy

A private or employer-based, income-protection insurance that replaces a percentage of income lost once a person becomes too disabled to work at his or her job. While three months is a common waiting period, the requirements vary from policy to policy. Benefits generally continue to age 65. **See Short-term disability policy.**

Lumbar puncture

A diagnostic procedure that uses a hollow needle (canula) to penetrate the spinal canal at the level of third/fourth or fourth/fifth lumbar vertebrae to remove cerebrospinal fluid for analysis. This procedure is used to examine the cerebrospinal fluid for changes in composition that are characteristic of MS (e.g., elevated white cell count, elevated protein content, the presence of oligoclonal bands).

Lymphocyte

A type of white blood cell that is part of the immune system. Lymphocytes can be subdivided into two main groups: B-lymphocytes, which originate in the bone marrow and produce antibodies; T-lymphocytes, which are produced in the bone marrow and mature in the thymus. Helper T-lymphocytes heighten the production of antibodies by B-lymphocytes; suppressor T-lymphocytes suppress B-lymphocyte activity and seem to be in short supply during an MS exacerbation.

Magnetic resonance imaging (MRI)

A diagnostic procedure that produces visual images of different body parts without the use of X-rays. Nuclei of atoms are influenced by a high frequency electromagnetic impulse inside a strong magnetic field. The nuclei then give off resonating signals that can produce pictures of parts of the body. An important diagnostic tool in MS, MRI makes it possible to visualize and count lesions in the white matter of the brain and spinal cord.

MRI

See **Magnetic resonance imaging**.

Myelin

A soft, white coating of nerve fibers in the **central nervous system**, composed of lipids (fats) and protein. Myelin serves as insulation and as an aid to efficient nerve fiber conduction. When myelin is damaged in MS,

nerve fiber conduction is faulty or absent. Impaired bodily functions or altered sensations associated with those demyelinated nerve fibers are identified as symptoms of MS in various parts of the body.

Nerve

A bundle of nerve fibers (axons). The fibers are either afferent (leading toward the brain and serving in the perception of sensory stimuli of the skin, joints, muscles, and inner organs) or efferent (leading away from the brain and mediating contractions of muscles or organs).

Nervous system

Includes all of the neural structures in the body: the central nervous system consists of the brain, spinal cord and optic nerves; the peripheral nervous system consists of the nerve roots, nerve plexi and nerves throughout the body.

Neurologist

Physician who specializes in the diagnosis and treatment of conditions related to the nervous system.

Neurology

Study of the central, peripheral and autonomic nervous systems.

Neuron

The basic nerve cell of the nervous system. A neuron consists of a nucleus within a cell body and one or

more processes (extensions) called dendrites and axons.

Neuropsychologist

A psychologist with specialized training in the evaluation of cognitive functions. Neuropsychologists use a battery of standardized tests to assess specific cognitive functions and identify areas of cognitive impairment. They also provide remediation for individuals with MS-related cognitive impairment. **See Cognition; Cognitive impairment.**

Occupational therapist (OT)

Occupational therapists assess functioning in activities of everyday living, including dressing, bathing, grooming, meal preparation, writing and driving, which are essential for independent living. In making treatment recommendations, the OT addresses 1) fatigue management, 2) upper body strength, movement and coordination, 3) adaptations to the home and work environment, including both structural changes and specialized equipment for particular activities, and 4) compensatory strategies for impairments in thinking, sensation or vision.

Oligoclonal bands

A diagnostic sign indicating abnormal levels of certain antibodies in the cerebrospinal fluid; seen in approximately 90 percent of people with MS, but not limited to MS.

Oligodendrocyte

A type of cell in the central nervous system that is responsible for making and supporting myelin.

Optic neuritis

Inflammation or demyelination of the optic (visual) nerve with transient or permanent impairment of vision and occasionally pain.

Physiatrist

Physicians who specialize in physical medicine and rehabilitation, including the diagnosis and management of musculoskeletal injuries and pain syndromes, electro-diagnostic medicine (e.g., electromyography), and rehabilitation of severe impairments, including those caused by neurologic disease or injury.

Physical therapist (PT)

Physical therapists are trained to evaluate and improve movement and function of the body, with particular attention to physical mobility, balance, posture, fatigue and pain. The physical therapy program typically involves 1) educating the person with MS about the physical problems caused by the disease, 2) designing an individualized exercise program to address the problems, and 3) enhancing mobility and energy conservation through the use of a variety of mobility aids and adaptive equipment.

Placebo

An inactive, non-drug compound that is designed to look just like the test agent. It is administered to control group subjects in double-blind clinical trials (in which neither the researchers nor the subjects know who is getting the treatment and who is getting the placebo) as a means of assessing the benefits and liabilities of the test treatment taken by experimental group subjects.

Placebo-controlled clinical trial

A clinical trial that compares the outcome of a group of randomly-assigned patients who receive the experimental treatment to the outcome of a group of randomly-assigned patients who receive an inactive placebo. For an experimental treatment to be shown effective, the group receiving the treatment must do significantly better, over a pre-determined period of time, than the group receiving the placebo.

Primary-progressive MS

See Disease course.

Pseudo-exacerbation

A temporary aggravation of disease symptoms, resulting from an elevation in body temperature or other stressor (e.g., an infection, severe fatigue, constipation), that disappears once the stressor is removed. A pseudo-exacerbation involves symptom flare-up rather than new disease activity or progression.

Rehabilitation

Rehabilitation in MS involves the intermittent or ongoing use of multidisciplinary strategies (e.g., physiatry, physical therapy, occupational therapy, speech therapy) to promote functional independence, prevent unnecessary complications, and enhance overall quality of life. It is an active process directed toward helping the person recover and/or maintain the highest possible level of functioning and realize his or her optimal physical, mental and social potential given any limitations that exist. Rehabilitation is also an interactive, ongoing process of education and enablement in which people with MS and their care partners are active participants rather than passive recipients.

Relapse

The appearance of new symptoms or the aggravation of old ones, lasting at least 24 hours (synonymous with attack, exacerbation, flare-up or worsening); usually associated with inflammation and demyelination in the brain or spinal cord.

Relapsing-remitting MS

See Disease course.

Remission

A lessening in the severity of symptoms or their temporary disappearance during the course of the illness.

Sclerosis

Hardening of tissue or scarring that occurs in areas where the myelin coating around nerve fibers in the central nervous system is damaged or destroyed.

Secondary-progressive MS

See Disease course.

Sensory

Related to bodily sensations such as pain, smell, taste, temperature, vision, hearing, acceleration, and position in space.

Short-term disability policy

An employer-based income-protection insurance that replaces a percentage of income lost during a brief illness or period of disability. **See Long-term disability policy.**

Sign

An objective physical problem or abnormality identified by the physician during the neurologic examination. Neurologic signs may differ significantly from the symptoms reported by the patient because they are identifiable only with specific tests and may cause no overt symptoms. Common neurologic signs in MS include altered eye movements and other changes in the appearance or function of the visual system; altered reflexes; weakness; spasticity; circumscribed sensory changes.

Spasticity

A common symptom of MS that can include feelings of stiffness and a wide range of involuntary muscle spasms (sustained muscle contractions or sudden movements). Spasticity may be as mild as the feeling of tightness of muscles or may be so severe as to produce painful uncontrollable spasms of extremities, usually of the legs. It may also produce feelings of pain or tightness in and around joints, and cause low back pain.

Speech/language pathologist

Speech/language pathologists specialize in the diagnosis and treatment of speech and swallowing disorders. Because of their expertise with speech and language difficulties, these specialists also provide cognitive remediation for individuals with cognitive impairment.

Spinal tap

See Lumbar puncture.

Symptom

A subjectively perceived problem or complaint reported by the patient. In MS, common symptoms include visual problems, fatigue, sensory changes, weakness or paralysis of limbs, tremor, lack of coordination, poor balance, bladder or bowel changes, and psychological changes.

T-cell

A lymphocyte (white blood cell) that develops in the bone marrow, matures in the thymus, and works as part of the immune system in the body.

Urologist

A physician who specializes in the branch of medicine (urology) concerned with the anatomy, physiology, disorders, and care of the male and female urinary tract, as well as the male genital tract.

U.S. Food and Drug Administration (FDA)

The U.S. federal agency that is responsible for enforcing governmental regulations pertaining to the manufacture and sale of food, drugs and cosmetics. Its role is to prevent the sale of impure or dangerous substances. Any new agent that is proposed for the treatment of MS in the U.S. must be approved by the FDA.

Visual evoked potential (VEP)

A test in which the brain's electrical activity in response to visual stimuli (e.g., a flashing checkerboard) is recorded by an electroencephalograph and analyzed by computer.

Demyelination results in a slowing of response time. Because this test is able to confirm the presence of a suspected brain lesion (area of demyelination)

as well as identify the presence of an unsuspected lesion that has produced no symptoms, it is extremely useful in diagnosing MS. VEPs are abnormal in approximately 90 percent of people with MS.

Vocational rehabilitation (VR)

Vocational rehabilitation is a program of services designed to enable people with disabilities to become or remain employed. Originally mandated by the Rehabilitation Act of 1973, VR programs are most often carried out by state agencies. In order to be eligible for VR, a person must have a physical or mental disability that results in a substantial handicap to employment. VR programs typically involve evaluation of the disability and need for adaptive equipment or mobility aids, vocational guidance, training, job-placement, and follow-up.

White matter

The part of the brain that contains myelinated nerve fibers and appears white, in contrast to the cortex of the brain, which contains nerve cell bodies and appears gray.

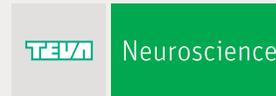
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The National MS Society’s mission is for people affected by MS to live their best lives as we stop MS in its tracks, restore what has been lost and end MS forever. To fulfill this mission, the Society funds cutting-edge research, drives change through advocacy, facilitates professional education, collaborates with MS organizations around the world, and provides services designed to help people with MS and their families move their lives forward.

The National Multiple Sclerosis Society (“Society”) is proud to be a source of information on multiple sclerosis related topics. The information provided is based on professional advice, published experience, and expert opinion, but does not constitute medical or legal advice. For specific medical advice, consult a qualified physician. For specific legal advice, consult a qualified attorney.

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