



Timeline of Progress in MS Research

This timeline highlights a selection of major landmarks in research into multiple sclerosis and the launch of programs to propel this research forward. These are only a few of thousands of advances in basic and clinical research that have laid the foundation for the rapid progress we're seeing today.

- 1421 First documented case of MS; St. Lidwina of Schiedam
- 1860-70 First studies of myelin and glial cells in brain tissue
- 1868 First correlation of MS clinical symptoms with central nervous system pathology; disease named "Sclerose en plaques" by Jean Martin Charcot
- 1869 First attempts to treat MS with gold chloride, zinc, sulfate, silver nitrate, strychnine and electrical stimulation (by Charcot)
- 1928 Discovery that myelin is produced by oligodendrocyte glial cells
- 1933 Acute experimental allergic encephalomyelitis (EAE) developed as model for MS
- 1936 Discovery that lymphocytes are involved in immune function
- 1943 First detailed description of the composition of myelin
- 1946 National MS Society USA Launched**
- 1947 First research grant to Elvin A. Kabat, MD
- 1950 National Institute of Neurological Diseases founded at National Institutes of Health through the work of the Society
- 1950 Society funds first major survey of MS in the U.S. and Canada
- 1954 First Fellowship programs to train MS Scientists offered
- 1965 Society-convened panel of experts develops precise criteria for diagnosing MS
- 1969 Society co-funds research of steroid ACTH, which becomes the first drug shown to speed recovery from MS relapses
- 1974 Society convinces U.S. Congress to appoint commission on MS; resulting report increases federal funding for MS research
- 1980 Society funds first large trial of any form of interferon (interferon alpha), stimulating interest in interferons for treating MS
- 1981 First MRI pictures of a brain affected by MS are produced, revolutionizing MS diagnosis
- 1981 Identification of oligodendrocytes in MS brain with capability for regeneration of myelin
- 1982 Society partners with MS Society of Canada to convene international conference leading to standards for clinical trials in MS. The first controlled trial of natural human beta interferon in MS was an outgrowth of this meeting.

- 1983 Society supports studies of the anti-cancer agent mitoxantrone in an animal model of MS. In 2000, this drug (Novantrone) is approved by FDA to treat worsening MS
- 1984 First modern documentation of cognitive problems in MS
- 1987 Pilot Research Program established by Society to quickly test novel, high-risk ideas
- 1987 Society establishes program to attract research proposals in patient management, care and rehabilitation
- 1988 Health Care Delivery and Policy Research Program established by Society
- 1988 First demonstration, using MRI, that there is significant lesion activity in MS brain, even when the disease is clinically quiescent
- 1992 Society supports first comprehensive search for genes that make people susceptible to MS, initiating targeted research program in MS genetics
- 1993 Betaseron approved by FDA for relapsing-remitting MS, becoming first drug approved that effects underlying disease. The Society had supported the first study of any type of interferon in MS
- 1996 Society grantees find that aerobic exercise improves physical and psychological well-being in persons with MS
- 1996 Society develops international consensus on 4 clinical descriptions of M (relapsing-remitting, secondary-progressive, primary-progressive, progressive-relapsing)
- 1996 Avonex and Copaxone approved for relapsing-remitting MS. The Society funded early basic research underlying both therapies
- 1997 Zanaflex (tizanidine) approved for treatment of spasticity
- 1997 Sylvia Lawry Physician Fellowship Program established to train doctors in conducting clinical trials in MS
- 1998 Society launches targeted research initiative into gender differences in MS
- 1999 Society initiates first-ever longitudinal patient-focused database effort, the Sonya Slifka MS Longitudinal Study, providing quality of life and socioeconomic data
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- 1999/2000 Society initiates new clinical trial in estrogen treatment for women with MS and T-cell vaccination, both of which had their origins in early fundamental NMSS research
- 2000 Society initiates international collaborative research effort to better correlate the MS lesion with disease state and MRI: The MS Lesion Project
- 2000 Novantrone approved in U.S. for worsening forms of MS
- 2001 Society task force develops new diagnostic criteria for MS, which may shorten the time it takes a person to receive a firm diagnosis.
- 2001 Society collaborates with NIH on a \$20-million research initiative on gender-based differences in immune responses to increase understanding and treatments
- 2002 Rebif approved in U.S. to treat relapsing-remitting MS

- 2002 New Career Transition Fellowship Program launched to foster promising young MS investigators
- 2003 Society convenes international Task Force on Nervous System Repair to identify ways to speed development of repair strategies to restore nerve function in MS
- 2003 Society launches Collaborative MS Research Centers, 5-year awards to team up scientists and clinicians from a variety of fields to work on promising avenues
- 2003 Italian researchers transplant cells to enhance nerve tissue repair in mice with MS
- 2004 A pivotal study by a Society Fellow compares the clinical characteristics of MS among hundreds of African- and Caucasian Americans, showing that African-Americans tend to have a more aggressive course
- 2005 Society launches Promise:2010 campaign to raise at least \$30 million for cutting-edge research and clinical care initiatives including 6 Pediatric MS Centers of Excellence
- 2005 Society launches initiative to speed nervous system repair and protection clinical trials in MS with 4 international teams funded for \$15.6 million
- 2005 “McDonald Criteria” for diagnosing MS updated by Society Task Force, speeding time to diagnosis for many
- 2005 Society collaborates with NIH, MS Society of Canada and University of Washington on international workshop to move MS rehabilitation research forward.
- 2006 Tysabri approved in U.S. for treating relapsing MS
- 2006 Long-term Care Caucus convened to create national agenda to foster spectrum of long-term care options for people with MS
- 2007 Society and MS International Federation convene a Stem Cell Research Summit of leading stem cell and MS experts to explore the potential of all types of stem cell research for MS and to set research priorities
- 2007 First large-scale trial of sex hormone estriol gets underway in women with MS, a result of the Society’s targeting of gender differences
- 2007 With support from Society to International MS Genetics Consortium, two genes are confirmed to be linked to susceptibility to MS; more likely to be uncovered
- 2007 Society launches *Fast Forward* to speed treatments to people with MS by partnering with industry to develop new therapies
- 2007 Society’s Task Force on MS Epidemiology meets to outline future research directions for funding agencies that will further the search for the cause of MS; through its efforts, a disease tracking system is being piloted by the Centers for Disease Control’s ATSDR
- 2007/2008 Congressional MS Caucus launched to raise awareness and engage in discussion about access to health care, increase in research funding, disability rights and other MS issues, with members from the House and Senate
- 2008 MS activists secure a place for MS research in the \$50 million Congressionally Directed Medical Research Program, administered through the Department of Defense, plus \$5 million restricted to MS research within the CDMRP
- 2008 Society funds genome scan by International MS Genetics Consortium of 10,000 patients to validate a large-scale study and to study the influence of copy number variants and gene-to-gene interactions in MS susceptibility
- 2009 Fast Forward makes investments in 7 companies working on early stage MS therapies

- 2009 International task force convened by Society publishes landmark guidelines on the complex process of telling MS from look-alike disorders (“differential diagnosis”)
- 2009 Extavia is approved by the FDA as a new brand of interferon beta-1b
- 2009 Society convenes international workshop on strategies to find the cause of MS, and factors that drive progression and ways to estimate MS frequency
- 2009 Society holds first-ever Don Tykeson Fellows Conference to stimulate new research ideas and strengthen the commitment of bright young people to MS research
- 2009 Fast Forward joins forces with EMD Serono to fast-track new therapies for MS
- 2010 Gilenya, first oral disease-modifying therapy for MS, approved for relapsing forms
- 2010 Ampyra approved to improve walking ability in people with all types of MS
- 2010 Fast Forward, Juvenile Diabetes Research Foundation and Axxam SpA Join Forces to accelerate development of treatments
- 2010 Society releases a request for proposals resulting in funding 2 feasibility studies on risk factors that drive MS progression and prognosis
- 2010 Nuedexta and Botox approved to treat specific symptoms that interfere with quality of life in people with MS
- 2010 Rapid collaboration and support for research on CCSVI
- 2010 International team co-supported by Society revises MS diagnostic criteria to reduce the wait for accurate diagnosis
- 2011 Society supports controlled study to determine whether vitamin D supplements can reduce MS disease activity
- 2011 Promise: 2010 Nervous System Repair initiative is completed, having jump-started the field, trained scores of promising young investigators, produced over 180 research papers, and leveraged millions of dollars in new funding
- 2011 Society-supported global consortium doubles the number of MS risk genes identified
- 2012 Launch of International Progressive MS Alliance to speed the development of therapies
- 2012 Aubagio approved by FDA as second oral therapy for relapsing forms of MS
- 2012 Society task force launches effort to create a better tool to track benefits of therapies on disability in MS, leading to formation of the MS Outcome Assessments Consortium
- 2012 Launch of studies into whether bacteria in the gut influence MS disease activity or risk
- 2013 Tecfidera approved by FDA as third oral therapy for relapsing forms of MS
- 2013 Society partners with two foundations to form a research network of 10 leading universities aimed at screening drugs that show potential for treating brain diseases
- 2013 Barancik Prize for Innovation in MS Research is launched to inspire novel research
- 2013 Society commits \$2.5 million to support the Network of Pediatric MS Centers to provide essential infrastructure to facilitate research
- 2013 Researchers co-funded by the Society transplant stem cells derived from human skin into mice to successfully grow nerve-insulating myelin
- 2013 Launch of MS Prevalence Work Group to update the estimate of MS prevalence in the US
- 2013 Society-funded researchers report that dietary salt can speed the development of an MS-like disease in mice and may influence immune activity in MS

- 2014 New, less frequent dose of Copaxone approved
- 2014 Plegridy, an interferon taken by subcutaneous injection every 2 weeks, is approved
- 2014 Lemtrada, given in two courses of IV infusion, is approved for relapsing forms of MS
- 2014 Society convenes Wellness conference to map out gaps and opportunities in research and programs to find wellness solutions for people with MS
- 2014 Large trial of ibudilast, funded by NIH and Society, begins recruiting participants with progressive MS to test its ability to protect the nervous system from damage
- 2014 International Progressive MS Alliance awards its first 22 research grants
- 2015 Ocrelizumab becomes first experimental therapy to show positive effects in primary progressive MS in large-scale trial
- 2015 First generic form of Copaxone, given by daily injections, approved
- 2015 International initiative is launched to focus on how having MS and other conditions (co-morbidities) influences disease course and treatment
- 2015 A phase 2 clinical trial co-funded by the Society suggests a pill used to treat epilepsy (phenytoin) has the potential to slow the accumulation of disability in people with MS
- 2015 Results of phase 2 trial of anti-LINGO suggests it has potential as myelin repair strategy
- 2015 Society co-hosts international conference on cell-based therapies to forge next steps for cell therapy in MS
- 2015 Society funding helps launch MS Microbiome Consortium to promote research on the role of gut bacteria in MS progression and treatment
- 2015 Society's 5-year, \$250 million NOW (No Opportunity Wasted) campaign was successfully concluded, launching more MS research and driving more life-changing progress than what occurred at any other time in the Society's history
- 2016 Positive results from a phase 3 trial of siponimod for secondary progressive MS break through a long-standing barrier
- 2016 Positive results announces from two studies of bone marrow-derived stem cells (HSCT) in people with aggressive, relapsing MS; more research focuses on who might benefit and how to reduce risks
- 2016 Society-funded International Consortium of MS Genetics identifies 200 genetic variations linked to MS, offering new leads to how genes and other factors that make people susceptible to developing MS
- 2016 The antihistamine clemastine, identified with Society support, shows evidence of promoting myelin repair in a small clinical trial
- 2016 Society launches two new studies testing the ability of dietary approaches to treat MS symptoms and improve quality of life
- 2016-17 International Progressive MS Alliance awards three large-scale Collaborative Network Awards to promote solutions for people with progressive MS
- 2017 FDA approves Ocrevus (ocrelizumab) as first disease-modifying therapy for primary progressive MS, and also as a therapy for relapsing MS
- 2018 International team co-supported by Society revises MS diagnostic criteria to speed the diagnostic process and reduce the chance of misdiagnosis

- 2018 FDA approves expansion of the use of Gilenya to include children and adolescents 10 years of age or older with relapsing MS, the first therapy specifically approved to treat pediatric MS
- 2018 A Phase 2 trial showed that ibudilast could reduce brain atrophy in progressive MS. The trial was funded collaboratively by the National MS Society, the NINDS, its NeuroNext trials network, with support by MediciNova, the supplier of ibudilast
- 2018-19 Results were announced from several studies of bone marrow-derived stem cells in people with aggressive, relapsing MS. More research is focused on who might benefit and how to reduce risks
- 2019 A study sponsored by the National MS Society conducted by leading experts estimates that nearly 1 million adults are living with MS in the United States. This is more than twice the previously reported number
- 2019 FDA approves oral Mavenclad (cladribine) for adults with relapsing forms of MS, and also approves oral Mayzent (siponimod) for adults with clinically isolated syndrome (an initial neurological episode) and relapsing forms of MS
- 2019 FDA approved Vumerity™ (diroximel fumarate, Biogen and Alkermes plc) for relapsing MS
- 2020 National MS Society releases recommendations for aHSCT-bone marrow transplant for MS
- 2020 FDA approves generic form of Tecfidera for relapsing MS
- 2020 FDA approves Kesimpta® (ofatumumab) for relapsing MS
- 2020 Society-supported Wellness Research Group publishes exercise and physical activity recommendations for ALL people with MS
- 2020 National MS Society, Consortium of MS Centers, and others establish the North American MS COVID-19 Clinical Database
- 2020 FDA approves Oral Bafiertam™ (Monomethyl Fumarate) for relapsing MS
- 2020 FDA approves Oral Zeposia® (Ozanimod) for relapsing MS