Fact Sheet: Driving Research on Progressive MS

Progressive MS is a focus of the National MS Society's Strategic Response to MS. MS progression can be slow or it can be fast, but it occurs in many of those who have the disease, even in people successfully treated for relapses. ***That's why addressing the challenges of progressive MS is a primary target of the Society's research strategy to stop MS, restore function and end MS forever.***

Advances for People with Progressive MS

- Our funding led to the identification of 4 types of MS lesion patterns, changing the way researchers view MS
- We funded the first study showing that natural repair occurs in MS lesions, paving the way for a whole new field of inquiry
- Society researchers discovered that human adult brains have replacement cells for myelin, and showed that transplanting those cells could restore function in mice
- We pioneered research on cognition problems in MS as well as rehabilitation strategies to address them
- We funded development of a tools that measure improvements in quality of life
- Early Society-funded trials on a therapeutic approach led to the first approved medicine to improve walking in MS
- Society grantees were first to show that aerobic exercise could fight MS fatigue, changing doctors' age-old advice to "take it easy"
- Our research on gender differences led to the first clinical trials of sex hormones to treat MS
- Society initiatives created the tools that have enabled quicker MS diagnosis, reducing the agonizing wait for countless people

> ***"We need a different approach to understand what drives progression and find treatments to stop progression and restore function.***
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> ***These are major goals of the Society's research strategy."***
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> **Timothy Coetzee, PhD**
> Chief Research Officer
> National MS Society

Current Priorities for Research on Progressive MS

- Accelerate clinical trials in progressive MS
- Understand what drives progression and find new therapies to treat it
- Find better rehabilitation and treatments for symptoms to improve quality of life
- Discover how nerve cells are damaged and how to repair them to restore function

Why Aren't There More Treatments for Progressive MS?

- Virtually every therapy approved for relapsing MS has been tested, or is now in testing, in people with progressive forms of the disease
- Clinical trials involving people with relapsing MS often rely on counting relapses or doing MRI scans to detect immune activity
- Unfortunately, progression is not easily measured using MRI. The fact that there is no easy way to detect progression quickly is one reason why drug development for progressive MS is behind
- Large clinical trials are going on RIGHT NOW in progressive MS, including tests of Tysabri,® Gilenya,® Ocrelizumab, and Masitinib

> ***"We need to understand why MS differs so much from one person to another, which will teach us what drives progression and how to treat it. We're definitely going to stop MS - it's only a matter of having a better understanding of the underlying pathology. With research and time, this will happen."***
>
> **Richard Rudick, MD** (Cleveland Clinic Foundation)

National MS Society Priorities for Research on Progressive MS

1) Accelerate clinical trials in progressive MS

- We're collaborating worldwide to speed clinical trials in progressive MS
  - The Society-supported MS Outcome Assessments Consortium (MSOAC) is working on a new measure of MS disability that will be recognized by the FDA and the European Medicines Agency to speed new therapies for MS, particularly progressive forms of the disease; this could reduce the years-long waiting period to observe a person's disease progression, and improves the chances of successful clinical trials in progressive MS
  - The International Progressive MS Collaborative is working to develop a framework for increased research support and funding in progressive forms of MS
  - Through the International Committee on Clinical Trials in MS, researchers are working on better definitions of MS and progression based on underlying biology, to improve MS diagnosis, treatment and clinical trials
- We're funding clinical trials of neuroprotection as proof of concept for stopping progressive MS:
  - Riluzole – inhibits release of glutamate, which may accumulate and be toxic in MS
  - Estriol added to Copaxone – estriol is a sex hormone that may protect against nerve injury
  - Lipoic acid – antioxidant may help block nerve fiber damage in MS
  - Phenytoin – reduces entry of sodium into nerve fibers (funded in collaboration with the MS Society of the United Kingdom)
  - Oxcarbazepine – we are funding an "add-on" study to a trial of this epilepsy therapy in people with secondary-progressive MS, to determine the usefulness of a biomarker in this study.
  - The MS-STOP trial which is testing four therapies that may have nerve-protecting properties in secondary-progressive MS (funded in collaboration with the MS Society of the United Kingdom)

2) Understand mechanisms that drive progression and find new therapies to treat it

- Explore mechanisms that drive injury to the brain and spinal cord to expose new potential therapeutic targets along the injury pathways that may stop the damage
- Advanced imaging and laboratory studies seeking to define and track the full measure of MS disease activity, MS lesions, and atrophy in the brain and spinal cord
- Epidemiology studies of people with MS designed to identify factors that contribute to the risk of MS progression
- Developing new laboratory tools to accelerate discovery of potential drug treatments.

> ***"It's important to remember that it's only in the last few years that we really realized that the adult brain has stem cells that are capable of being activated to promote repair."***
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> **Robert Miller, PhD**
> (Case Western Reserve University)

3) Discover how nerve cells are damaged and how to repair them to restore function

- Studies exploring the potential of different types of stem cells to repair the nervous system in models of the disease, and ways to enhance the survival of repair cells in the inflamed and scarred nervous system of people with MS
- Efforts focusing on high-tech imaging tools to better measure nerve tissue damage and assess nerve protection and repair without having to wait possibly years to observe a person's disease progression
- Investigations to design new ways of conducting clinical trials and to develop better outcome measures to speed up the testing of promising repair strategies

4) Find better rehabilitation and treatments for symptoms to improve quality of life

- Studies investigating complementary and non-traditional therapies to combat specific symptoms
- Tests of innovative rehabilitation techniques to improve walking, strength and balance, and fellowship programs that train new talent in best practices for MS rehabilitation research
- Studies focusing on exercise and other non-pharmaceutical strategies to enhance wellness and combat painful spasticity (extreme muscle tightness) and MS fatigue
- Research on thinking and memory problems, and therapies and coping strategies to address them
- Society investments in companies developing better treatments for pain and spasticity

THINGS WE NEED TO KNOW ABOUT PROGRESSIVE MS

- Why do some people have very slow progression while others worsen quickly?
- What factors influence the transition from relapsing MS to the secondary-progressive stage of MS?
- What causes nerve degeneration in MS?
- How similar or different are progressive forms of MS?

The Answers Should Point to New Therapies to Stop Progression, Repair Damage, and Restore Function