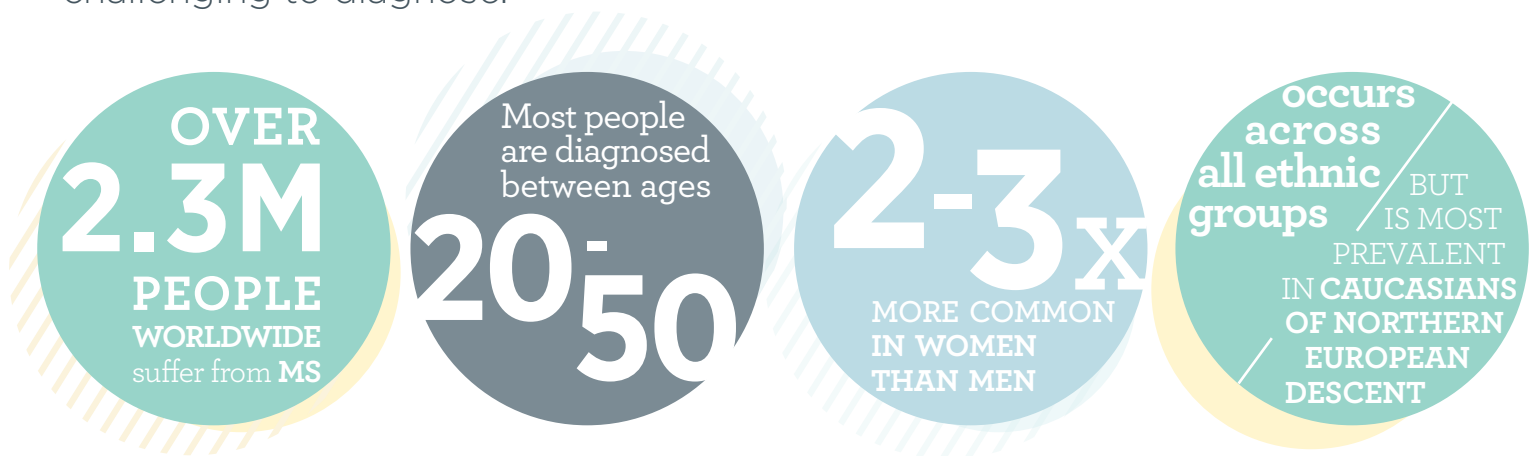


**MULTIPLE SCLEROSIS (MS)** is an unpredictable and often disabling autoimmune disease, where a patient's own immune cells attack the nerve covering—an insulating layer called *myelin*—of the brain, which disrupts the flow of information from the brain to other parts of the body. Ranging from mild to severe, MS symptoms differ from patient to patient and can change and fluctuate over time. Symptoms include everything from fatigue to numbness, vertigo, unstable gait, depression and cognitive changes. MS is challenging to diagnose.



Citations on reverse side

### HMO RESEARCH:

Professor Tamir Ben-Hur—world-renowned stem cell research specialist and head of Hadassah Medical Organization's prestigious Department of Neurology—hypothesized that transplanted stem cells could play a vital role in combating and curing diseases such as MS.

Expecting that the transplanted stem cells would regenerate myelin, his team discovered that stem cells actually spur the brain to help itself.

- HMO researchers led by Professor Dimitrios Karussis, head of the Multiple Sclerosis Center, conducted the first clinical trial injecting bone marrow-derived stem cells into the patient's spinal fluid, and found that they
  - Inhibit inflammation
  - Prevent immune cells from activating and inflicting injury to the brain
  - Facilitate repair processes

### HMO COLLABORATIONS:

Center of Regenerative Medicine at the University of Edinburgh, Scotland

### NEXT STEPS:

- The world's first double-blind, placebo-controlled study treating MS patients with adult mesenchymal (bone marrow-derived) stem cells injected into the spinal cord, is in progress at HMO. The trial includes 48 patients. The ultimate goal is to generate new myelin—the coating of nerve cells that is destroyed by the disease and is crucial to preventing nerve degeneration.
- Transplanting stem cells into animals to determine if they can, indeed, generate myelin-forming cells
- Exploring how to strengthen the function of the brain's existing adult stem cells, to help the brain protect itself from diseases like MS

### GENDER EQUITY:

Worldwide, medical research disproportionately focuses on men - leading to misdiagnosis and compromised care for women. Help Hadassah advocate for gender equity in medical research (GEM).

### THE POWER IS IN YOUR HANDS.

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## **OVER 2.3M PEOPLE WORLDWIDE SUFFER FROM MS**

**Cleveland Clinic Center for Continuing Education:** *"MS affects approximately 400,000 people in the US and 2.5 million worldwide."*

**National Institute of Health:** *"An estimated 1.1 to 2.5 million people worldwide have multiple sclerosis."*

**National MS Society:** *"At the present time, MS incidence and prevalence is not consistently reported and tracked in the U.S.... The current estimate of MS prevalence in the United States was determined through a National MS Society effort in 2002. The resulting figure of 400,000 individuals estimated to have MS was calculated by applying age-specific rates to various age subgroups on Census 2000 data."*

## **MOST PEOPLE ARE DIAGNOSED BETWEEN AGES 20-50.**

**Cleveland Clinic Center for Continuing Education:** *"MS symptoms can start anywhere between 10 and 80 years of age, but onset is usually between 20 and 40 years, with a mean of 32 years."*

**Mayo Clinic:** *"MS can occur at any age, but most commonly affects people between the ages of 15 and 60."*

## **2-3X more common in women than in men.**

**University of Maryland Medical Center:** *"MS is about 2.5 times more common among women than men."*

**Mayo Clinic:** *"Women are about twice as likely as men are to develop MS."*

## **OCCURS IN ALL ETHNIC GROUPS, BUT IS MOST PREVALENT IN CAUCASIANS OF NORTHERN EUROPEAN DESCENT.**

**Mayo Clinic:** *"White people, particularly those of Northern European descent, are at highest risk of developing MS. People of Asian, African or Native American descent have the lowest risk."*

**University of Maryland Medical Center:** *"Multiple sclerosis occurs worldwide but is most common in Caucasian people of northern European origin, especially those of Scottish descent."*