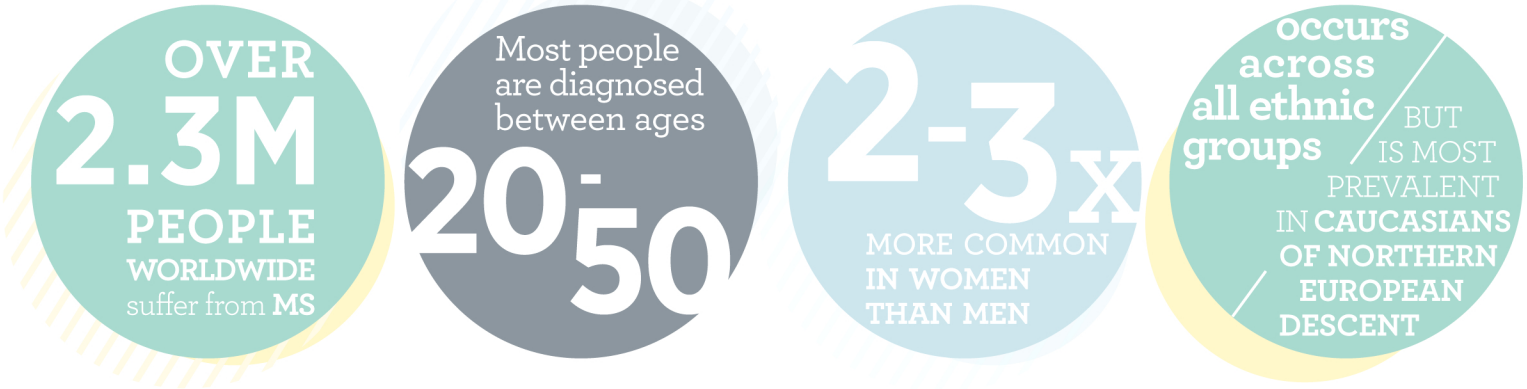
MULTIPLE SCLEROSIS (MS) is an unpredictable and often disabling autoimmune disease, where a patient's own immune cells attack the nerve covering—an insulating layer called *myelin*—of the brain, which disrupts the flow of information from the brain to other parts of the body. Ranging from mild to severe, 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.



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

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