Transcript Details
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Cell-Based Therapies for Multiple Sclerosis: Stem Cells, CAR T Cells, and Emerging Treatments

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Wren: Welcome to *Neuro Frontiers*, a series in which *Practical Neurology* partners with ReachMD to bring you clinical research and advancements that further clinicians' ability to diagnose and treat neurologic conditions.

On this episode, we'll hear from Mark Freedman, MD, a professor of medicine in neurology at the University of Ottawa and a senior scientist at the Ottawa Hospital Research Institute. He'll be sharing insights on cell-based therapies for multiple sclerosis (MS), a topic he discussed at the 2026 Consortium of Multiple Sclerosis Centers (CMSC) Annual Meeting.

Here's Dr. Freedman now.

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Mark Freedman, MD: Cell-based therapies, compared with disease-modifying therapies, are really looking at the biological type of therapeutic responses that people can get from their own bodies. I think your own immune system is capable of healing and controlling disease, and all we're doing is exploiting that ability by trying to obtain cells that are capable of doing this.

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Cell-based therapies are of two forms. One is replacement, and the other is, can we modify cells to do something that they maybe don't normally do? In the case of replacement, in very aggressive forms of multiple sclerosis, we go as far as removing the entire immune system and replacing it through stem cells.

Otherwise, the patient would die from the combined immunotherapy and immunoablative therapy, which destroys your immune system that we think is causing all the disease. So we can replace the entire immune system. We grow it from their own stem cells. So those cells are really not necessarily doing anything, but they're replacing the immune system, which had to be removed because it was causing all the bad disease.

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But in recent years, some cells can actually be encouraged to do other things. The mesenchymal stem cells are also derived from bone marrow, and if we culture them, there may be an ability for these cells to actually go into the body, seek out areas of damage, and repair. Attempts to do that in MS have not necessarily been successful, but there are lots of reasons why that might be.

Nevertheless, that still remains an open area of research.

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The most exciting ones are the more recent approaches, which are these so-called CAR T cells, because you can manipulate the receptors on the cells to actually bind things that they don't normally bind. And in the case of the most common CAR T cells, they're directed against one of the little proteins on the B cells.

So it's a very, very modified form of B-cell–depleting therapy, which is very expensive to do and sometimes can be made from a patient's own cells. Or there are lots of companies that actually make these cells and put them in, but they're really in their infancy.

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Wren: Thank you to Dr. Mark Freedman for discussing the mechanisms behind cell-based multiple sclerosis therapies. And thanks to you, our listeners. Be sure to visit practicalneurology.com for more podcasts in the field of neurology.

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