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“New research has moved my disease out of permanent disability and into a life where I can fully participate as a physician, friend and active member of my community.”

Alex, diagnosed with MS in 2007

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Collaborative research
Strength in numbers

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Our digestive tract contains trillions of bacteria that together make up our gut microbiome. In fact, the bacteria that live in our bodies outnumber the human cells that make up our various tissues by a factor of ten to one. Of course, these little passengers aren’t just along for the ride; while they enjoy a place to call home and a constant supply of food, we benefit from their ability to break down our food into vital nutrients that we need to survive.

The gut microbiome plays an even larger role beyond helping us digest our food. Disruption of the delicate balance of different bacteria residing in our gut can have enormous implications for many of our body’s essential biological functions—from our metabolic processes to the health of our immune system. How the gut microbiome influences disease is a question on many researchers’ minds.

The gut microbiome is shaped by various exposures we come across in life, such as the food we eat, any infections we’ve acquired or drugs we’ve taken. The influence of these factors is particularly strong during childhood development, a time in which the gut microbiome acts as a “tuning fork” for the developing immune system. Research is revealing that imbalances in the gut microbiome composition in early life can lead to the development of food sensitivities, allergic reactions and asthma. Could this also be the case for autoimmune disease like multiple sclerosis?

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Gut microbiome and its link to MS

Researching MS takes guts
Risk Factors

To 2018. To view our privacy policy, please visit our website at www.mssociety.ca/privacy. The MS Society is a registered charity. Registration #82461 1001 R 0018. To find out how you can contribute to large-scale initiatives like the MSSRF, email lee.nichols@mssociety.ca
Mucosal injuries and gut inflammation can sometimes go awry. Emerging evidence from animal studies suggests that changes to the gut microbiome can trigger autoreactivity and harmful inflammation. But what does this mean in the context of MS? Researchers are now embarking on the task of comparing the gut microbiome in people living with MS to healthy individuals while posing the following questions: “How do they differ? Why do they differ? Could this be important?” Dr. Helen Tremlett, Professor at the University of British Columbia, is taking a fresh approach to this perplexing question. As part of a collaboration with the Canadian Pediatric Demyelinating Disease Study funded by the MS Society of Canada and MS Scientific Research Foundation, Dr. Tremlett has set out to gather clues about how the gut microbiome could provide new, meaningful insights into the origins and drivers of MS. “The bacteria in your gut educates your immune system, and vice versa,” says Dr. Tremlett. “We really believe we’re onto something important in pursuing these lines of research.”

Can changing one’s gut microbiome through diet and lifestyle influence the course of MS? Dr. Tremlett admits that it’s too early to say. “There is currently no ‘one size fits all’ evidenced-based method of saying to an individual ‘do this, eat that and this will happen’,” says Dr. Tremlett. However, she hopes that information from her study will help us better understand how the bacteria that live within us play a role in health and disease, and particularly how they may drive or control MS.

People living with multiple sclerosis were historically advised to avoid physical activity for fear that physical exertion would make them feel worse. Over the past few decades, new research has uncovered considerable benefits associated with increased physical activity. Now, people living with MS are encouraged to pursue a more active lifestyle that fits their own capabilities and interests. In addition to improving overall physical function, there is evidence that physical activity can help maintain a person’s independence, enhance their quality of life, and lead to improved cognitive function and brain health.

Researchers have been investigating the relative benefits of different types of physical activity for people living with MS, through clinical trials and questionnaire-based studies. Here’s a snapshot of some current research findings that will provide insights into how different types of physical activity may help manage MS symptoms.

5. Ratcliff et al. NeuroRehabilitation. 2015

WALKING: Treadmill walking has been shown to improve mobility,1 increase cognitive performance,2 and decrease fatigue.3 Running and jogging is linked to smaller brain lesions and lower relapse rate in children and teens living with MS.4

CYCLING: When paired with functional electrical stimulation as a rehabilitation strategy, cycling could lead to improvements in walking speed and endurance, leg muscle strength, and quality of life in people living with progressive MS.5

AQUATIC TRAINING: Ai Chi, an aquatic exercise program that is used for relaxation and physical rehabilitation, has been demonstrated to improve pain, fatigue, spasm, and depression.6

STRENGTH TRAINING: Strength training, in particular for the hips and legs, may be an effective method for improving balance,7 quality of life, and fatigue in people with MS.8

YOGA: Certain yoga programs including Ananda, Hatha and Raja yoga, are linked to improved quality of life, diminished pain, and improved balance, fatigue, and walking performance.9

EXERCISE AND VIDEO GAMING (Exergaming): Some videogame training programs have been shown to improve balance in a fun way, which in turn improves motivation and adherence.10
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Researching MS takes guts

Gut microbiome and its link to MS

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As the research community builds its understanding of MS and all of its intricacies, it’s encouraging to know that no stone is being left unturned. In addition to examining all potential causes, triggers, and treatment targets, researchers are engaging in collaborations that enable them to combine expertise and resources. I look forward to seeing progress in previously unexplored areas of research, and providing funding opportunities at the MS Society that aim to stimulate innovation and translation of exciting results.

For more MS research stories, visit my blog at DrKarenLee.ca or follow me on Twitter @DrKarenLee.

Sincerely,
Dr. Karen Lee
Vice-president, research

Trending in MS research
Noteworthy advancements

Canada has the highest rate of multiple sclerosis in the world. It’s because of our donors, event participants, and volunteers that we are able to fund some of the best MS research in the world, right here in Canada. To read more about the studies mentioned below and the latest in MS research, visit mssociety.ca/research-news, and follow @MSSocietyCanada on Twitter.

MS Society of Canada @MSSocietyCanada Dec 18
Early-stage study shows that vitamin D can promote myelin repair. Evidence has recognized vitamin D as a protective factor against the development of multiple sclerosis. #VitaminD #endMS

MS Society of Canada @MSSocietyCanada Oct 8
MS Scientific Research Foundation-funded research draws links between exercise and disease severity in children living with MS. #exercise #IncreasedMobility #endMS

MS Society of Canada @MSSocietyCanada Oct 1
Promising results from ocrelizumab clinical trial: shows potential for reducing disability progression in people living with primary-progressive MS. #Progressive #TeamFight

MS Society of Canada @MSSocietyCanada Dec 2
Study strengthens understanding of the inflammatory nature of MS—potential to propel the development of therapies for progressive MS. #endMS #ProgressiveMS
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