



Title: Determining the relationship between chronic cerebrospinal venous insufficiency (CCSVI) and multiple sclerosis (MS)

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- A series of recent publications have suggested that some people with MS have obstructions in the veins that drain blood in the brain and spinal cord that may contribute to nervous system damage in MS.
- Dr. Costello's team is examining a cross-section of 120 people with MS compared to 60 healthy controls, seeking linkages between vein abnormalities and different aspects of MS activity and tissue damage.
- Their results should provide insight into the significance of differences in vein drainage and the implications for the future treatment of MS.

About the Investigator: Fiona Costello is a member of the Hotchkiss Brain Institute at the University of Calgary's Faculty of Medicine, as well as an MS treating neurologist and neuro-ophthalmologist at Foothills Medical Centre. She is also Director of the NeuroProtection and Repair Evaluation Unit of the Hotchkiss Brain Institute's Arresting MS Program. She trained at Memorial University of Newfoundland, where she completed her medical degree and residency training in neurology. In 2000, Dr. Costello did a clinical fellowship in neuro-ophthalmology at the University of Iowa Hospitals and Clinics before taking her first faculty position as Assistant Professor at the University of Ottawa. She moved to the University of Calgary in 2007, where is currently Associate Professor in the Departments of Clinical Neurosciences and Surgery. She has authored numerous relevant publications in the areas of MS and the use of optic neuritis as a system model of MS. She has received many honors including the North American Neuro-Ophthalmology Society Young Investigator Award; and was recently named one of Caldwell Partners Canada's "Top 40 Under 40" for advances in MS research. Dr. Costello, with co-investigator Dr. Michael Hill, Associate Dean of Clinical Research and a member of the Hotchkiss Brain Institute at the University of Calgary who has expertise in clinical epidemiology; has assembled a highly experienced team of collaborators including radiologists specializing in imaging of the blood vessels, interventional radiologists, and magnetic resonance imaging experts.

Details: This controlled study will carefully compare vein drainage between a cross-section of 120 people with MS with that seen in 60 healthy controls. In those MS patients who

exhibit signs of abnormalities of vein drainage, the investigators will explore whether the sites and severity of vein abnormalities correlate with common markers of MS disease activity, seeking linkages between any venous abnormalities observed and many different aspects and measures of MS activity and tissue damage.

The team is using ultrasound as originally used by Dr. Zamboni, and magnetic resonance studies of the veins (MR venography) to further explore the prevalence of venous insufficiency. The technologists and radiologists who interpret all scans will be blinded as to the clinical status of the participants.

This study should help quickly determine whether there are significant differences in venous drainage in people with MS, and their implications for the future treatment of MS.

Recruitment: A total of 180 participants including adults and children with MS and healthy participants. Participants with MS will be recruited from the Calgary MS Clinic at Foothills Medical Centre. Recruitment number is approximate and is subject to change.

Additional Personnel:

- Dr. Mayank Goyal, Hotchkiss Brain Institute, University of Calgary
- Dr. Richard Frayne, Hotchkiss Brain Institute, University of Calgary
- Dr. Jean K. Mah, Hotchkiss Brain Institute, University of Calgary
- Dr. Jephtha Davenport, Hotchkiss Brain Institute, University of Calgary
- Dr. James Scott, , University of Calgary

Quotes – Dr. Fiona Costello:

- “Dr. Zamboni’s findings have raised intriguing questions about the role of CCSVI in MS. At this point, our goal is to determine the prevalence of venous outflow insufficiency in a sizeable MS population, with validated and reliable measures of venous anatomy. Furthermore, we aim to study the concordance between the extent of venous obstruction and other established measures of disease activity.”
- “The data we obtain from our study will enhance our understanding about the role of venous insufficiency and possible consequences of myelin loss, axonal damage, and neuronal degeneration in MS.”