



Buffalo Neuroimaging Analysis Center

Chronic Cerebrospinal Venous Insufficiency (CCSVI) Research

The Buffalo Neuroimaging Analysis Center (BNAC) is committed to pioneering research in chronic cerebrospinal venous insufficiency (CCSVI). Below are links to published articles and abstracts on CCSVI by the BNAC research team. Also listed are items that have not yet been published, but have been accepted for publication and are in press. Some published research is copyright protected and available only to subscribers of the journals in which they are published. Others are part of free text journals in the public domain and available by searching PubMed. The list of all BNAC CCSVI affiliated publications will be updated regularly.

PUBLISHED ARTICLES

Venous angioplasty in patients with multiple sclerosis. Results of a pilot study.

Zamboni P, Galeotti R, Weinstock-Guttman B, Kennedy C, Salvi F, Zivadinov R. Eur J Vasc Endovasc Surg 2012;43:116-122.
Available through PMID: 21839654

<http://www.ncbi.nlm.nih.gov/pubmed/21839654>

Risk factors for chronic cerebrospinal venous insufficiency (CCSVI) in a large cohort of volunteers.

Dolic K, Weinstock-Guttman B, Marr K, Valnarov V, Carl E, Hagemeyer J, Brooks C, Kilanowski C, Hojnacki D, Ramanathan M, Zivadinov R. PLoS One 2011;6(11):e28062.

Available through PMID: 22140507

<http://www.ncbi.nlm.nih.gov/pubmed/22140507>

Decreased brain venous vasculature visibility on susceptibility-weighted imaging venography in patients with multiple sclerosis is related to chronic cerebrospinal venous insufficiency.

Zivadinov R, Poloni GU, Marr K, Schirda CV, Magnano CR, Carl E, Bergsland N, Hojnacki D, Kennedy C, Beggs CB, Dwyer MG, Weinstock-Guttman B. BMC Neurol 2011;11:128.

Available through PMID: 22011402

<http://www.ncbi.nlm.nih.gov/pubmed/22011402>

Chronic cerebrospinal venous insufficiency in multiple sclerosis: Diagnostic, pathogenetic, clinical and treatment perspectives.

Zivadinov R, Ramanathan M, Dolic K, Marr K, Karmon Y, Siddiqui AH, Benedict RHB, Weinstock-Guttman B. Expert Rev Neurother 2011;11:1277-1294.

Available through PMID: 21864074

<http://www.ncbi.nlm.nih.gov/pubmed/21864074>

Prevalence, sensitivity and specificity of chronic cerebrospinal venous insufficiency in MS.

Zivadinov R, Marr K, Cutter G, Ramanathan M, Benedict RHB, Kennedy C, Elfadil M, Yeh AE, Reuther J, Brooks C, Hunt K, Andrews M, Carl E, Dwyer MG, Hojnacki D, Weinstock-Guttman B. Neurology 2011;77:139-144.

Available through PMID: 21490322

<http://www.ncbi.nlm.nih.gov/pubmed/21490322>

Value of magnetic resonance venography for detection of internal jugular vein anomalies in multiple sclerosis. A pilot longitudinal study.

Zivadinov R, Galleotti R, Hojnacki D, Menegatti E, Dwyer MG, Schirda C, Malagoni AM, Marr K, Kennedy C, Bartolomei I, Magnano C, Salvi F, Weinstock-Guttman B, Zamboni P. AJNR 2011;32:938-45.

Available through PMID: 21474626

<http://www.ncbi.nlm.nih.gov/pubmed/21474626>

Hypoperfusion of brain parenchyma is associated with the severity of chronic cerebrospinal venous insufficiency in patients with multiple sclerosis: a cross sectional preliminary report.

Zamboni P, Menegatti E, Weinstock-Guttman B, Dwyer MG, Schirda C, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Bergsland N, Magnano C, Bartolomei I, Salvi F, Zivadinov R. BMC Medicine 2011; Volume 9 Issue 22

Available through PMID: 21385345

<http://www.ncbi.nlm.nih.gov/pubmed/21385345>

Chronic cerebrospinal vascular insufficiency is not associated with HLA-DRB*1501 status in multiple sclerosis patients

Weinstock-Guttman B, Zivadinov R, Cutter G, Tamaño-Blanco M, Marr K, Badgett D, Carl E, Elfadil M, Kennedy C, Benedict RHB, Ramanathan M. PLoS 2011; Volume 6.

Available through Pub Med PMID: 21340025

<http://www.ncbi.nlm.nih.gov/pubmed/21340025>

Use of magnetic resonance venography for characterization of the extra-cranial venous system in patients with multiple sclerosis and healthy controls

Zivadinov R, Lopez A, Weinstock-Guttman B, Schirda C, Magnano C, Kennedy C, Brooks C, Reuther J, Hunt K, Andrews M, Hojnacki D. Radiology 2011; Volume 258

Available through Pub Med PMID: 2177394

<http://www.ncbi.nlm.nih.gov/pubmed/21177394>

Chronic cerebrospinal venous insufficiency and iron deposition on susceptibility-weighted imaging in patients with multiple sclerosis: a pilot casecontrol study

Zivadinov R, Zamboni P, Haacke ME, Menegatti E, Weinstock-Guttman B, Schirda C, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Bergsland N, Hussein S, Heininen-Brown M, Bartolomei I, Salvi F, Zivadinov R. International Journal of Angiology 2010;

Available through PMID: 20351672

<http://www.ncbi.nlm.nih.gov/pubmed/20351672>

Use of neck magnetic resonance venography, Doppler sonography and selective venography for diagnosis of chronic cerebrospinal venous insufficiency: a pilot study in multiple sclerosis patients and healthy controls

Hojnacki D, Zamboni P, Lopez-Soriano A, Galleotti A, Menegatti E, Weinstock-Guttman B, Schirda C, Magnano C, Malagoni AM, Kennedy C, Bartolomei I, Salvi F, Zivadinov R. International Angiology 2010; Volume 2

Available through PMID: 20351669

<http://www.ncbi.nlm.nih.gov/pubmed/20351669>

CSF dynamics and brain volume in multiple sclerosis are associated with extracranial venous flow anomalies: a pilot study

Zamboni P, Menegatti E, Weinstock-Guttman B, Schirda C, Cox JL, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Dwyer MG, Bergsland N, Galeotti R, Hussein S, Bartolomei I, Salvi F, Ramanathan M, Zivadinov R. International Angiology 2010; Volume 2

Available through PMID: 20351670

<http://www.ncbi.nlm.nih.gov/pubmed/20351670>

The severity of chronic cerebrospinal venous insufficiency in patients with multiple sclerosis is related to altered cerebrospinal fluid dynamics

Zamboni P, Menegatti E, Weinstock-Guttman B, Schirda C, Cox JL, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Dwyer MG, Bergsland N, Galeotti R, Hussein S, Bartolomei I, Salvi F, Ramanathan M, Zivadinov R. Functional Neurology 2009; Volume 24

Available through PMID: 20018140

<http://www.ncbi.nlm.nih.gov/pubmed/20018140>

CORRESPONDANCE

Prevalence, sensitivity, and specificity of chronic cerebrospinal venous insufficiency in MS.

Morovic S, Menegatti E, Zivadinov R, Cutter G, Ramanathan M, Benedict RH, Weinstock-Guttman B, Baracchini C, Gallo P, Zivadinov R, Cutter G, Ramanathan M, Benedict RH, Weinstock-Guttman B, Albayram S, Kantarci F, Zivadinov R, Cutter G, Ramanathan M, Benedict RH, Weinstock-Guttman B. *Neurology* 2011;77:e124-6.

Available through PMID: 22105958

<http://www.ncbi.nlm.nih.gov/pubmed/22105958>

Chronic cerebrospinal venous insufficiency: Have we found the cause and cure of MS ?

Zivadinov R, Marr K, Fox RJ, Rae-Grant A. *Neurology* 2011;77:1710-1712.

Available through PMID: 22042799

<http://www.ncbi.nlm.nih.gov/pubmed/22042799>

Comment on no evidence of CCSVI at multiple sclerosis onset.

Zivadinov R, Ramanathan M, Dwyer MG, Marr K, Benedict RHB, Weinstock-Guttman B. *Ann Neurol* 2011;69:1062-3.

Available through Pub Med PMID: 21681801

<http://www.ncbi.nlm.nih.gov/pubmed/21681801>

ARTICLES IN PRESS

Intra- and extra-luminal structural and functional extra-cranial venous anomalies in multiple sclerosis, as evidenced by two non-invasive imaging techniques.

Dolic K, Marr K, Valnarov V, Dwyer MG, Carl E, Karmon Y, Kennedy C, Brooks C, Kilanowski C, Hunt K, Siddiqui AH, Hojnacki D, Weinstock-Guttman B, **Zivadinov R**. *AJNR* (CC; PBM)

Screening for chronic cerebrospinal venous insufficiency (CCSVI) using ultrasound: ISNVD consensus conference document.

Nicolaides AN, Morovic S, Menegatti E, Viselner G, Neuhardt D, Griffin MB, Setacci C, Cavezzi A, Lee BB, Thibault P, Andreozzi G, Al-Omari M, Bastianello S, Beggs CB, Ceconi P, Demarin V, Franceschi C, Galassi A, Haacke EM, Lagace A, Liasis N, Ludyga T, Lugli M, Maleti O, Mancini M, Marioni M, Marr K, Mc Donald S, Morrison N, Sclafani S, Scuderi A, Shepherd S, Simka M, Stella A, **Zivadinov R**, Zamboni, P. *Funct Neurol* (CC; PBM)

Sensitivity and specificity for screening of chronic cerebrospinal venous insufficiency using multimodal non-invasive imaging approach in patients with multiple sclerosis.

Dolic K, Marr K, Valnarov V, Dwyer MG, Carl E, Kennedy C, Brooks C, Kilanowski C, Hunt K, Hojnacki D, Weinstock-Guttman B, **Zivadinov R**. *Funct Neurol* (CC; PBM)

PUBLISHED ABSTRACTS

Comparative study of MR venography and doppler sonography in depicting extracranial venous abnormalities in multiple sclerosis patients and healthy subjects.

Dolic K, Marr K, Valnarov V, Dwyer MG, Carl E, Karmon Y, Kennedy C, Brooks C, Kilanowski C, Hunt K, Hojnacki D, Weinstock-Guttman B, Zivadinov R. *Neurology* 2011; Volume 76 (Supplement 4)

Multimodal diagnostic correlates between doppler sonography, catheter venography and intravascular ultrasound in detection of venous valve abnormalities during phase I PREMISe (Prospective Randomized Endovascular therapy in Multiple Sclerosis) study.

Karmon Y, Zivadinov R, Weinstock-Guttman B, Marr K, Valnarov V, Dolic K, Kennedy C, Carl E, Hopkins LN, Levy EI, Siddiqui AH. *Neurology* 2011; Volume 76 (Supplement 4)

Intraluminal and extraluminal extra-cranial structural and functional venous abnormalities in multiple sclerosis patients and healthy controls.

Zivadinov R, Dolic K, Marr K, Valnarov V, Dwyer MG, Carl E, Karmon Y, Kennedy C, Brooks C, Kilanowski C, Hunt K, Hojnacki D, Weinstock-Guttman B. 1st Congress of International Society for Neurovascular Disease. Bologna, Italy, March 15, 2011.

Hypoperfusion of brain parenchyma in CCSVI. 1st Congress of International Society for Neurovascular Disease.

Zivadinov R. Bologna, Italy, March 15, 2011.

Iron and veins in multiple sclerosis.

Zivadinov R. 1st Congress of International Society for Neurovascular Disease. Bologna, Italy, March 14, 2011.

The limits of magnetic resonance venography for diagnosis of chronic cerebrospinal venous insufficiency.

Zivadinov R. 1st Congress of International Society for Neurovascular Disease. Bologna, Italy, March 14, 2011.

Presence and severity of chronic cerebrospinal venous insufficiency is related to lower brain parenchyma venous vasculature visibility on susceptibility-weighted imaging in patients with multiple sclerosis.

Zivadinov R, Poloni G, Schirda C, Magnano C, Carl E, Bergsland N, Hojnacki D, Kennedy C, Parker F, Dwyer M, Weinstock-Guttman B. *Multiple Sclerosis* 2010; Volume 16 (Supplement 10).

Associations of HLA DR*1501 status and chronic cerebrospinal venous insufficiency in multiple sclerosis.

Weinstock-Guttman B, Zivadinov R, Cutter G, Tamano-Blanco M, Badgett D, Marr K, Carl E, Elfadil M, Kennedy C, Ramanathan M. *Multiple Sclerosis* 2010; Volume 16 (Supplement 10).

MRI results of blinded chronic cerebrospinal venous insufficiency study in patients with multiple sclerosis, healthy controls and patients with other neurologic diseases.

Zivadinov R, Cutter G, Marr K, Ramanathan M, Benedict RHB, Elfadil M, Bergsland N, Morgan C, Carl E, Hojnacki D, Yeh E, Willis L, Cherneva M, Hussein S, Durfee J, Kennedy C, Dwyer M, Weinstock-Guttman B. *Multiple Sclerosis* 2010; Volume 16 (Supplement 10).

Increased iron concentration and decreased volume of deep-grey matter are associated with increased disability in patients with multiple sclerosis.

Zivadinov R, Heininen-Brown M, Schirda C, Bergsland N, Magnano C, Hojnacki D, Ramasamy DP, Kennedy C, Carl E, Dwyer M, Weinstock-Guttman B. *Multiple Sclerosis* 2010; Volume 16 (Supplement 10)

Relation between quantitative venous vasculature assessment on susceptibility-weighted imaging and haemodynamic MRI metrics in multiple sclerosis patients.

Poloni G, Dwyer M, Parker F, Magnano C, Schirda C, Bergsland N, Zivadinov R. Multiple Sclerosis 2010: Volume 16 (Supplement 10)

Endovascular treatment for chronic cerebrospinal venous insufficiency in multiple sclerosis. A longitudinal pilot study.

Zamboni P, Galeotti R, Weinstock-Guttman B, Cutter G, Menegatti E, Malagoni AM, Hojnacki D, Cox JL, Kennedy C, Bartolomei I, Salvi F, Zivadinov R. Multiple Sclerosis 2009 Volume 15 (Supplement 2)

Clinical correlates of chronic cerebrospinal venous insufficiency in multiple sclerosis.

Weinstock-Guttman B, Cutter G, Marr K, Hojnacki D., Ramanathan M, Benedict RHB, Morgan C, Yeh EA, Carl E, Kennedy C, Reuther J, Brooks C, Elfadil M, Andrews, M, Zivadinov R. Multiple Sclerosis 2010: Volume 16 (Supplement 10)

Increased iron concentration on susceptibility-weighted imaging is associated with decreased deep-grey matter volumes in patients with multiple sclerosis.

Zivadinov R, Schirda C, Heininen-Brown M, Bergsland N, Magnano C, Durfee J, Kennedy C, Carl E, Hojnacki D, Weinstock-Guttman B, Dwyer M. Multiple Sclerosis 2010: Volume 16 (Supplement 10)

Use of magnetic resonance venography for visualisation of the internal jugular veins in patients with multiple sclerosis diagnosed with chronic cerebrospinal venous insufficiency and treated with percutaneous angioplasty.

Lopez-Soriano A, Zivadinov R, Galeotti R, Hojnacki D, Menegatti E, Schirda C, Malagoni AM, Marr K, Kennedy C, Bartolomei I, Magnano C, Salvi F, Weinstock-Guttman B, Zamboni P. Multiple Sclerosis 2010: Volume 16 (Supplement 10)

Multiple sclerosis patients with chronic cerebrospinal venous insufficiency present with increased iron concentration on susceptibility-weighted imaging in deep-grey matter.

Zivadinov R, Heininen-Brown M, Schirda C, Magnano C, Hojnacki D, Kennedy C, Carl E, Bergsland N, Hussein S, Cherneva M, Willis L, Dwyer M, Weinstock-Guttman B. Multiple Sclerosis 2010: Volume 16 (Supplement 10).

Relation between quantitative venous vasculature assessment on susceptibility-weighted imaging and conventional magnetic resonance metrics in multiple sclerosis patients.

Poloni G, Dwyer M, Parker F, Magnano C, Schirda C, Bergsland N, Zivadinov R. Multiple Sclerosis 2010: Volume 16 (Supplement 10)

Hypoperfusion of brain parenchyma is strongly associated with the severity of chronic cerebrospinal venous insufficiency in patients with multiple sclerosis.

Zamboni P, Menegatti E, Weinstock-Guttman B, Dwyer MG, Schirda C, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Bergsland N, Magnano C, Bartolomei I, Salvi F, Zivadinov R. Neurology 2010; Volume 74 (Supplement 2).

Chronic cerebrospinal venous insufficiency and iron deposition on susceptibility-weighted imaging in patients with multiple sclerosis.

Dwyer MG, Zamboni P, Haacke EM, Menegatti E, Weinstock-Guttman B, Schirda C, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Bergsland N, Hussein S, Heininen-Brown M, Bartolomei I, Salvi F, Zivadinov R. Neurology 2010; Volume 74 (Supplement 2).

Quantitative venous vasculature assessment on susceptibility-weighted imaging reflects presence of severe chronic venous insufficiency in the brain parenchyma of multiple sclerosis patients. A case-control study.

Poloni GU, Zamboni P, Haacke EM, Bastianello S, Dwyer MG, Bergsland N, Schirda C, Wack D, Magnano C, Weinstock-Guttman B, Salvi F, Hojnacki D, Zivadinov R. Neurology 2010; Volume 74 (Supplement 2).

Cine cerebrospinal fluid imaging in multiple sclerosis. A case-control study.

Zivadinov R, Magnano C, Weinstock-Guttman B, Wack D, Lindzen E, Hojnacki D, Bergsland N, Kennedy C, Reuther J, Dwyer MG, Schirda C. Proceedings of the Society for Magnetic Resonance Medicine 2010

Use of magnetic resonance venography for characterization of extracranial venous system in patients with multiple sclerosis and in normal controls. A blinded controlled study

Zivadinov R, Lopez A, Weinstock-Guttman B, Schirda C, Magnano C, Kennedy C, Brooks C, Reuther J, Hunt K, Andrews M, Hojnacki D. Proceedings of the Society for Magnetic Resonance Medicine 2010

A three-dimensional multi-scale line filter algorithm for segmentation of vein vessels in susceptibility weighted images.

Poloni GU, Dwyer MG, Bergsland N, Schirda C, Bastianello S, Zivadinov R. Proceedings of the Society for Magnetic Resonance Medicine 2010

An objective quantification technique of the cerebrospinal fluid (CSF) flow in the cerebral aqueduct, in patients with multiple sclerosis.

Schirda C, Zamboni P, Magnano C, Lindzen E, Wack D, Weinstock-Guttman B, Ramasamy D, Carl E, Hojnacki D, Kennedy C, Dwyer MG, Bergsland N, Cox JL, Salvi F, Zivadinov R. Proceedings of the Society for Magnetic Resonance Medicine 2010

Quantitative venous vasculature assessment on susceptibility-weighted imaging reflects presence of severe chronic venous insufficiency in the brain parenchyma of multiple sclerosis patients. A case-control study.

Poloni GU, Zamboni P, Haacke EM, Bastianello S, Dwyer MG, Bergsland N, Schirda C, Wack D, Magnano C, Weinstock-Guttman B, Salvi F, Hojnacki D, Zivadinov R. Neurology 2010; Volume 74 (Supplement 2).

Objective quantification of cerebrospinal fluid (CSF) flow rate in cerebral aqueduct in patients with multiple sclerosis

Schirda C, Zamboni P, Magnano C, Lindzen E, Wack D, Weinstock-Guttman B, Ramasamy D, Carl E, Hojnacki D, Kennedy C, Dwyer MG, Bergsland N, Cox JL, Salvi F, Zivadinov R. Neurology 2010; Volume 74 (Supplement 2).

Combined transcranial and extracranial venous doppler evaluation (CTEVD study).

Description of the design and interim results of an epidemiological study of the prevalence of chronic cerebrospinal venous insufficiency in MS and related diseases.

Zivadinov R, Marr K, Ramanathan M, Zamboni P, Benedict RHB, Cutter G, Kennedy C, Elfadil M, Hojnacki D, Munschauer FE, Reuther J, Brooks C, Hunt K, Andrews M, Weinstock-Guttman B. Neurology 2010; Volume 74 (Supplement 2).

Cine cerebrospinal fluid imaging in multiple sclerosis. A case-control study.

Magnano C, Schirda C, Weinstock-Guttman B, Wack D, Lindzen E, Hojnacki D, Bergsland N, Kennedy C, Reuther J, Dwyer MG, Zivadinov R. Neurology 2010; Volume 74 (Supplement 2)

Hypoperfusion of brain parenchyma is strongly associated with the severity of chronic cerebrospinal venous insufficiency in patients with multiple sclerosis.

Zamboni P, Menegatti E, Weinstock-Guttman B, Dwyer MG, Schirda C, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Bergsland N, Magnano C, Bartolomei I, Salvi F, Zivadinov R. Neurology 2010; Volume 74 (Supplement 2).

Chronic cerebrospinal venous insufficiency and iron deposition on susceptibility-weighted imaging in patients with multiple sclerosis.

Dwyer MG, Zamboni P, Haacke EM, Menegatti E, Weinstock-Guttman B, Schirda C, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Bergsland N, Hussein S, Heininen-Brown M, Bartolomei I, Salvi F, Zivadinov R. Neurology 2010; Volume 74 (Supplement 2).

Chronic cerebrospinal venous insufficiency is related to inverted and decreased cerebrospinal fluid flow and greater brain atrophy in patients with multiple sclerosis.

Zamboni P, Menegatti E, Weinstock-Guttman B, Cox JL, Claudiu S, Malagoni AM, Hojnacki D, Kennedy C, Carl E, Dwyer MG, Bergsland N, Galeotti R, Hussein S, Bartolomei I, Salvi F, Zivadinov R. Multiple Sclerosis 2009 Volume 15 (Supplement 2)

Endovascular treatment for chronic cerebrospinal venous insufficiency in multiple sclerosis. A longitudinal pilot study.

Zamboni P, Galeotti R, Weinstock-Guttman B, Cutter G, Menegatti E, Malagoni AM, Hojnacki D, Cox JL, Kennedy C, Bartolomei I, Salvi F, Zivadinov R. Multiple Sclerosis 2009 Volume 15 (Supplement 2)

LINKS TO JOURNALS

American Journal of Neuroradiology

<http://www.ajnr.org/>

Annals of Neurology

<http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291531-8249>

BMC Medicine

<http://www.biomedcentral.com/bmcmed/>

European Journal of Vascular and Endovascular Surgery

<http://www.sciencedirect.com/esvs>

Functional Neurology

<http://www.functionalneurology.it/>

International Angiology

<http://www.minervamedica.it/en/journals/international-angiology/index.php>

International Society for Neurovascular Disease

<http://www.isnvd.org/>

Multiple Sclerosis

<http://msj.sagepub.com/>

Neurology

<http://www.neurology.org/>

PLoS

<http://www.plos.org/>

Proceedings of the Society for Magnetic Resonance Medicine

<http://www.ismrm.org/>

PubMed

www.pubmed.com

Radiology

<http://radiology.rsna.org/>