

**Supplement Table 1.** Associations between the blood flow in each arterial pathway and the cognitive performance in multiple sclerosis patients and healthy controls.

			SDMT	CVLT-II	BVMT-R
HC	Right CCA	r-value	0.155	0.173	0.209
		p-value	0.309	0.257	0.169
	Left CCA	r-value	0.068	-0.104	0.085
		p-value	0.658	0.497	0.579
	Right VA	r-value	-0.033	0.147	0.128
		p-value	0.827	0.337	0.401
	Left VA	r-value	-0.137	-0.286	-0.038
		p-value	0.370	0.057	0.806
MS	Right CCA	r-value	<b>0.297</b>	0.065	0.173
		p-value	<b>0.001</b>	0.446	0.052
	Left CCA	r-value	<b>0.226</b>	0.049	<b>0.227</b>
		p-value	<b>0.011</b>	0.583	<b>0.010</b>
	Right VA	r-value	0.084	0.084	0.082
		p-value	0.349	0.348	0.359
	Left VA	r-value	<b>0.213</b>	0.110	0.167
		p-value	<b>0.016</b>	0.218	0.060

Legend: HC – healthy control, MS – multiple sclerosis, CCA – common carotid artery, VA – vertebral artery, SDMT – Symbol Digit Modalities test, CVLT-II – California Verbal Learning Test – Second Edition, BVMT-R – Brief Visuospatial Memory Test - Revised. Partial correlations adjusted for age and years of education were used. A p-value lower than 0.05 was considered significant and marked in bold.

**Supplement Table 2.** Regression models explaining the variance of SDMT and BVMT-R performance.

		SDMT				
		R <sup>2</sup>	Adj R <sup>2</sup>	t-statistics	Standardized B	p-value
Block 1		0.292	0.261			
Sex				-0.781	-0.062	0.437
Patients' age				-1.457	-0.138	0.148
Years of education				1.064	0.083	0.289
T2 - lesion volume				-2.666	-0.223	<b>0.009</b>
Gray matter volume				2.714	0.279	<b>0.008</b>
Block 2						
Additional variable: total CABF		0.331	0.295	2.538	0.203	<b>0.013</b>

  

		BVMT-R				
		R <sup>2</sup>	Adj R <sup>2</sup>	t-statistics	Standardized B	p-value
Block 1		0.188	0.152			
Sex				0.881	0.069	0.419
Patients' age				-0.962	-0.098	0.338
Years of education				1.174	0.099	0.243
T2 – lesion volume				-1.589	-0.144	0.115
Gray matter volume				2.259	0.250	<b>0.026</b>
Block 2						
Additional variable: total CABF		0.222	0.180	2.206	0.191	<b>0.029</b>

Legend: SDMT – Symbol Digit Modalities Test, BVMT-R – Brief Visuospatial Memory test, CABF – cerebral arterial blood flow.

The regression model is composed of two blocks. The first block forced entry of variables regardless of whether or not they provided significant contributions in the model. The block 2 consisted of only total CABF and was included only if total CABF provided additional explanatory variance. P-values <0.05 were considered significant and are shown in bold and demonstrate the significance of the contributing variable in the regression model. The post-hoc Supplement Table 2 was not included in the overall Benjamini-Hochberg correction provided for the manuscript.