

Supplementary Table 1. MSP characteristics

	MSP-normal	MSP-slow	<i>p</i> -value
Demographics			
Age (years)	45.90 (10.81)	48.18 (10.86)	0.576
Sex (% Female)	61.90	45.45	0.373 ^a
Education (years)	16.40 (2.80)	15.45 (2.21)	0.342
Brain Parenchymal Fraction (%)	72.72 (6.06)	66.59 (4.61)	0.006
Patient characteristics			
Disease Duration (years)	8.28 (5.98)	15.00 (9.43)	0.029
Lesion volume (mL)	3.21 (2.83)	15.84 (13.01)	0.009
EDSS	2.56 (1.50)	4.55 (1.88)	0.005
Modified Fatigue Impact Scale (MFIS)	36.24 (15.24)	47.20 (12.60)	0.058
Task performance			
Button-press frequency (Hz)	1.90 (0.07)	1.95 (0.06)	0.130
Nine-Hole-Peg Test (sec)	20.28 (1.81)	33.22 (8.39)	<0.001

^a Pearson chi-squared test

Supplemental Table 2. Mean (standard deviation) values from (top) healthy controls (HC) and MS patients (MSP) in the task-central and task-surround ROIs and (bottom) MSP-normal and MS-slow. Levene's test and t-tests were performed with p -values displayed. M is derived from the M1 ROI and used in the CMRO₂ calculation.

	HC	MSP	Levene's p -value	T -test p -value
M	0.085 (0.06)	0.062 (0.03)	0.018	0.152
Task-central ROI				
Δ BOLD (%)	0.639 (0.21)	0.735 (0.34)	0.104	0.295
Δ CBF (%)	33.63 (10.13)	51.51(27.87)	0.003	0.002
Δ CMRO ₂ (%)	10.54 (12.80)	19.79 (17.13)	0.279	0.039
# of voxels	5597.00 (3253.59)	5014.84 (3942.79)	0.578	0.605
Task-surround ROI				
Δ BOLD (%)	0.099 (0.17)	0.099 (0.33)	0.175	0.997
Δ CBF (%)	8.37 (6.04)	6.96 (12.88)	0.027	0.605
Δ CMRO ₂ (%)	3.71 (7.60)	3.38 (11.20)	0.231	0.914
# of voxels	45835.35 (3967.29)	46239.13 (6137.46)	0.074	0.808
	MSP-normal	MSP-slow		
Task-central ROI				
Δ BOLD (%)	0.815 (0.363)	0.583 (0.229)	0.207	0.065
Δ CBF (%)	54.03 (28.95)	46.71 (26.32)	0.700	0.490
Δ CMRO ₂ (%)	20.57 (18.76)	18.30 (14.23)	0.708	0.728
Task-surround ROI				
Δ BOLD (%)	0.105 (0.369)	0.087 (0.252)	0.505	0.890
Δ CBF (%)	10.74 (13.53)	-0.26 (7.78)	0.136	0.019
Δ CMRO ₂ (%)	5.95 (11.36)	-1.52 (9.49)	0.359	0.072

Supplemental Table 3. Mean (standard deviation) values from (top) healthy controls (HC) and MS patients (MSP) in the task-negative ($T < -1.96$) ROIs and (bottom) MSP-normal and MS-slow. Levene's test and t-tests were performed with p -values displayed.

	HC ($n = 13$)	MSP ($n = 25$)	Levene's p -value	T -test p -value
M	0.107 (0.07)	0.088 (0.05)	0.045	0.355
Task-negative ROI				
Δ BOLD (%)	-0.469 (0.32)	-0.993 (1.96)	0.190	0.348
Δ CBF (%)	-34.88 (33.38)	-56.50 (93.53)	0.392	0.427
Δ CMRO ₂ (%)	-25.52 (33.86)	-35.19 (55.70)	0.545	0.571
# of voxels	469.23 (649.80)	552.32 (631.72)	0.904	0.705
	MSP-normal ($n = 16$)	MSP-slow ($n = 9$)		
Task-negative ROI				
Δ BOLD (%)	-1.22 (2.43)	-0.60 (0.49)	0.236	0.462
Δ CBF (%)	-69.38 (115.73)	-33.61 (14.45)	0.112	0.370
Δ CMRO ₂ (%)	-43.70 (68.15)	-20.07 (14.09)	0.066	0.319
# of voxels	459.69 (726.50)	717.00 (399.87)	0.373	0.339