

Supplemental Table 1: Δ RBANS Total Scale Score Regression Analysis

Univariable Regression	β coefficient	95% CI	P
ΔRBANS Total Scale Score			
Participant Characteristics			
Male	-6.02	-19.41, 7.37	.36
Age, years	-0.43	-1.12, 0.27	.22
BMI, kg/m ²	-0.07	-0.61, 0.48	.80
Right Handedness	1.53	-9.88, 12.95	.78
Co-Morbidities			
Hyperlipidemia	-11.24	-19.06, -3.43	.007
Hypertension	2.37	-5.44, 10.19	.54
Current Smoker	3.93	-6.07, 13.95	.42
Prior Smoker	-0.73	-8.61, 7.15	.85
Diabetes	2.79	-4.82, 10.39	.45
AHA Stroke	-2.67	-10.95, 5.61	.51
Post-Intervention Stroke *	-	-	-
Renal Insufficiency	-8.36	-26.86, 10.13	.36
Medications			
Statin	0.30	-9.86, 10.46	.95
Antihypertensive	-0.35	-8.12, 7.41	.93
Antiplatelet	3.26	-4.69, 11.21	.40
Anticoagulation	-11.88	-22.97, -1.80	.02

Intervened Plaque Features			
IPH	-8.36	-15.07, -1.65	.02
Ulceration	0.00	-7.71, 7.71	1.00
Max Plaque Thickness, mm	-0.21	-2.77, 2.24	.86
NASCET, %	6.05	-14.62, 26.72	.61
Intraluminal Thrombus *	-	-	-
Contralateral Plaque Features			
Contra-IPH	4.60	-4.50, 13.70	.31
Contra-Ulceration	-0.17	-7.88, 7.53	.96
Contra-Max Plaque Thickness, mm	0.82	-1.65, 3.29	.50
Contra-NASCET, %	6.05	-14.62, 26.72	.57
Contra-Intraluminal Thrombus *	-	-	-
Carotid Intervention			
Carotid Endarterectomy	-3.83	-15.13, 7.47	.49
Right Sided Intervention	-4.75	-12.34, 2.84	.21
White Matter Disease			
Age-related White Matter Changes	0.41	-5.42, 6.37	.89
Perfusion			
CBF ACA	0.28	-0.26, 0.81	.30
CBF MCA	0.42	0.01, 0.8	.04
CBF PCA	0.41	-0.05, 0.86	.08
CBF Total	0.44	-0.03, 0.91	.07
CBV ACA	0.92	-3.77, 5.62	.69

CBV MCA	2.66	-0.35, 5.66	.08
CBV PCA	2.60	-1.35, 6.55	.19
CBV Total	2.20	-1.99, 6.39	.29
MTT ACA	-0.75	-2.73, 1.23	.44
MTT MCA	-0.22	-2.39, 1.95	.84
MTT PCA	.04	-3.10, 3.18	.98
MTT Total	-0.91	-3.20, 1.39	.42
CBF ACA Ratio	-9.75	-52.81, 33.31	.64
CBF MCA Ratio	13.64	-29.41, 56.69	.52
CBF PCA Ratio	1.21	-38.0, 3 40.44	.95
CBF Total Ratio	4.01	-60.09, 68.11	.90
CBV ACA Ratio	-13.89	-42.51, 14.74	.32
CBV MCA Ratio	-0.24	-30.25, 29.77	.99
CBV PCA Ratio	4.67	-35.71, 45.05	.81
CBV Total Ratio	-8.52	-53.16, 36.12	.79
MTT ACA Ratio	-29.34	-66.19, 7.51	.11
MTT MCA Ratio	-35.13	-91.04, 20.78	.21
MTT PCA Ratio	13.04	-10.35, 36.43	.26
MTT Total Ratio	-7.89	-67.44, 51.67	.79
RBANS Testing			
Education, years	.172	-1.30, 1.64	.81
Intervention to RBANS-2, days	.004	-0.01, 0.02	.55
RBANS-1 Cognitive Impairment	0.46	-0.52, 1.44	.26

Multivariable Regression	β coefficient	95% CI	P
ΔRBANS Total Scale Score			
Co-Variates P<.20 Univariable Regression			
MTT ACA Ratio	1.32	-40.83, 43.47	.95
CBV PCA	1.23	-8.90, 11.37	.80
CBF PCA	-0.29	-1.87, 1.28	.70
CBF Total	0.25	-1.20, 1.71	.72
CBF MCA	-0.33	-1.00, 0.34	.31
Anticoagulation	-4.90	-14.99, 5.20	.32
CBV MCA **	2.10	-0.38, 4.57	.09
Final Model Remaining Co-Variates P<.10			
IPH	-6.17	-12.49, 0.15	.055
Hyperlipidemia	-9.05	-16.70, -1.40	.02

Supplemental Table 2: Δ RBANS Attention Index Regression Analysis

Univariable Regression	β coefficient	95% CI	P
ΔRBANS Attention Index			
Participant Characteristics			
Male	-4.45	-22.37, 13.46	.61
Age, years	-0.64	-1.55, 0.26	.20
BMI, kg/m ²	0.14	-0.57, 0.86	.68
Right Handedness	0.88	-14.19, 15.96	.90
Co-Morbidities			
Hyperlipidemia	-10.17	-21.59, 1.24	.08
Hypertension	3.45	-6.84, 13.74	.49
Current Smoker	1.29	-12.10, 14.68	.84
Prior Smoker	4.73	-5.45, 14.91	.35
Diabetes	3.70	-6.33, 13.73	.45
AHA Stroke	-1.04	-12.07, 9.99	.85
Post-Intervention Stroke *	-	-	-
Renal Insufficiency	-9.86	-34.37, 14.64	.41
Medications			
Statin	-0.99	-14.38, 12.41	.88
Antihypertensive	0.06	-10.19, 10.31	.99
Antiplatelet	0.09	-10.57, 10.76	.99
Anticoagulation	-13.92	-27.61, -0.22	.047

Ipsilateral Plaque Features			
IPH	-10.24	-19.29, -1.20	.03
Ulceration	2.40	-7.71, 12.51	.63
Max Plaque Thickness, mm	-1.72	-4.85, 1.42	.27
NASCET, %	8.21	-19.04, 35.47	.54
Intraluminal Thrombus *	-	-	-
Contralateral Plaque Features			
Contra-IPH	4.81	-7.31, 16.93	.42
Contra-Ulceration	2.13	-7.99, 12.25	.67
Contra-Max Plaque Thickness, mm	1.25	-1.99, 4.50	.43
Contra-NASCET, %	10.16	-6.11, 26.42	.21
Contra-Intraluminal Thrombus *	-	-	-
Carotid Intervention			
Carotid Endarterectomy	2.42	-12.63, 17.46	.74
Right Sided Intervention	-4.58	-14.78, 5.62	.36
White Matter Disease			
Age-related White Matter Changes	0.92	-6.98, 8.83	.81
Perfusion			
CBF ACA	0.18	-0.54, 0.90	.60
CBF MCA	0.23	-0.36, 0.82	.42
CBF PCA	0.31	-0.32, 0.94	.32
CBF Total	0.31	-0.35, 0.96	.35
CBV ACA	-1.64	-7.81, 4.53	.59

CBV MCA	0.39	-3.88, 4.65	.85
CBV PCA	0.45	-4.99, 5.88	.87
CBV Total	-0.76	-6.42, 4.91	.78
MTT ACA	-1.57	-4.12, 0.99	.22
MTT MCA	-0.86	-3.70, 1.98	.54
MTT PCA	-1.27	-5.37, 2.83	.53
MTT Total	-1.88	-4.84, 1.08	.20
CBF ACA Ratio	-19.90	-76.29, 36.48	.47
CBF MCA Ratio	-15.16	-72.11, 41.80	.59
CBF PCA Ratio	14.54	-36.80, 65.87	.56
CBF Total Ratio	-12.32	-96.73, 72.08	.76
CBV ACA Ratio	-27.03	-63.70, 9.63	.14
CBV MCA Ratio	-11.86	-51.08, 27.36	.54
CBV PCA Ratio	-0.88	-54.21, 52.46	.97
CBV Total Ratio	-29.36	-86.94, 28.22	.30
MTT ACA Ratio	-51.28	-97.42, -5.13	.03
MTT MCA Ratio	-25.46	-101.28, 50.36	.49
MTT PCA Ratio	7.76	-23.87, 39.39	.62
MTT Total Ratio	-31.93	-109.28, 45.42	.40
RBANS Testing			
Education, years	0.83	-1.08, 2.73	.38
RBANS-1 Cognitive Impairment	0.11	-1.31, 1.53	.84
Intervention to RBANS-2, days	-0.00005	-0.02060, 0.01964	.96

Multivariable Regression	β coefficient	95% CI	P
ΔRBANS Attention Index			
Covariates P<.20 Univariable Regression			
Age	-0.11	-1.28, 1.07	.85
CBV ACA Ratio	9.49	-47.00, 65.99	.73
MTT ACA Ratio	-26.90	-78.98, 25.18	.29
HLD	-6.51	-17.75, 4.74	.24
Anticoagulation	-9.29	-23.73, 5.15	.20
Final Model Remaining Covariates P<.10			
IPH	-10.24	-19.29, -1.20	.03

Supplemental Table 3: Δ RBANS Immediate Memory Regression Analysis

Univariable Regression	β coefficient	95% CI	P
ΔRBANS Immediate Memory Index			
Participant Characteristics			
Male	-17.69	-30.15, -5.23	.008
Age, years	-0.36	-1.12, 0.41	.34
BMI, kg/m ²	0.37	-0.20, 0.93	.19
Right Handedness	0.02	-12.38, 12.42	1.00
Co-Morbidities			
Hyperlipidemia	-6.46	-16.15, 3.23	.18
Hypertension	2.94	-5.51, 11.40	.48
Current Smoker	-0.12	-11.13, 10.90	.98
Prior Smoker	2.40	-6.09, 10.88	.56
Diabetes	-1.02	-9.36, 7.33	.80
AHA Stroke	0.94	-8.13, 10.00	.83
Post-Intervention Stroke *	-	-	-
Renal Insufficiency	-10.82	-30.70, 9.10	.27
Medications			
Statin	2.84	-8.10, 13.78	.60
Antihypertensive	3.09	-5.21, 11.40	.45
Antiplatelet	1.88	-6.85, 10.60	.66
Anticoagulation	1.90	-10.47, 14.27	.75

Ipsilateral Plaque Features			
IPH	-7.98	-15.52, -0.45	.04
Ulceration	-4.73	-12.81, 3.34	.24
Max Plaque Thickness, mm	-1.37	-3.95, 1.22	.28
NASCET, %	5.93	-16.52, 28.38	.59
Intraluminal Thrombus *	-	-	-
Contralateral Plaque Features			
Contra-IPH	-3.26	-13.27, 6.76	.51
Contra-Ulceration	-3.63	-11.82, 4.57	.37
Contra-Max Plaque Thickness, mm	-0.58	-3.27, 2.12	.66
Contra-NASCET, %	5.93	-16.52, 28.38	.59
Contra-Intraluminal Thrombus *	-	-	-
Carotid Intervention			
Carotid Endarterectomy	-5.35	-17.51, 6.81	.37
Right Sided Intervention	1.12	-7.42, 9.66	.79
RBANS Testing			
Education, years	-0.10	-1.70, 1.49	.89
RBANS-1 Cognitive Impairment	-0.13	-1.68, 1.43	.83
Intervention to RBANS-2, days	0.005	-0.011, 0.022	.50
White Matter Disease			
Age-related White Matter Changes	4.67	-0.53, 9.86	.08
Perfusion			
CBF ACA	-0.17	-0.76, 0.42	.55

CBF MCA	-0.12	-0.61, 0.37	.62
CBF PCA	0.18	-0.35, 0.70	.50
CBF Total	-0.05	-0.61, 0.50	.84
CBV ACA	-2.96	-7.89, 1.97	.23
CBV MCA	-2.17	-5.54, 1.19	.19
CBV PCA	0.49	-3.98, 4.96	.82
CBV Total	-1.97	-6.55, 2.61	.38
MTT ACA	0.23	-1.95, 2.41	.83
MTT MCA	-0.26	-2.61, 2.10	.82
MTT PCA	-0.63	-4.03, 2.76	.70
MTT Total	-0.02	-2.56, 2.51	.98
CBF ACA Ratio	-12.98	-59.55, 33.59	.57
CBF MCA Ratio	-27.80	-73.24, 17.64	.22
CBF PCA Ratio	-2.51	-45.04, 40.02	.90
CBF Total Ratio	-32.54	-100.49, 35.41	.33
CBV ACA Ratio	-9.44	-40.93, 22.05	.54
CBV MCA Ratio	-24.98	-55.49, 5.52	.10
CBV PCA Ratio	-2.33	-46.16, 41.51	.91
CBV Total Ratio	-28.94	-75.71, 17.84	.21
MTT ACA Ratio	-20.07	-61.57, 21.42	.33
MTT MCA Ratio	-56.78	-114.32, 0.75	.05
MTT PCA Ratio	-12.70	-38.22, 12.81	.31
MTT Total Ratio	-63.31	-121.27, -5.35	.03

RBANS Testing			
Education, years	-0.10	-1.70, 1.49	.89
RBANS-1 Cognitive Impairment	-0.13	-1.68, 1.43	.83
Intervention to RBANS-2, days	0.005	-0.011, 0.022	.50
Multivariable Regression	β coefficient	95% CI	P
ΔRBANS Immediate Memory Index			
Covariates P<.20 Univariable Regression			
HLD	-2.42	-11.40, 6.57	.58
CBV MCA	-2.20	-5.76, 1.35	.21
Male	-12.59	-28.67, 3.50	.12
CBV MCA Ratio	24.38	-13.93, 62.68	.20
Final Model Remaining Covariates P<.10			
MTT Total Ratio	-48.51	-100.70, 3.69	.07
BMI	0.49	0.02, 0.97	.04
IPH	-8.17	-15.10, -1.24	.02

Notes

*P value not available due to collinearity or no events occurred in the groups

**Excluded because there was a less than 10% change observed in the β coefficient

Supplemental Table 4: Post-Intervention RBANS-2 Scores and IPH Status

RBANS	IPH(+) RBANS-1 n=11	IPH(+) RBANS-2 n=11	P	IPH(-) RBANS-1 n=12	IPH(-) RBANS-2 n=12	P	IPH(+) ΔRBANS n=11	IPH(-) ΔRBANS n=12	P
Total Scale	97.0±17.8	96.6±19.5	.86	86.4±11.8	95.5±12.4	.004	-0.4±6.8	8.0±8.5	.02
Attention	99.4±18.0	93.5±19.4	.045	84.3±7.7	89.8±14.0	.12	-5.9±8.5	4.3±11.9	.03
Immediate Memory	95.0±19.6	99.2±16.0	.06	82.3±14.6	96.2±14.1	.002	4.2±6.7	12.2±10.2	.04
Delayed Memory	96.2±19.1	96.9±22.4	.83	94.3±14.9	102.4±8.0	.03	0.7±11.2	5.9±11.0	.28
VS/CT	99.3±16.7	95.6± 18.8	.45	95.8±19.8	96.9±19.4	.81	-3.6±15.4	2.2±15.6	.38
Language	99.6±12.2	101.0±10.8	.61	91.4±7.6	94.8±8.2	.16	1.5±9.2	2.3±7.0	.82
Verbal	98.2±15.5	104.7±13.5	.07	94.3±13.2	101.5±107.4	.009	6.5±10.7	7.3±8.0	.86
Visual	97.8±19.8	95.7±15.2	.46	89.6±13.7	95.5±14.9	.15	-2.1±9.1	5.8±13.2	.11

VS/CT=Visuospatial/Constructional

Table 5: Observed and Predicted Post-Intervention RBANS Scores

RBANS	RBANS-2_{OB} n=23	RBANS-2_{PD} n=23	Group_{OB-PD} n=23	P	IPH(+)_{OB-PD} n=11	P	IPH(-)_{OB-PD} n=12	P
Total Scale	96.1±15.8	97.7±11.2	-1.5±8.7	.41	-4.5±8.7	.12	1.2±8.1	.61
Attention	91.3±16.4	97.6±9.7	-6.3±11.2	.01	-8.9±10.5	.02	-4.0±11.9	.27
Immediate Memory	97.7±14.9	102.7±0.6	-5.0±8.1	.007	-5.3±6.8	.03	-4.6±9.4	.12
Delayed Memory	99.6±16.3	102.2±11.6	-2.6±10.5	.24	-5.3±12.7	.19	-0.1±7.6	.95
VS/CT	96.9±18.8	103.9±7.2	-7.0±16.3	.051	-9.6±16.0	.07	-4.7±16.9	.36
Language	97.7±9.8	101.4±6.6	-3.7±6.7	.02	-2.0±7.1	.38	-5.2±6.1	.01

VS/CT=Visuospatial/Constructional

Group_{OB-PD}, **IPH(+)_{OB-PD}**, and **IPH(-)_{OB-PD}** = the subtracted RBANS-2_{OB} (observed) and RBANS-2_{PD} (predicted) post-interventional scores for the whole group and IPH groups