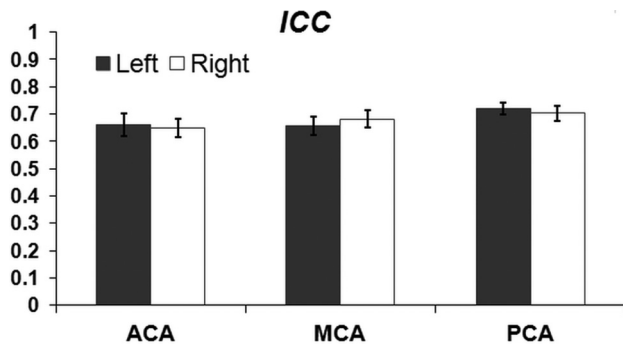


ON-LINE FIG 1. BH-CVR estimates of relative positive (f_{pos}) (A) and negative (f_{neg}) (B) voxel counts and their respective magnitudes (C and D) in 3 major vascular territories. Error bars represent standard errors. Upper row of each figure represents estimates from the left hemisphere, and the lower row represents estimates from the right hemisphere.



ON-LINE FIG 2. Intraclass correlation coefficient estimates among repeat BH-CVR scans across vascular territories in the left and the right hemispheres.

On-line Table 1: Patient demographics and corresponding repeatability metrics of BH-CVR studies

Patient ID	Age at Diagnosis (yr)		Sex	Moyamoya Classification	Clinical Presentation	Study No.	Age at CVR (yr)		BH Issues	GM		WM		Study Quality Using ICC ^b
	6.0	8.3					12.5	15.3		ICC (95% CI)	CV%	ICC (95% CI)	CV%	
P01	6.0	8.3	M	Familial	Stroke	1	12.5	15.3	NC	0.93 (0.92-0.93)	2.4	0.83 (0.81-0.85)	9.4	Excellent
P02	8.3	7.0	M	Neurofibromatosis type 1	Asymptomatic ^a	1	9.9	8.6	NC	0.74 (0.72-0.76)	1.27	0.67 (0.64-0.69)	4.41	Excellent
P03	7.0	5.5	M	SCD	Asymptomatic ^a	1	8.6	11.8	NC	0.51 (0.47-0.55)	15.49	0.55 (0.51-0.59)	23.44	Fair
P04	5.5	8.3	F	Idiopathic	TIA and headache	2	12.6	16.0	NC	0.80 (0.78-0.82)	0.10	0.74 (0.71-0.76)	9.8	Excellent
P05	8.3	6.0	F	Idiopathic	Headache	1	11.8	10.1	NC	0.82 (0.80-0.83)	2.3	0.84 (0.82-0.85)	8.10	Excellent
P06	6.0	10.0	M	Idiopathic	TIA	2	16.0	11.5	NC	0.92 (0.91-0.92)	1.0	0.91 (0.91-0.92)	2.0	Excellent
P07	10.0	9.0	M	Idiopathic	TIA	1	16.6	8.9	NC	0.89 (0.88-0.90)	3.16	0.88 (0.86-0.89)	1.11	Excellent
P08	9.0	8.0	M	Idiopathic	Stroke	1	11.5	13.2	NC	0.32 (0.27-0.36)	11.62	0.32 (0.27-0.36)	18.64	Poor
P09	8.0	6.0	F	Neurofibromatosis type 1	Asymptomatic ^a	1	14.0	14.3	NC	0.90 (0.89-0.91)	16.20	0.88 (0.87-0.90)	17.31	Excellent
P10	6.0	8.0	F	Idiopathic	TIA	2	16.0	16.4	NC	0.71 (0.69-0.73)	4.26	0.69 (0.66-0.72)	2.20	Good
P11	8.0	4.0	M	Idiopathic	Headache	3	8.9	12.1	NC	0.74 (0.72-0.76)	13.14	0.66 (0.63-0.69)	6.5	Good
P12	11.3	4.0	F	ACTA2	Asymptomatic	1	17.4	12.0	NC	0.83 (0.81-0.84)	9.17	0.79 (0.78-0.81)	0.9	Excellent
P13	4.0	10.3	F	Idiopathic	TIA	2	11.1	17.0	NC	0.61 (0.58-0.64)	7.18	0.59 (0.55-0.63)	4.17	Good
P14	10.3	6.0	F	SCD	Asymptomatic ^a	3	15.9	9.3	NC	0.81 (0.79-0.82)	0.14	0.83 (0.81-0.85)	3.11	Excellent
P15	6.0	9.0	F	Idiopathic	TIA	4	13.2	12.0	NC	0.73 (0.70-0.75)	9.14	0.77 (0.75-0.79)	3.9	Excellent
P16	9.0	7.5	M	Idiopathic	TIA	1	17.4	14.4	NC	0.33 (0.29-0.37)	5.10	0.43 (0.39-0.47)	9.15	Poor
P17	7.5	10.5	M	Neurofibromatosis type 1	Asymptomatic ^a	2	11.1	18.0	NC	0.79 (0.78-0.81)	10.2	0.82 (0.81-0.84)	10.6	Excellent
P18	10.5	1.4	F	Neurofibromatosis type 1	Headache	3	12.1	17.4	NC	0.82 (0.80-0.83)	7.8	0.85 (0.84-0.86)	11.18	Excellent
P19	1.4	16.8	M	Idiopathic	Stroke	4	13.2	14.4	NC	0.77 (0.75-0.79)	19.40	0.79 (0.77-0.81)	20.14	Excellent
P20	16.8	Mean (excluding NC and motion)	M	Radiation vasculopathy	Asymptomatic ^a	1	18.0	Mean (excluding NC and motion)	Mean (excluding NC and motion)	0.70 ± 0.19	9.1 ± 8.2	0.69 ± 0.20	8.6 ± 8.0	Excellent
Mean (excluding NC and motion)										0.77 ± 0.12	-22.5 ± 18.3	0.76 ± 0.12	-20 ± 17.1	
											7.6 ± 6.1		7.3 ± 6.3	
											-18.9 ± 13.8		-16.1 ± 12.1	

Note:—NC indicates noncompliant; Motion, excessive motion; ID, identification.

^aDiagnosis made following screening imaging study.

^bStudy quality based on whole-brain ICC.

On-line Table 2: Estimates of BH-CVR in 20 patients with 30 repeat scans (includes all follow-up studies)

Patient ID	Mean Magnitude						Mean Count						Mean Magnitude CVR (Positive and Negative Combined)							
	Positive CVR			Negative CVR			Positive CVR			Negative CVR			GM			WM				
	GM	WM		GM	WM		GM	WM		GM	WM		GM	WM		GM	WM			
	A	B	A	A	B	A	A	B	A	A	B	A	A	B	A	A	B	A	B	
P01	0.66	0.64	0.58	0.51	0.51	-0.55	-0.52	-0.33	0.38	0.40	0.44	0.44	0.43	0.42	0.55	0.54	0.02	0.04	0.06	0.05
P02	0.95	0.97	0.48	0.51	0.48	-0.29	-0.43	-0.31	0.71	0.61	0.76	0.58	0.13	0.24	0.23	0.41	0.64	0.49	0.33	0.17
P03	0.94	1.16	0.47	0.65	-0.44	-0.37	-0.76	-0.44	0.62	0.56	0.56	0.55	0.18	0.25	0.36	0.37	0.51	0.46	0.18	0.20
P04a	0.80	0.80	0.44	0.39	-0.17	-0.31	-0.27	-0.19	0.83	0.86	0.84	0.84	0.12	0.10	0.16	0.16	0.62	0.66	0.34	0.30
P04b	0.78	0.80	0.48	0.43	-0.43	-0.24	-0.25	-0.13	0.76	0.75	0.82	0.79	0.09	0.10	0.17	0.20	0.58	0.58	0.37	0.31
P05a	1.19	1.20	0.73	0.75	-0.28	-0.56	-0.56	-0.28	0.68	0.70	0.78	0.81	0.16	0.15	0.21	0.18	0.72	0.76	0.52	0.56
P05b	1.29	1.34	0.77	0.76	-0.43	-0.43	-0.54	-0.30	0.69	0.66	0.72	0.70	0.16	0.20	0.27	0.29	0.82	0.78	0.47	0.43
P06	0.81	0.95	0.50	0.65	-0.31	-0.31	-0.79	-0.22	0.57	0.41	0.65	0.46	0.26	0.40	0.32	0.52	0.39	0.07	0.25	0.00
P07	1.17	1.47	0.79	1.01	-0.31	-0.41	-0.41	-0.23	0.67	0.68	0.85	0.88	0.08	0.07	0.12	0.10	0.76	0.96	0.64	0.85
P08	0.56	0.59	0.45	0.46	-0.18	-0.18	-0.26	-0.15	0.69	0.68	0.74	0.73	0.17	0.17	0.23	0.23	0.36	0.36	0.30	0.29
P09-1	0.98	0.82	0.51	0.47	-0.36	-0.36	-0.44	-0.25	0.70	0.66	0.71	0.70	0.17	0.20	0.29	0.29	0.63	0.45	0.29	0.25
P09-2	1.09	1.24	0.54	0.54	-0.30	-0.30	-0.38	-0.21	0.75	0.76	0.80	0.80	0.13	0.12	0.19	0.20	0.78	0.90	0.39	0.39
P10-1	0.49	0.54	0.33	0.31	-0.20	-0.20	-0.26	-0.15	0.73	0.72	0.71	0.66	0.20	0.22	0.28	0.33	0.32	0.34	0.19	0.14
P10-2	0.58	0.58	0.42	0.40	-0.18	-0.18	-0.22	-0.12	0.72	0.71	0.79	0.79	0.11	0.12	0.19	0.19	0.40	0.39	0.31	0.29
P10-3	0.81	0.71	0.49	0.47	-0.39	-0.39	-0.32	-0.24	0.57	0.58	0.56	0.62	0.24	0.23	0.41	0.35	0.37	0.34	0.17	0.22
P11-1	1.09	1.02	0.72	0.63	-0.53	-0.53	-0.46	-0.31	0.65	0.69	0.78	0.75	0.16	0.15	0.21	0.24	0.63	0.63	0.50	0.41
P11-2	1.08	1.24	0.64	0.74	-0.41	-0.41	-0.40	-0.23	0.73	0.75	0.79	0.82	0.11	0.09	0.19	0.17	0.74	0.89	0.46	0.57
P11-3	1.25	1.39	0.79	0.92	-0.56	-0.56	-0.63	-0.31	0.72	0.74	0.85	0.91	0.11	0.09	0.13	0.07	0.84	0.97	0.63	0.81
P11-4	1.32	1.01	0.81	0.61	-0.52	-0.52	-0.29	-0.22	0.77	0.73	0.93	0.83	0.06	0.10	0.06	0.16	0.98	0.71	0.74	0.48
P12	1.17	1.05	0.70	0.65	-0.37	-0.37	-0.60	-0.25	0.70	0.65	0.81	0.73	0.13	0.18	0.17	0.25	0.78	0.57	0.53	0.39
P13-1	0.69	0.82	0.55	0.53	-0.37	-0.37	-0.52	-0.27	0.65	0.61	0.72	0.65	0.25	0.27	0.26	0.31	0.36	0.37	0.32	0.24
P13-2	0.84	0.91	0.67	0.70	-0.31	-0.31	-0.37	-0.22	0.55	0.58	0.69	0.72	0.20	0.18	0.25	0.22	0.40	0.46	0.41	0.45
P13-3	0.93	0.84	0.71	0.64	-0.38	-0.38	-0.31	-0.24	0.62	0.63	0.73	0.71	0.18	0.16	0.21	0.24	0.50	0.48	0.47	0.41
P14	1.23	0.96	0.70	0.58	-0.97	-0.97	-0.51	-0.50	0.54	0.69	0.58	0.75	0.34	0.19	0.41	0.24	0.34	0.56	0.20	0.37
P15	0.56	0.60	0.41	0.41	-0.29	-0.29	-0.43	-0.24	0.48	0.44	0.58	0.55	0.32	0.36	0.40	0.43	0.18	0.11	0.14	0.10
P16	0.65	0.87	0.52	0.66	-0.25	-0.25	-0.46	-0.20	0.63	0.57	0.73	0.67	0.19	0.25	0.26	0.32	0.36	0.39	0.33	0.34
P17	1.24	0.88	0.72	0.44	-1.26	-1.26	-0.39	-0.63	0.49	0.68	0.48	0.73	0.39	0.19	0.51	0.26	0.12	0.53	0.02	0.26
P18	1.03	1.02	0.53	0.55	-0.31	-0.31	-0.31	-0.20	0.75	0.75	0.78	0.78	0.11	0.10	0.21	0.21	0.74	0.74	0.37	0.39
P19	0.50	0.83	0.42	0.51	-0.32	-0.32	-0.55	-0.29	0.50	0.41	0.61	0.47	0.27	0.38	0.32	0.47	0.16	0.13	0.16	0.02
P20	1.75	1.64	0.97	0.98	-0.63	-0.63	-0.52	-0.28	0.75	0.74	0.81	0.83	0.10	0.10	0.17	0.15	1.24	1.17	0.73	0.78
Mean	0.95	0.96	0.59	0.60	-0.41	-0.41	-0.44	-0.25	0.65	0.65	0.72	0.71	0.18	0.19	0.26	0.27	0.54	0.54	0.36	0.35
SD	0.30	0.28	0.15	0.17	0.23	0.23	0.15	0.10	0.10	0.11	0.12	0.12	0.09	0.10	0.11	0.12	0.27	0.28	0.18	0.21