

Table E1. Summary of MRI acquisition parameters

	Single-delay ASL	Multidelay ASL (Hadamard encoding)	T1 W	T2-FLAIR	Phase-Contrast angiography
Sequence	three-dimensional fast spin echo with spiral readout	three-dimensional fast spin echo with spiral readout	three-dimensional fast spoiled gradient echo	2-D spin echo	Cardiac gated fast low-angle gradient echo
Repetition time (ms)	4854	6891	9.6	9500	12.4
Echo time (ms)	10.7	22.7	3.8	140	4.6
Inversion time (ms)	—	—	400	2300	—
Flip angle (degree)	—	—	13	111	20
Label duration (ms)	1450	1700	—	—	—
Postlabel delay (ms)	2025	300, 2000, 3700 (effective postlabel delay)	—	—	—
In plane resolution (mm)	3.73	5.77	0.94	0.47	0.375
Slice thickness (mm)	4.0	4.0	1.0	5.0	3.0
Number of averages	3	2	1	1	2
Encoding velocity (cm/s)	No vascular crushing	4	—	—	100
Spiral number of arms	8	4	—	—	—
Points/arm	512	512	—	—	—
Acquisition time (min)	4:13	4:47	3:36	2:23	1:30

Note.—ASL = arterial spin labeling, T1 W = T1 weighted image, T2-FLAIR = T2 weighted fluid-attenuated inversion recovery image.

Table E2. Image quality metrics of model predictions and relative cerebral blood flow change measured by arterial spin labeling.

Patients with Moyamoya Disease (<i>n</i> = 24)												
	RMSE				PSNR				SSIM			
	Mean	STD	Friedman test	Post hoc*	Mean	STD	Friedman test	Post hoc*	Mean	STD	Friedman test	Post hoc*
PET-plus-MRI	0.142	0.032	$p < 0.001$	^a $P < .001$	21.6	1.2	$p < 0.001$	^a $P < .001$	0.590	0.073	$p < 0.001$	^a $P < .001$
MRI-only	0.144	0.034		^b $P < .001$	21.5	1.4		^b $P < .001$	0.572	0.074		^b $P < .001$
ASL-rΔCBF	0.370	0.205		^c $P = .39$	14.2	4.9		^c $P = .39$	0.253	0.163		^c $P = .25$
Healthy Controls (<i>n</i> = 12)												
	RMSE				PSNR				SSIM			
Model	Mean	STD	Friedman test	Post hoc*	Mean	STD	Friedman test	Post hoc	Mean	STD	Friedman test	Post hoc*
PET-plus-MRI	0.126	0.024	$p < 0.001$	^a $P = .003$	22.9	0.7	$p = 0.005$	^a $P < .001$	0.633	0.086	$p < 0.001$	^a $P < .001$
MRI-only	0.136	0.017		^b $P = .31$	22.1	0.7		^b $P = .10$	0.613	0.068		^b $P = .004$
ASL-rΔCBF	0.217	0.115		^c $P = .31$	19.0	3.9		^c $P = .10$	0.416	0.174		^c $P = .10$

Note.—ASL-rΔCBF = relative cerebral blood flow change measured by multidelay arterial spin labeling, PSNR = peak signal-to-noise ratio, RMSE = root mean squared error, SSIM = structural similarity index, STD = standard deviation.

* Post hoc test is performed by Dunn's multiple comparison test.

^a Indicates PET-plus-MRI versus ASL-rΔCBF.

^b Indicates MRI-only versus ASL-rΔCBF.

^c Indicates PET-plus-MRI versus MRI-only.