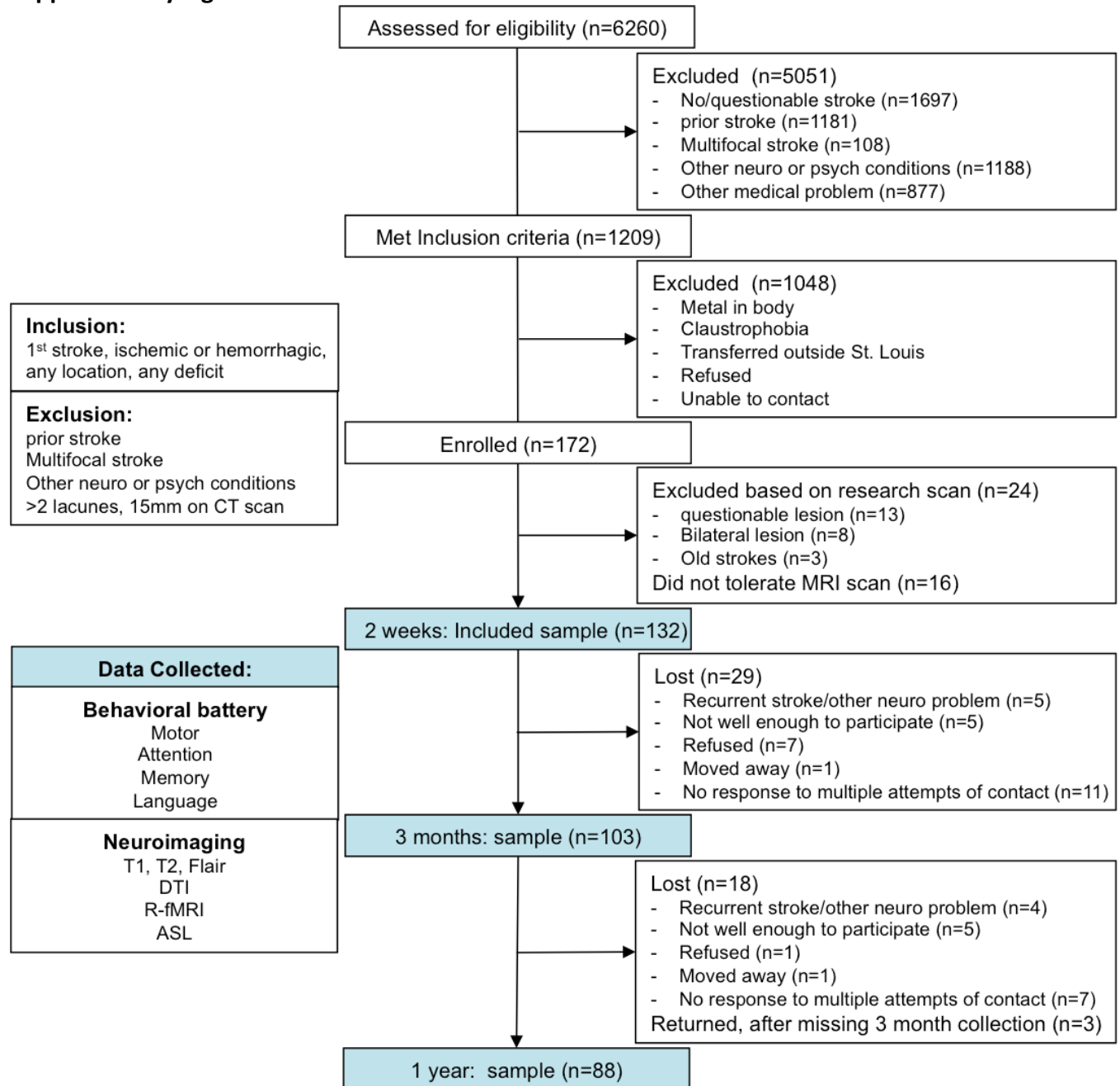


Behavioral clusters and predictors of performance during recovery from stroke

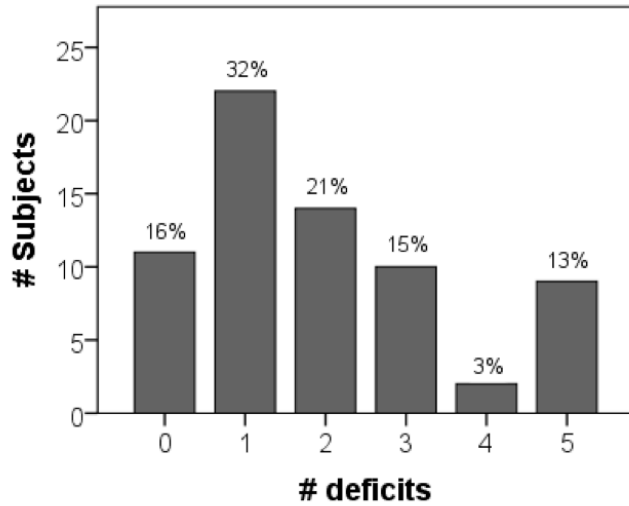
LE Ramsey¹, JS Siegel¹, CE Lang^{1,2,3}, M Strube⁴, GL Shulman¹, M Corbetta^{1,5,6,7,8}

Supplementary Figure 1. Enrollment Flowchart

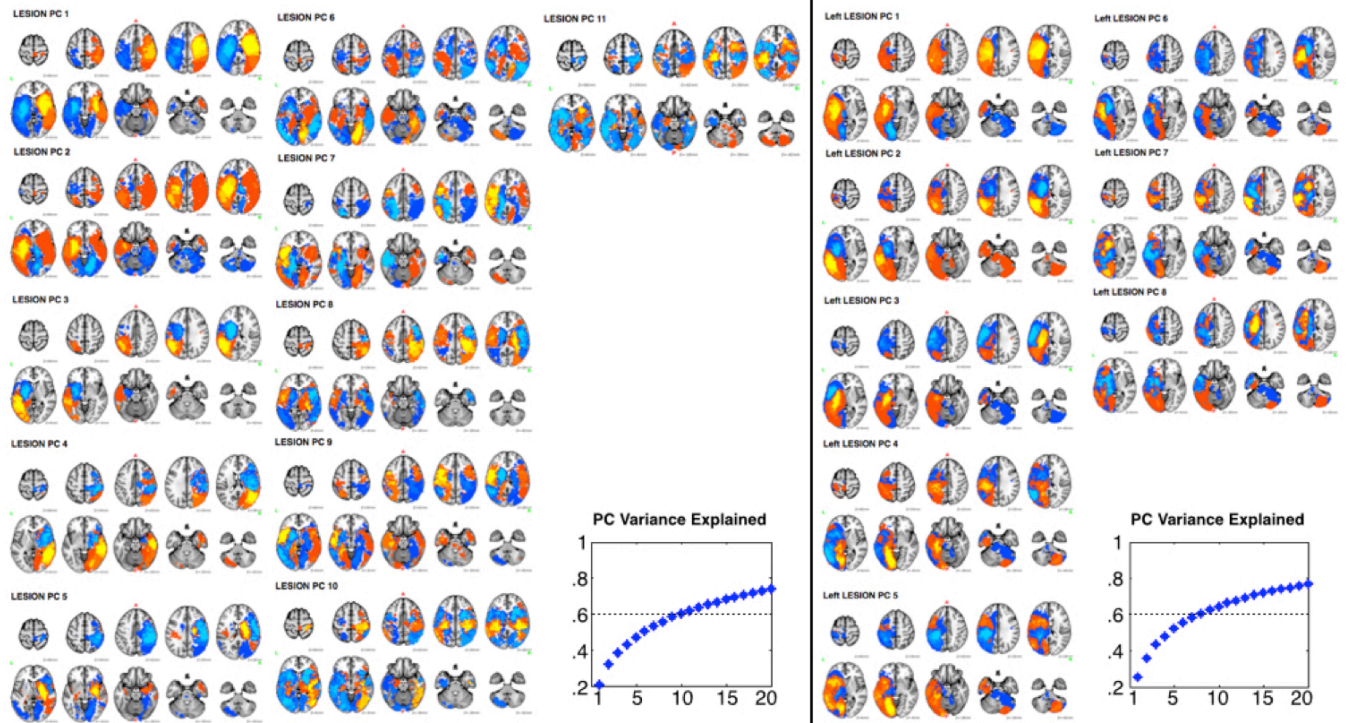


Supplementary Figure 2. Number of deficits. Histogram of the number of patients for each number of deficits (> 2 SD below controls) showing that many patients have more than 1 deficit. Only patients that have scores on all domains (n=67).

Histogram of number of deficits for each patient



Supplementary Figure 3. Principal components of lesions, explaining >60% of variance, for lesions in their original location (a) and all flipped to the left hemisphere (b).



Supplementary Table 1. Demographics of stroke sample, healthy control group and source population (CRRG).

Variables	Stroke (n=132)	Controls (n=31)	CRRG (n=2341)
Age (years)	53 ± 10	55 ± 12	61±15 *
Women	61 (46%)	16 (52%)	1133 (48%)
Right handed	121 (92%)	29 (94%)	?
Left hemisphere lesion	68 (52%)	-	948/1725 (55%)
Lesion type			
Ischemic	102 (82%)	-	1778 (76%)
Hemorrhagic	22 (18%)	-	569 (24%)
TPA	15 (11%)	-	227/2337 (10%)
Race			*
White	45 (34%)	10 (32%)	1419 (61%)
Black or African American	87 (66%)	20 (65%)	866 (37%)
Other	0 (0%)	1 (3%)	56 (2%)
Years of education	13.2 ± 2.6	13.6 ± 2.6	12.6 ± 2.8*
Risk factors			
Hypertension	92 (70%)	8 (26%)*	1709 (73%)
Diabetes Mellitus	41 (31%)	5 (16%)	462 (20%)*
CAD	11 (8%)	2 (6%)	512 (22%)*
Smoking	62 (47%)	13 (42%)	855 (37%)*
Hours of Therapy	94 ± 143	-	
Lesionsize in cm3	34.6 ± 46.9	-	

*significantly different from stroke sample (p<0.05)

Supplementary Table 2. Behavioral measures.⁸

Domain	Test	Score recorded	Function tested
Motor (15 scores)	AROM: Shoulder flexion	L&R Shoulder flexion ¹	Range of motion (ROM)
	AROM: Wrist extension	L&R Wrist extension ¹	
	AROM Lower extremity	L&R Ankle dorsiflection ¹	
	Jaram dynamometer	L&R Grip strength ¹	Strength
	Nine hole peg test	L&R Hand pegs/sec ¹	Dexterity
	ARAT	L&R Total ¹	Dexterity and ROM
	Motricity index	L&R Lower extremity total ¹	Strength
	Timed walk	Index of timed walk + FIM walk item	Walking
	FIM Walk Item		Walking
Language (9 scores)	BDAE: Comprehension	Basic word discrimination	Comprehension
		Commands	
		Complex ideational material	
	BDAE: Expression	Boston naming short form	production, semantic
	BDAE Reading	Oral reading of sentences	comprehension
		Comprehension of oral reading of sentences	
Experimental measures	Nonword reading	production, phonological	
	Stem completion		
Verbal fluency	Animal naming test	production, semantic, executive functioning	
Memory (10 scores)	BVMT	Immediate total recall T-score	Spatial, recall
		Delayed recall T-score	
		Delayed recall percent retained	
		Delayed recognition discrimination index	
	HVLT	Immediate total recall T-score	Verbal, recall
		Delayed recall T-score	
		Delayed recall percent retained	
		Delayed recognition discrimination index	
Spatial span	Span forward	Spatial, recall, executive functioning	
	Span backward		
Attention (10 scores)	Posner orienting task, reaction time	Visual field effect (left-right)	Visuospatial bias
		Overall performance	Sustained attention
		Validity effect (valid-invalid)	Attention shifting
		Disengagement effect [(LI-LV)-RI-RV]	Reorienting attention
	Posner orienting task, accuracy	Visual field effect (left-right)	Visuospatial bias
		Overall performance	Sustained attention
		Validity effect (valid-invalid)	Attention shifting
		Disengagement effect [(LI-LV)-RI-RV]	Reorienting attention
	BIT star cancellation	Center of cancellation	Visuomotor spatial deficits
	Mesulam unstructured symbol cancellation	Center of cancellation	

¹Collected separately for the left and right limb

Supplementary Table 3. Prediction of 1 year scores using demographics and the acute score.

Prediction of 1 year	Standardized β				
	Language	Verbal Mem	Spatial Mem	Motor	Attention
Lesion size	-0.020	-0.018	0.311*	-0.081	0.005
Age	-0.013	-0.270*	-0.204*	-0.048	-0.126
Education (years)	0.288**	-0.002	0.077	-0.014	0.046
Therapy (hours)	-0.056	-0.045	-0.069	-0.103	0.059
Sub-Acute score	0.606**	0.696**	0.628**	0.735**	0.592**
Adjusted R ²	0.543**	0.618**	0.467**	0.661**	0.306**

*P<0.05

**P<0.001

Supplementary Table 4. Correlations between demographics and behavioral measures.

Controls (n=31)	Age	Education (years)	Therapy (hours)	Lesion size	Lacunae (#)	WM Disease
Age		0.305*	-	-		
Education (years)			-	-		
Stroke (n=132)						
Age		-0.103	0.156	0.064	0.069	0.229**
Education (years)			-0.010	-0.152	-0.165	-0.006
Therapy (hours)				0.476**	0.043	-0.054
Lesion size					-0.102	-0.147
Lacunae (#)						0.362**
NIHSS						
Total	0.098	-0.048	0.588**	0.588**	-0.070	-0.040
Acute (2 weeks) post stroke						
Language	-0.167	0.173	-0.523**	-0.447**	-0.183*	-0.047
Verbal Memory	-0.262**	0.305**	-0.277**	-0.125	-0.106	-0.036
Spatial Memory	-0.298**	0.342**	-0.434**	-0.426**	0.008	-0.078
Attention	-0.055	0.161	-0.197*	-0.343**	0.088	0.143
Motor	-0.111	0.030	-0.531**	-0.419**	0.172	0.094
3 Months						
Language	-0.153	0.329**	-0.553**	-0.553**	-0.223*	-0.051
Verbal Memory	-0.316**	0.250*	-0.295**	-0.178	-0.153	-0.011
Spatial Memory	-0.173	0.331**	-0.112	-0.092	-0.168	-0.193
Attention	-0.188	0.104	-0.411**	-0.418**	-0.002	0.133
Motor	-0.175	-0.005	-0.555**	-0.286**	0.087	0.051
Improvement (Acute to 3 months)						
Language	0.133	0.027	0.351**	0.220*	0.116	0.040
Verbal Memory	-0.045	-0.031	0.007	0.059	0.041	0.078
Spatial Memory	0.084	0.036	0.300**	0.455**	-0.149	-0.132
Attention	-0.009	-0.166	0.283*	0.276*	-0.147	-0.129
Motor	0.014	0.084	0.293**	0.181	-0.055	-0.076
Improvement (Acute to 3 months, acute regressed out)						
Language	-0.019	0.283**	-0.158	0.283**	-0.082	-0.007
Verbal Memory	-0.216	0.089	-0.142	-0.027	-0.009	0.072
Spatial Memory	-0.064	0.218	0.154	0.235*	-0.188	-0.211
Attention	-0.208	-0.026	-0.119	-0.087	-0.088	-0.023
Motor	-0.097	0.079	-0.035	-0.031	0.004	-0.030

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)