

Supplementary Material:

The structural connectome and motor recovery after stroke: predicting natural recovery

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ID	Dataset	Age	Sex	Hand dominance	Stroke lesion			Time after stroke (d)	
					Side	Volume (ml) TA	Volume (ml) TC	TA	TC
1	SEOUL	33	m	r	l	2259	1106	9	93
2	SEOUL	54	m	r	r	33934	25145	39	112
3	SEOUL	63	m	r	l	3554	1772	11	88
4	SEOUL	60	m	r	r	157380	138096	24	100
5	SEOUL	60	m	r	r	105020	93552	30	113
6	SEOUL	79	f	r	r	19394	9101	25	103
7	SEOUL	48	f	r	r	8005	5303	16	98
8	SEOUL	71	f	r	r	1529	1127	23	93
9	SEOUL	53	f	r	r	11892	5657	13	87
10	SEOUL	75	m	r	r	15536	12574	15	90
11	SEOUL	66	m	r	r	31427	23259	13	88
12	SEOUL	65	f	r	r	5096	4377	8	80
13	SEOUL	66	m	r	l	47111	41153	24	115
14	SEOUL	55	m	r	l	29341	13641	19	98
15	SEOUL	60	f	r	l	3000	2858	16	93
16	SEOUL	67	f	r	l	1664	1899	19	95
17	SEOUL	70	m	r	l	3810	2468	13	84
18	SEOUL	66	f	r	l	397	254	12	99
19	SEOUL	61	f	r	l	34677	26721	11	93
20	SEOUL	55	f	r	r	4276	3029	11	99
21	SEOUL	54	m	r	r	47517	45104	12	94
22	SEOUL	54	f	r	r	27519	15929	12	124
23	SEOUL	52	m	r	l	2288	1399	7	77
24	SEOUL	28	f	r	r	149857	363801	16	90
25	SEOUL	58	f	r	l	4574	2309	10	94
26	SEOUL	39	m	r	r	3107	2702	11	115
27	SEOUL	53	m	r	l	578	648	9	73
28	SEOUL	47	f	l	l	69412	58479	1	115
29	SEOUL	55	m	r	l	25826	21182	12	105
30	SEOUL	37	f	r	l	1832	6228	10	112
31	SEOUL	62	m	r	l	99071	105991	14	92
32	SEOUL	61	f	r	r	37622	28895	10	92
33	SEOUL	52	m	r	l	34847	21101	14	97
34	SEOUL	60	m	r	r	66362	66563	10	92
35	SEOUL	52	f	r	r	14074	10545	11	96
36	SEOUL	67	m	r	r	4245	1901	9	94
37	SEOUL	35	f	l	r	51520	53719	11	101
38	SEOUL	68	m	r	r	51366	25735	15	94

39	SEOUL	42	f	r	l	93720	107332	9	110
40	SEOUL	32	m	r	l	90841	73328	10	99
41	SEOUL	45	f	r	r	7790	6298	9	104
42	SEOUL	33	m	l	l	6063	5831	12	90
43	SEOUL	35	m	r	l	195308	163595	20	90
44	SEOUL	69	f	r	r	4398	4115	13	92
45	SEOUL	69	f	r	l	37893	46889	21	109
46	SEOUL	49	m	r	r	1910	2025	15	88
47	SEOUL	67	f	r	r	9124	5099	16	98
48	SEOUL	52	f	r	r	8077	9084	9	85
49	SEOUL	55	f	r	b	9768	13514	10	94
50	SEOUL	58	f	r	l	82982	52753	14	104
51	SEOUL	64	m	r	l	18894	18361	12	92
52	SEOUL	68	m	r	r	1873	1430	13	93
53	SEOUL	69	m	r	l	1401	1429	12	93
54	SEOUL	69	m	r	r	1163	1347	21	106
55	SEOUL	79	f	r	r	2274	2251	24	124
56	SEOUL	62	m	r	r	2114	2337	36	137
57	SEOUL	77	m	r	r	3789	2871	19	117
58	SEOUL	70	f	r	r	51628	55355	7	129
59	SEOUL	80	f	r	l	4635	5878	12	99
60	SEOUL	67	m	r	l	29187	19738	14	112
61	SEOUL	56	m	r	r	272515	277206	14	85
62	SEOUL	73	f	r	l	11415	5927	16	81
63	SEOUL	54	m	r	l	2030	1009	15	85
1	GENEVA	67	m	r	r	88700	91009	6	172
2	GENEVA	48	f	r	l	39513	23979	9	86
3	GENEVA	54	f	r	l	13688	10136	21	152
4	GENEVA	68	m	l	r	64250	86195	12	97
5	GENEVA	37	m	r	l	114095	125225	33	161
6	GENEVA	70	f	r	l	111525	85879	13	111
7	GENEVA	78	f	r	r	6569	6591	24	82
8	GENEVA	53	m	r	r	7489	3158	26	89
9	GENEVA	47	m	r	r	45369	38594	26	96
10	GENEVA	43	m	l	l	144871	88602	7	90
11	GENEVA	80	f	r	r	4909		13	
12	GENEVA	62	m	r	r	57902		20	
13	GENEVA	63	m	r	l	38380		11	
14	GENEVA	46	f	r	r	3573		19	
15	GENEVA	52	m	r	r	6818		35	
1	PARIS	63	f	r	r	36403	40295	33	85
2	PARIS	42	f	a	l	48986	50555	24	84
3	PARIS	46	m	r	r	14561	14867	27	87
4	PARIS	80	m	r	l	2732	1472	20	88
5	PARIS	60	m	r	r	77417	75682	41	83
6	PARIS	85	m	r	r	19347	15141	37	109
7	PARIS	62	f	r	l	90061	101805	12	76
8	PARIS	61	f	r	r	84403	62120	32	104
9	PARIS	25	m	r	l	26751	30651	31	74
10	PARIS	34	m	r	r	61936	73353	29	92
11	PARIS	40	m	r	r	58111	47577	32	92
12	PARIS	63	f	r	r	20963	16316	25	78
13	PARIS	61	m	l	l	12925	7080	26	118
14	PARIS	52	m	l	l	6035	3489	32	95

SOM Table 1.1 | Clinical description of recruited patients

Please see below.

ID	Dataset	NIHSS at TA	FMUE		Pinch strength affected (kg)		Grip strength affected (kg)		Box & Block affected	
			TA	TC	TA	TC	TA	TC	TA	TC
1	SEOUL	0	41	62	0.5	3.7	0.5	3.7	32	
2	SEOUL	6	16	30	0.0	0.0	0.0	0.0	0	0
3	SEOUL	6	24	21	0.8	1.1	0.8	1.1	0	0
4	SEOUL	6	29	46	0.0	0.0	0.0	0.0	0	3
5	SEOUL	10	10	14	0.0	0.0	0.0	0.0	0	0
6	SEOUL	8	20	47	0.0	0.7	0.0	0.7	0	15
7	SEOUL	6	18	41	0.0	0.1	0.0	0.1	0	26
8	SEOUL	5	34	58	0.7	2.5	5.9	1.3	23	
9	SEOUL	2	58	60	0.7	2.6	6.0	21.7	15	8
10	SEOUL	2	60	58	1.4	2.2	3.3	2.0	41	45
11	SEOUL	6	44	55	0.0	3.8	0.0	2.7	1	30
12	SEOUL	4	55	66	3.1	4.2	10.8	14.0	35	
13	SEOUL	8	62	66	3.2	4.6	14.0	10.0	24	53
14	SEOUL	4	56	62	0.9	3.1	2.0	9.7	24	52
15	SEOUL	3	45	59	0.8	4.0	0.0	3.3	35	57
16	SEOUL	5	28	57	0.0	0.0	2.7	0.1	21	50
17	SEOUL	4	50	66	0.0	3.5	1.0	20.0	12	51
18	SEOUL	7	12	20	0.0	0.0	0.0	0.0	0	3
19	SEOUL	11	5	7	0.0	0.0	0.0	0.0	0	0
20	SEOUL	6	20	45	0.0	1.0	0.0	2.0	0	30
21	SEOUL	4	49	57	1.0	2.0	12.0	19.0	28	40
22	SEOUL	8	63	65	1.0	1.5	6.0	14.0	46	47
23	SEOUL	4	27	50	0.0	0.5	0.0	8.0	0	20
24	SEOUL	11	5	12	0.0	0.0	0.0	0.0	0	0
25	SEOUL	6	10	27	0.0	0.0	0.0	0.0	0	17
26	SEOUL	2	48	66	1.0	3.0	10.0	34.0	22	58
27	SEOUL	9	5	44	0.0	1.5	0.0	10.0	0	24
28	SEOUL	6	17	59	0.0	0.0	0.0	2.0	0	28
29	SEOUL	10	10	43	1.5	4.0	12.0	25.0	0	33
30	SEOUL	8	11	60	0.0	0.5	0.0	12.0	0	24
31	SEOUL	5	4	20	0.0	0.0	0.0	0.0	0	0
32	SEOUL	13	15	18	0.0	0.0	0.0	0.0	0	0
33	SEOUL	14	30	55	0.0	0.0	0.0	7.0	0	35
34	SEOUL	13	9	9	0.0	0.0	0.0	0.0	0	0
35	SEOUL	3	18	34	0.0	0.0	0.0	1.0	0	18
36	SEOUL	8	6	20	0.0	0.0	0.0	0.0	0	0
37	SEOUL	11	6	14	0.0	0.0	0.0	0.0	0	0
38	SEOUL	2	22	58	0.0	0.2	0.0	8.0	0	20
39	SEOUL	7	4	20	0.0	0.0	0.0	0.0	0	0
40	SEOUL	16	6	37	0.0	0.0	0.0	22.0	0	1
41	SEOUL	7	15	47	0.0	0.0	0.0	0.5	0	13
42	SEOUL	4	16	37	0.0	0.0	0.0	15.0	0	4
43	SEOUL	19	6	6	0.0	0.0	0.0	0.0	0	0
44	SEOUL	8	11	11	0.0	0.0	0.0	0.0	8	0
45	SEOUL	8	17	40	0.0	0.0	0.0	0.0	0	21
46	SEOUL	6	17	36	0.0	0.0	0.0	15.0	0	24
47	SEOUL	8	18	18	0.0	0.0	0.0	0.0	0	0
48	SEOUL	6	16	16	0.0	0.0	0.0	0.0	0	0
49	SEOUL	8	36	36	0.0	0.0	0.0	0.0	0	0
50	SEOUL	11	4	4	0.0	0.0	0.0	0.0	0	0
51	SEOUL	14	10	24	0.0	1.1	0.0	5.0	0	20
52	SEOUL	8	15	20	0.0	0.0	0.0	0.0	0	0
53	SEOUL	6	28	30	0.0	0.0	0.0	0.0	0	0
54	SEOUL	4	49	66	0.5	1.4	4.0	8.5	27	38
55	SEOUL	10	8	24	0.0	0.0	0.0	0.0	0	0
56	SEOUL	4	32	44	0	3.2	2.2	1.4	13	33

57	SEOUL	7	56	55	1.9	4.8	12.7	12.0	37	27
58	SEOUL	5	49	55	0	2.7	9	0.3	23	29
59	SEOUL	5	41	54	0	2.5	4.9	0.5	0	41
60	SEOUL	16	4	4	0	0	0	0.0	0	0
61	SEOUL	10	4	4	0	0	0	0.0	0	0
62	SEOUL	2	21	55	0	3.4	0	0.1	2	51
63	SEOUL	5	14	53	0	2.1	0	0.3	0	47
1	GENEVA	13	4	4			0	0		
2	GENEVA	27	4	8			0	0		
3	GENEVA	6	51	64			8	8		
4	GENEVA	16	4	20			0	1		
5	GENEVA	8	64	64			30	36		
6	GENEVA	14	4	4			0	0		
7	GENEVA	9	34	44			0	6		
8	GENEVA	5	66	66			41	43		
9	GENEVA	3	66	66			33.5	41		
10	GENEVA	18	21	54			11	26.6		
11	GENEVA	5	34				3.6			
12	GENEVA	9	4				0			
13	GENEVA	12	4				0			
14	GENEVA	4	66				31.7			
15	GENEVA	14	7				0			
1	PARIS	17					0	0		
2	PARIS	25					0	0		
3	PARIS	8					0	0		
4	PARIS	5					36.5	33.8		
5	PARIS	7					13.3	16.3		
6	PARIS	16					16.2	14.9		
7	PARIS	19					0	0		
8	PARIS	15					0.9	5.2		
9	PARIS	17					0	0		
10	PARIS	17					0	0		
11	PARIS	6					0	5.6		
12	PARIS	16					0	0		
13	PARIS	2					0	0		
14	PARIS	12					29.7	34.3		

SOM Table 1.2 | Clinical description of recruited patients

Please see below.

ID	Dataset	Pinch strength unaffected (kg)		Grip strength unaffected (kg)		Box & Block unaffected		Fitter/ Nonfitter	Severe	MEP (+/-) ~ 2 weeks after onset	i.v. tPA (1) or i.a. tPA (2)
		TA	TC	TA	TC	TA	TC				
		1	SEOUL	4.2	4.2	27.0	27.0				
2	SEOUL	4.0	4.0	34.0	32.0	60	71	Nonfitter	Yes	-	
3	SEOUL	4.9	4.9	25.0	25.0	57	57	Nonfitter		-	
4	SEOUL	4.6	5.4	45.0	39.0	61	61	Fitter		-	2
5	SEOUL	4.8	5.5	27.0	27.0	58	58	Nonfitter	Yes	-	
6	SEOUL	2.1	2.8	13.0	13.0	46	33	Fitter	Yes	-	
7	SEOUL	6.4	6.4	22.0	21.0	62	49	Fitter	Yes	-	
8	SEOUL	4.1	5.6	36.9	18.7	30	30	Fitter		+	
9	SEOUL	3.1	2.9	17.3	18.7	68	54	Fitter		+	
10	SEOUL	3.5	3.7	18.7	18.0	53	58	Fitter		+	1
11	SEOUL	3.9	5.5	8.0	27.3	42	72	Fitter		+	
12	SEOUL	3.5	4.0	18.6	15.7	55	55	Fitter		+	
13	SEOUL	3.7	6.3	25.0	29.0	24	53	Fitter		+	1,2
14	SEOUL	3.9	3.9	13.7	14.0	55	55	Fitter		+	
15	SEOUL	3.6	3.8	10.0	10.7	59	65	Fitter		-	
16	SEOUL	5.0	3.9	23.6	2.0	50	55	Fitter		+	
17	SEOUL	3.5	4.0	18.0	30.0	53	60	Fitter		-	
18	SEOUL	4.0	4.0	10.0	10.0	45	40	Nonfitter	Yes	-	
19	SEOUL	4.0	4.0	18.0	18.0	42	42	Nonfitter	Yes	-	
20	SEOUL	4.0	3.0	24.0	22.0	51	60	Fitter	Yes	+	
21	SEOUL	3.0	3.0	28.0	28.0	45	45	Fitter		+	1
22	SEOUL	4.0	4.0	16.0	22.0	32	47	Fitter		+	
23	SEOUL	4.0	4.0	38.0	38.0	53	53	Fitter		-	
24	SEOUL	3.0	3.0	24.0	24.0	53	50	Nonfitter	Yes	-	
25	SEOUL	1.5	1.5	10.0	14.0	55	52	Nonfitter	Yes	-	
26	SEOUL	2.5	3.0	36.0	38.0	40	60	Fitter		-	
27	SEOUL	4.5	4.5	34.0	38.0	60	70	Fitter	Yes	-	
28	SEOUL	2.5	2.0	18.0	18.0	42	62	Fitter	Yes	-	
29	SEOUL	4.0	6.0	30.0	35.0	50	53	Fitter	Yes	+	
30	SEOUL	3.0	2.5	18.0	20.0	42	64	Fitter	Yes	-	
31	SEOUL	3.5	3.5	28.0	28.0	43	43	Nonfitter	Yes	-	
32	SEOUL	3.0	3.0	19.0	19.0	52	52	Nonfitter	Yes	-	1,2
33	SEOUL	3.0	5.0	14.0	35.0	59	58	Fitter		-	
34	SEOUL	4.8	4.8	45.0	45.0	35	35	Nonfitter	Yes	-	
35	SEOUL	1.5	1.5	10.0	10.0	40	40	Nonfitter	Yes	-	
36	SEOUL	3.4	3.4	30.0	30.0	44	44	Nonfitter	Yes	-	
37	SEOUL	3.6	3.8	32.0	32.0	55	60	Nonfitter	Yes	-	2
38	SEOUL	4.3	4.3	46.0	46.0	45	50	Fitter		-	2
39	SEOUL	1.5	1.6	9.5	9.5	53	50	Nonfitter	Yes	-	2
40	SEOUL	5.1	5.0	44.0	44.0	55	52	Fitter	Yes	+	1
41	SEOUL	1.2	1.3	6.6	6.6	40	40	Fitter	Yes	-	
42	SEOUL	0.0	8.0	48.0	110.0	74	73	Fitter	Yes	-	1
43	SEOUL	4.0	5.0	22.0	65.0	22	28	Nonfitter	Yes	-	
44	SEOUL	4.0	4.0	14.0	16.0	33	36	Nonfitter	Yes	-	1
45	SEOUL	1.3	2.0	3.1	25.0	17	35	Fitter	Yes	-	1
46	SEOUL	6.4	9.8	33.6	55.6	73	89	Fitter	Yes	-	
47	SEOUL	5.0	6.0	20.0	32.0	48	63	Nonfitter	Yes	-	
48	SEOUL	4.0	4.0	19.4	62.0	71	75	Nonfitter	Yes	-	
49	SEOUL	3.8	3.8	27.9	27.9	70	78	Fitter		-	
50	SEOUL	1.9	1.9	10.4	10.4	41	42	Nonfitter	Yes	-	
51	SEOUL	6.1	6.3	36.7	36.7	48	49	Nonfitter	Yes	-	
52	SEOUL	5.5	6.2	32.6	42.2	47	51	Nonfitter	Yes	-	
53	SEOUL	5.2	8.0	24.7	25.0	37	32	Nonfitter		-	
54	SEOUL	1.5	3.9	18.0	33.3	65	39	Fitter		-	
55	SEOUL	1.9	2.5	18.0	20.3	46	47	Nonfitter	Yes	-	

56	SEOUL	5.1	6.6	35.8	28.3	63	56	Fitter		
57	SEOUL	3.0	4.6	17.2	16.0	50	28	Fitter		+
58	SEOUL	2.6	3.2	9.5	1.3	43	39	Fitter		
59	SEOUL	2.6	3.0	18.1	8.7	46	54	Fitter		-
60	SEOUL	3.2	3.8	18.1	20.3	35	49	Nonfitter	Yes	-
61	SEOUL	3.3	6.1	28.4	28.0	31	46	Nonfitter	Yes	-
62	SEOUL	3.4	2.5	1.0	0.6	57	59	Fitter		-
63	SEOUL	5.3	6.5	21.7	24.0	38	57	Fitter	Yes	-
1	GENEVA				24			Nonfitter	Yes	1
2	GENEVA			22	22			Nonfitter	Yes	1
3	GENEVA			18	18			Fitter		
4	GENEVA			27	27			Nonfitter	Yes	1
5	GENEVA			41.5	40			Fitter		
6	GENEVA			17	17			Nonfitter	Yes	1
7	GENEVA			28	26			Fitter		
8	GENEVA			50	47.3			Fitter		
9	GENEVA			30	40			Fitter		
10	GENEVA			37	49			Fitter		1
11	GENEVA			20				Fitter		1
12	GENEVA			24				Nonfitter	Yes	
13	GENEVA			32				Nonfitter	Yes	
14	GENEVA			30.7				Fitter		
15	GENEVA			30				Nonfitter	Yes	1
1	PARIS			27	36					
2	PARIS			16.8	31.7					1
3	PARIS			16.2	24.1					
4	PARIS			30.7	9.2					1
5	PARIS			31	38.1					1
6	PARIS			30.7	24.6					1
7	PARIS			4.7	8					1
8	PARIS			20.3	13.6					
9	PARIS			27.6	20.9					1
10	PARIS			29.6	28					
11	PARIS			22.3	25.1					1
12	PARIS			18.3	27.5					
13	PARIS			35.6	44.8					
14	PARIS			34.2	26.6					1

SOM Table 1.3 | Clinical description of recruited patients

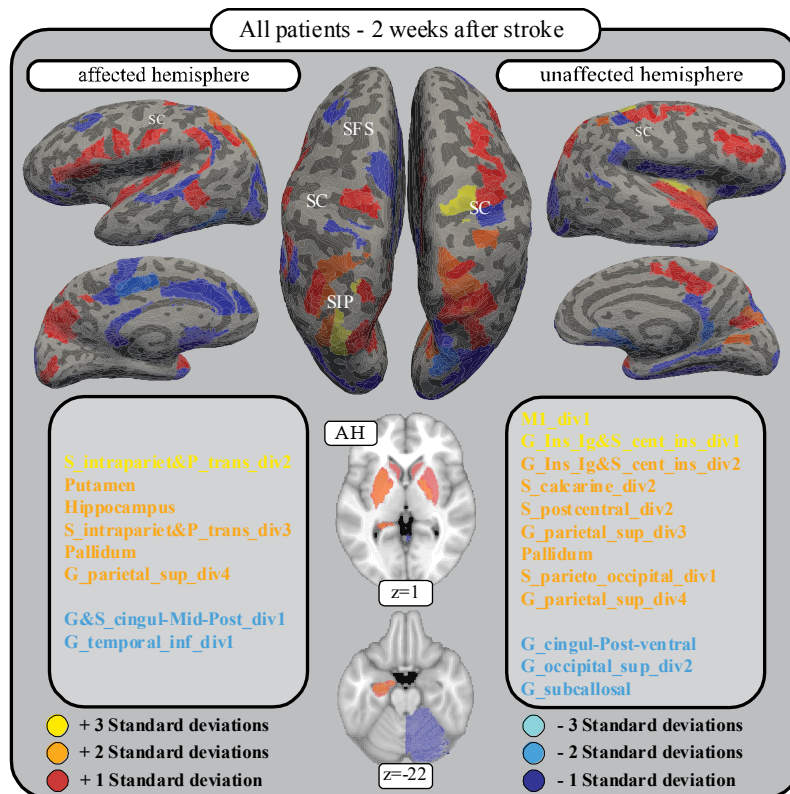
Patients and their clinical characteristics recruited in the three datasets, SEOUL, GENEVA and PARIS. m: male; f: female; r: right, l: left, TA: two weeks after stroke; TC three months after stroke; FMUE: Fugl-Meyer of the upper extremity; MEP: Motor evoked potential, i.v.: Intravenous, i.a.: Intra-arterial, tPA: Tissue plasminogen activator.

Motornetwork	Sensorynetwork	Attentional network
BrainStem	BrainStem	Thalamus
Thalamus	Thalamus	G front inf-Orbital
Caudate	G front inf-Opercular div1	G front inf-Triangul
Putamen	G front inf-Opercular div2	G front inf-Opercular div1
Pallidum	G&S subcentral div1	G front inf-Opercular div2
Cerebellum	G&S subcentral div2	G front middle div1
M1_div1	S1_div1	G front middle div2
M1_div2	S1_div2	G front middle div3
M1_div3	S1_div3	G front middle div4
M1_div4	S1_div4	S front sup div1
PM_div1	G&S paracentral div1	S front sup div2
PM_div2	G&S paracentral div2	G temp sup-G T transv
PM_div3	G parietal_sup_div1	G temp_sup-Plan_polar
PM_div4	G parietal_sup_div2	G temp_sup-Plan_tempo
G_front_middle_div1	G parietal_sup_div3	G temp_sup-Lateral_div1
G_front_middle_div2	G parietal_sup_div4	G temp_sup-Lateral_div2
G_front_middle_div3	G precuneus_div1	G parietal_sup_div1
G_front_middle_div4	G precuneus_div2	G parietal_sup_div2
G_front_sup_div1	G precuneus_div3	G parietal_sup_div3
G_front_sup_div2	G postcentralPost_div1	G parietal_sup_div4
G_front_sup_div3	G postcentralPost_div2	G pariet_inf-Angular_div1
G_front_sup_div4	G postcentralPost_div3	G pariet_inf-Angular_div2
G_front_sup_div5	S intrapariet&P_trans_div1	G pariet_inf-Angular_div3
G_front_sup_div6	S intrapariet&P_trans_div2	G pariet_inf-Supramar_div1
S1_div1	S intrapariet&P_trans_div3	G pariet_inf-Supramar_div2
S1_div2	S intrapariet&P_trans_div4	G pariet_inf-Supramar_div3
S1_div3	S intrapariet&P_trans_div5	G pariet_inf-Supramar_div4
S1_div4	S postcentral_div1	G precuneus_div1
G_pariet_inf-Angular_div1	S postcentral_div2	G precuneus_div2
G_pariet_inf-Angular_div2	S postcentral_div3	G precuneus_div3
G_pariet_inf-Angular_div3	S postcentral_div4	S intrapariet&P_trans_div1
G_pariet_inf-Supramar_div1	Lat Fis-post_div1	S intrapariet&P_trans_div2
G_pariet_inf-Supramar_div2	Lat Fis-post_div2	S intrapariet&P_trans_div3
G_pariet_inf-Supramar_div3	G insular_short	S intrapariet&P_trans_div4
G_pariet_inf-Supramar_div4	S circular_insula_ant	S intrapariet&P_trans_div5
S_intrapariet&P_trans_div1	S circular_insula_inf_div1	G&S_cingul-Ant_div1
S_intrapariet&P_trans_div2	S circular_insula_inf_div2	G&S_cingul-Ant_div2
S_intrapariet&P_trans_div3	S circular_insula_sup_div1	G&S_cingul-Ant_div3
S_intrapariet&P_trans_div4	S circular_insula_sup_div2	G insular_short
S_intrapariet&P_trans_div5	G_Ins_lg&S_cent_ins_div1	S_circular_insula_ant
	G_Ins_lg&S_cent_ins_div2	S_circular_insula_inf_div1
		S_circular_insula_inf_div2
		S_circular_insula_sup_div1
		S_circular_insula_sup_div2
		G_Ins_lg&S_cent_ins_div1
		G_Ins_lg&S_cent_ins_div2

SOM Table 2 | Brain areas labelled according to the Destrieux Atlas and their contribution to functional networks

For details on the labels please see (Destrieux *et al.*, 2010); Div*: The number refers to the parcellation along the longest axis of the respective label

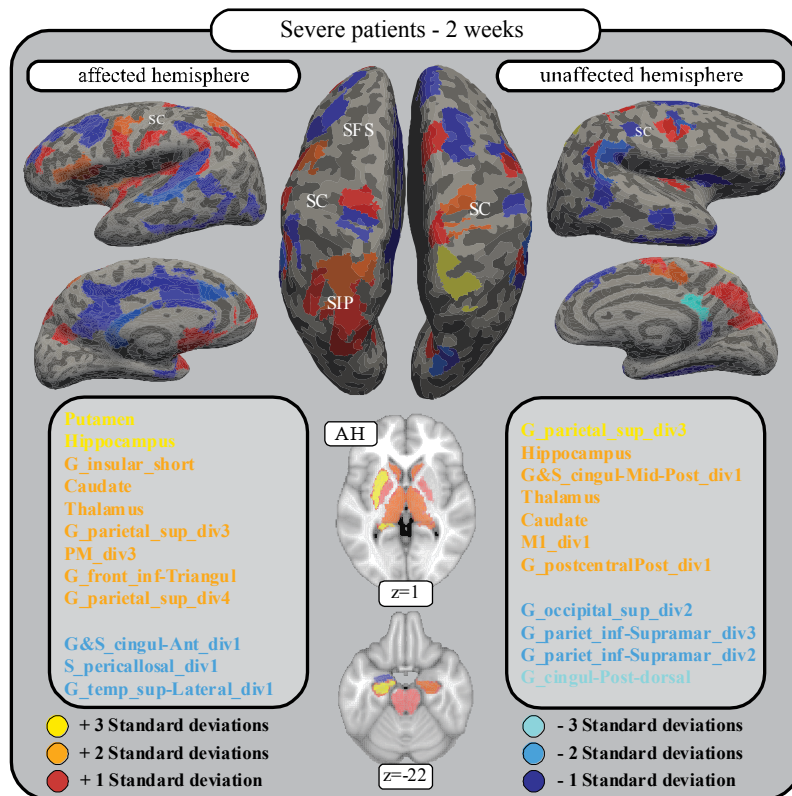
Results:



SOM Figure 1 | Features for all patients - subacute (two weeks): Brain areas of the connectome in which connectivity positively (red) or negatively (blue) correlates with the likelihood of the patient being a fitter. The feature weights of all connections were summed for each area of the parcellation, and a z-transform was applied. Here, only those areas exceeding one standard deviation are shown, and areas exceeding two standard deviations are listed as well. For all the results, please see table 4 in the SOM.

This figure illustrates the results for the SVM including all subjects in the SEOUL dataset with the connectomes at two weeks after stroke (TA). The results are presented on the inflated FreeSurfer brain as well as the Montreal Neurological Institute standard brain, with z-coordinates given. Darker gray areas on the inflated FreeSurfer brain represent sulci, whereas lighter gray areas represent gyri.

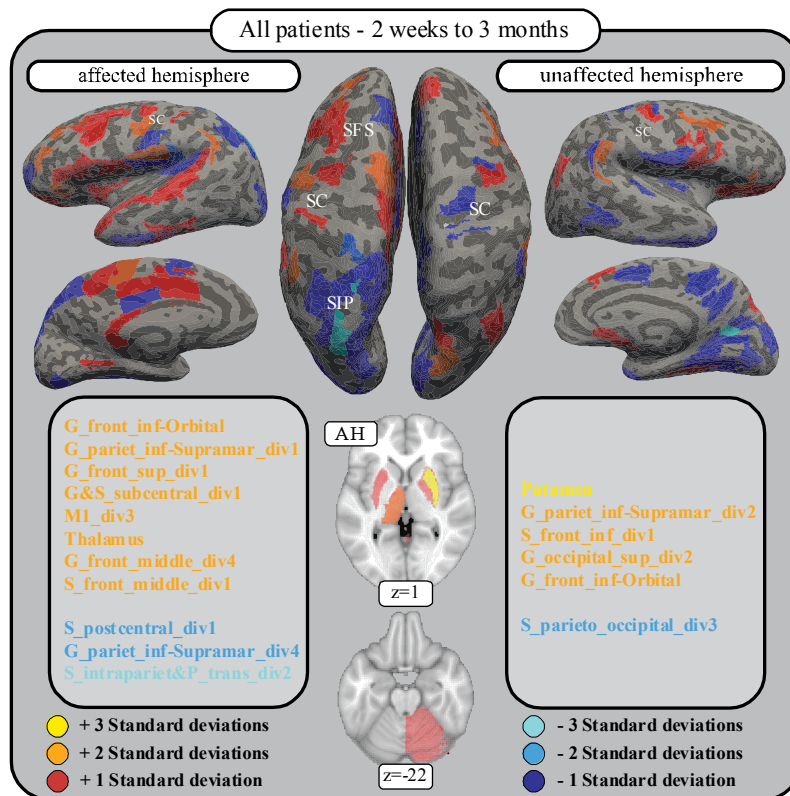
AH: Affected hemisphere; G&S_cingul-Mid-Post*: Middle-posterior part of the cingulate gyrus and sulcus (pMCC); G_cingul-Post-ventral: Posterior-ventral part of the cingulate gyrus (vPCC, isthmus of the cingulate gyrus); G_Ins_Ig&S_cent_ins*: Long insular gyrus and central sulcus of the insula; G_occipital_sup*: Superior occipital gyrus (O1); G_parietal_sup*: Superior parietal lobule (lateral part of P1); G_subcallosal: Subcallosal area, subcallosal gyrus; G_temporal_inf*: Inferior temporal gyrus; M1*: Primary motor cortex; S_calcarine*: Calcarine sulcus; SFS: Superior frontal sulcus; SC: Central sulcus, SIP: Intraparietal sulcus; S_intrapariet&P_trans*: Intraparietal sulcus (interparietal sulcus) and transverse parietal sulci; S_parieto_occipital*: Parieto-occipital sulcus (or fissure); S_postcentral*: Postcentral sulcus.



SOM Figure 2 | Features for severe patients – subacute (two weeks): Brain areas of the connectome in which connectivity positively (red) or negatively (blue) correlates with the likelihood of the patient being a fitter. The feature weights of all connections were summed for each area of the parcellation, and a z-transform was applied. Here, only those areas exceeding one standard deviation are shown, and areas exceeding two standard deviations are listed as well. For all the results, please see table 4 in the SOM.

This figure illustrates the results for the SVM including only the severely impaired patients in the SEOUL dataset with the connectomes at two weeks after stroke (TA). The results are presented on the inflated FreeSurfer brain as well as the Montreal Neurological Institute standard brain, with z-coordinates given. Darker gray areas on the inflated FreeSurfer brain represent sulci, whereas lighter gray areas represent gyri.

AH: Affected hemisphere; G&S_cingul-Ant*: Anterior part of the cingulate gyrus and sulcus (ACC); G&S_cingul-Mid-Post*: Middle-posterior part of the cingulate gyrus and sulcus (pMCC); G_cingul-Post-dorsal: Posterior-dorsal part of the cingulate gyrus (dPCC); G_front_inf-Triangul: Triangular part of the inferior frontal gyrus; G_insular_short: Short insular gyri; G_occipital_sup*: Superior occipital gyrus (O1); G_pariet_inf-Supramar*: Supramarginal gyrus; G_parietal_sup*: Superior parietal lobule (lateral part of P1); G_postcentralPost*: Posterior bank of the postcentral gyrus; G_temp_sup-Lateral*: Lateral aspect of the superior temporal gyrus; M1*: Primary motor cortex; PM*: Premotor cortex; SC: Central sulcus, SFS: Superior frontal sulcus; SIP: Intraparietal sulcus; S_pericallosal*: Pericallosal sulcus (S of corpus callosum).

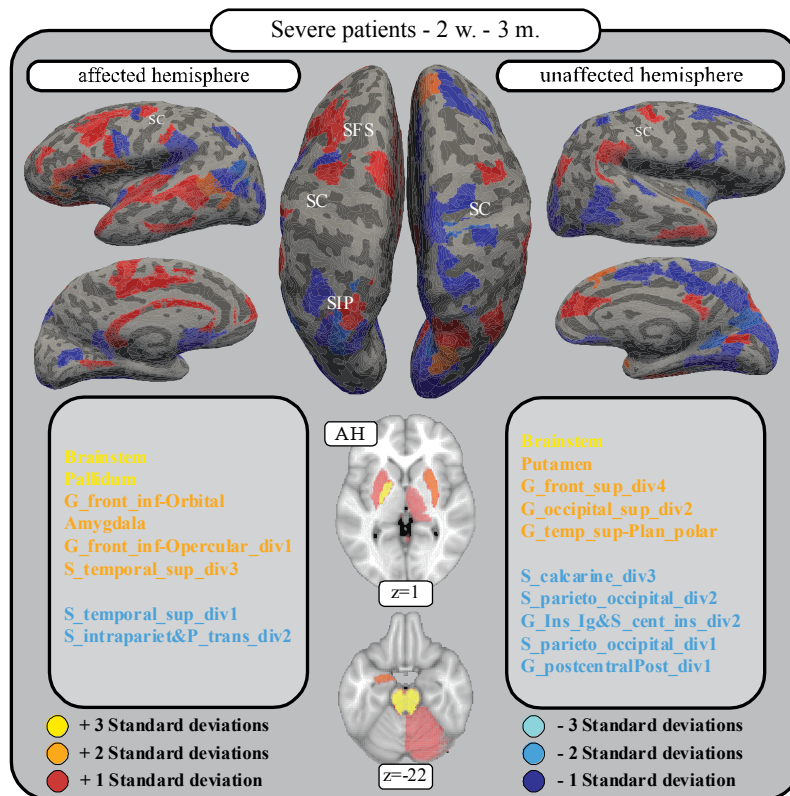


SOM Figure 3 | Features for all patients - Subacute to chronic (two weeks to three months):

Brain areas of the connectome in which connectivity positively (red) or negatively (blue) correlates with the likelihood of the patient being a fitter. The feature weights of all connections were summed for each area of the parcellation, and a z-transform was applied. Here, only those areas exceeding one standard deviation are shown, and areas exceeding two standard deviations are listed as well. For all the results, please see table 4 in the SOM.

This figure illustrates the results for the SVM including all subjects in the SEOUL dataset with connectome changes between two weeks and three months after stroke (TC-TA). The results are presented on the inflated FreeSurfer brain as well as the Montreal Neurological Institute standard brain, with z-coordinates given. Darker gray areas on the inflated FreeSurfer brain represent sulci, whereas lighter gray areas represent gyri.

AH: Affected hemisphere; G&S_subcentral*: Subcentral gyrus (central operculum) and sulci; G_front_middle*: Middle frontal gyrus (F2); G_front_inf-Orbital: Orbital part of the inferior frontal gyrus; G_front_sup*: Superior frontal gyrus (F1); G_occipital_sup*: Superior occipital gyrus (O1); G_pariet_inf-Supramar*: Supramarginal gyrus; M1*: Primary motor cortex; S_front_inf*: Inferior frontal sulcus, S_front_middle*: Middle frontal sulcus; SFS: Superior frontal sulcus; SC: Central sulcus, SIP: Intraparietal sulcus; S_intrapariet&P_trans*: Intraparietal sulcus (interparietal sulcus) and transverse parietal sulci; S_parieto_occipital*: Parieto-occipital sulcus (or fissure); S_postcentral*: Postcentral sulcus



SOM Figure 4 | Features for severe patients – subacute to chronic (two weeks to three months): Brain areas of the connectome in which connectivity positively (red) or negatively (blue) correlates with the likelihood of the patient being a fitter. The feature weights of all connections were summed for each area of the parcellation, and a z-transform was applied. Here, only those areas exceeding one standard deviation are shown, and areas exceeding two standard deviations are listed as well. For all the results, please see table 4 in the SOM.

This figure illustrates the results for the SVM including only the severely impaired patients in the SEOUL dataset with the connectome changes between two weeks and three months after stroke (TC-TA). The results are presented on the inflated FreeSurfer brain as well as the Montreal Neurological Institute standard brain, with z-coordinates given. Darker gray areas on the inflated FreeSurfer brain represent sulci, whereas lighter gray areas represent gyri.

AH: Affected hemisphere; G_front_inf-Orbital: Orbital part of the inferior frontal gyrus; G_front_inf-Opercular*: Opercular part of the inferior frontal gyrus; G_front_sup*: Superior frontal gyrus (F1); G_Ins_Ig&S_cent_ins*: Long insular gyrus and central sulcus of the insula; G_occipital_sup*: Superior occipital gyrus (O1); G_postcentralPost*: Posterior bank of the postcentral gyri; G_temp_sup-Plan_polar: Planum polare of the superior temporal gyrus; SC: Central sulcus, S_calcarine*: Calcarine sulcus; SFS: Superior frontal sulcus; SIP: Intraparietal sulcus; S_intrapariet&P_trans*: Intraparietal sulcus (interparietal sulcus) and transverse parietal sulci; S_parieto_occipital*: Parieto-occipital sulcus (or fissure); S_temporal_sup*: Superior temporal sulcus (parallel sulcus).

Comparison predictive power

In order to validate if a preselection of patient population based on the connectome classifiers has an effect on regression models of functional recovery

Regression analyses were performed correlating the initial FMUE score to the percentage of change in FM considering all subjects, only fitters and only nonfitters, as defined by the connectome classifier.

Model	Slope	p-value	Std-error	95-CI value	Lower	95-CI value	Higher
All subjects	-0.14	0.12	0.088	0.197		0.470	
Fitters	-0.35	0.0009	0.097	0.166		0.496	
Nonfitters	-0.38	0.092	0.216	0.068		0.671	

SOM Table 3 | Correlation of functional scores for subgroup of patients

All patients - TA connectome		All patients - TC-TA connectome		Severe patients - TA connectome		Severe patients - TC-TA connectome	
Area name	Z-scores	Area name	Z-scores	Area name	Z-scores	Area name	Z-scores
ah_S_intrapariet &P_trans_div2	3.37499	uh_G_front_middle_div3	3.13496	uh_Pallidum	3.69598	ah_S_temporal_sup_div7	3.65119
uh_M1_div1	3.17318	ah_G&S_cingul-Ant_div1	2.83526	uh_Medial_wall	3.03756	uh_PM_div1	3.52476
uh_G_Ins_lg&S_cent_ins_div1	3.10926	ah_Lat_Fis-ant-Vertical	2.79338	uh_M1_div1	3.00469	ah_G&S_cingul-Ant_div1	2.65947
uh_G_Ins_lg&S_cent_ins_div2	2.95494	ah_S_postcentral_div2	2.67456	uh_Lat_Fis-ant-Vertical	2.78690	uh_G_front_middle_div3	2.41139
ah_Putamen	2.83085	ah_G_occipital_sup_div1	2.67445	uh_G&S_subcentral_div2	2.70128	uh_G&S_cingul-Ant_div1	2.37665
uh_S_calcarine_div2	2.78645	uh_Pole_occipital_div1	2.55368	uh_G&S_transv_frontopol	2.63873	uh_S_collat_transv_ant	2.37180
uh_S_postcentral_div2	2.71276	uh_G_postcentralPost_div1	2.49383	uh_G_front_inf-Opercular_div2	2.49131	ah_G_pariet_inf-Angular_div3	2.27574
ah_Hippocampus	2.64092	ah_G_oc-temp_med-Parahip_div2	2.39534	uh_G_oc-temp_med-Lingual_div3	2.42973	ah_G_front_inf-Opercular_div2	2.17077
uh_G_parietal_sup_div3	2.58618	ah_S_subparietal_div1	2.35827	uh_G_pariet_inf-Angular_div2	2.35257	ah_G_oc-temp_med-Parahip_div2	2.06614
uh_Pallidum	2.34496	ah_G_postcentralPost_div1	2.28733	uh_S_front_middle_div2	2.32986	uh_G_front_inf-Orbital	2.00217
ah_S_intrapariet &P_trans_div3	2.34344	uh_G_oc-temp_med-Lingual_div3	2.23733	uh_Pole_temporal_div2	2.30327	uh_G_front_sup_div2	1.96497
uh_S_parieto_occipital_div1	2.30666	ah_M1_div1	2.06465	uh_G_temp_sup-Plan tempo	2.23666	uh_G_parietal_sup_div1	1.84750
ah_Pallidum	2.29875	ah_G_pariet_inf-Supramar_div2	2.03074	uh_S_precentral-sup-partAntdiv1	2.19060	uh_S_precentral-sup-partAntdiv1	1.76615
ah_G_parietal_sup_div4	2.11977	uh_S_collat_transv_ant	1.93933	uh_Thalamus	2.18883	ah_G_occipital_sup_div1	1.73393
uh_S_parieto_occipital_div2	1.92678	ah_S_precentral-sup-partAntdiv2	1.87416	uh_G&S_paracentral_div1	2.11469	ah_G_cuneus_div2	1.65484
ah_S_parieto_occipital_div2	1.92151	ah_G&S_cingul-Mid-Ant_div2	1.85074	uh_PM_div2	2.01399	uh_G_temp_sup-Lateral_div2	1.63709
ah_G_temp_sup-Plan_polar	1.90827	uh_Pallidum	1.75453	uh_G_front_middle_div4	1.97974	ah_S_postcentral_div2	1.61628
ah_Caudate	1.88073	uh_S_collat_transv_post	1.73861	uh_Amygdala	1.87124	ah_G_oc-temp_med-Lingual_div3	1.61471

uh_G_temp_sup-Plan_polar	1.82991	uh_G_parietal_sup_div1	1.69987	uh_G_pariet_inf-Angular_div1	1.83838	ah_M1_div1	1.60257
ah_S_intrapariet&P_trans_div1	1.73279	ah_G_Ins_lg&S_cent_ins_div2	1.56191	uh_PM_div1	1.80355	uh_Lat_Fis-post_div2	1.58648
uh_S_intrapariet&P_trans_div2	1.67602	ah_S1_div4	1.51446	ah_S_temporal_sup_div7	1.67283	ah_S_precentral-sup-partAntdiv2	1.58422
ah_S_calcarine_div1	1.67100	ah_S_parieto_occipital_div2	1.47215	uh_G_front_sup_div1	1.67210	ah_Lat_Fis-post_div1	1.55474
ah_Lat_Fis-post_div2	1.60781	uh_M1_div2	1.45482	uh_S_precentral-sup-partAntdiv2	1.65010	uh_S_front_sup_div2	1.46513
ah_M1_div1	1.58886	ah_Hippocampus	1.43427	BrainStem	1.59827	uh_G&S_paracentral_div2	1.40637
uh_G_temp_sup-Lateral_div2	1.55846	uh_S_temporal_sup_div1	1.38169	uh_G_orbital_div3	1.44357	uh_S_temporal_inf_div2	1.37224
ah_S_circular_insula_inf_div2	1.55429	ah_G_cuneus_div2	1.36462	uh_G_front_sup_div6	1.43406	uh_Hippocampus	1.37046
ah_G_parietal_sup_div1	1.46691	ah_G_pariet_inf-Angular_div3	1.36341	uh_M1_div2	1.39609	uh_G_pariet_inf-Angular_div2	1.36089
uh_S_cingul-Marginalis_div2	1.39797	ah_S_postcentral_div1	1.35420	uh_M1_div4	1.38608	ah_S_oc-temp_lat	1.34190
ah_G_precuneus_div2	1.32629	ah_G_oc-temp_med-Lingual_div3	1.34875	uh_S_orbital_med-olfact	1.38456	ah_S_circular_insula_ant	1.30259
uh_G&S_cingul-Mid-Post_div1	1.30926	uh_S_precentral-sup-partAntdiv1	1.28572	uh_S_temporal_inf_div2	1.35858	ah_S_circular_insula_sup_div1	1.29154
ah_G_front_inf-Opercular_div2	1.30772	ah_G&S_cingul-Ant_div3	1.23020	uh_Caudate	1.34116	ah_G_parietal_sup_div2	1.28637
uh_G_parietal_sup_div2	1.24778	ah_G_insular_short	1.22635	uh_S_front_midle_div1	1.31095	ah_S_collat_transv_post	1.27848
uh_Putamen	1.22854	ah_S1_div2	1.18481	uh_S_temporal_sup_div2	1.30442	ah_G&S_cingul-Mid-Ant_div2	1.26848
ah_PM_div4	1.22140	uh_G&S_subcentral_div2	1.18433	ah_S_circular_insula_inf_div2	1.29766	ah_G&S_cingul-Ant_div3	1.26004
ah_Lat_Fis-ant-Vertical	1.22003	ah_G_front_sup_div6	1.18405	uh_G_occipital_sup_div1	1.26783	ah_S_temporal_sup_div1	1.25222
ah_S_temporal_sup_div4	1.20216	ah_S_pericallosal_div2	1.17618	uh_G_temporal_inf_div1	1.25988	ah_S1_div4	1.23666
uh_PM_div2	1.15361	uh_G_postcentralPost_div2	1.17353	uh_G&S_frontomargin	1.24124	ah_G_cingul-Post-dorsal	1.22004
uh_S_intrapariet&P_trans_div3	1.14891	uh_G_front_sup_div3	1.17298	ah_G_rectus	1.22624	uh_G_front_sup_div3	1.19572
uh_M1_div2	1.14251	ah_Lat_Fis-post_div1	1.14877	uh_S_orbital-H Shaped	1.04764	ah_S1_div2	1.16645
ah_S1_div4	1.10559	uh_G_temp_sup-Lateral_div2	1.11224	ah_M1_div1	1.04411	uh_Pole_occipital_div2	1.16246
ah_S_parieto_occipital_div1	1.07621	ah_S_collat_transv_post	1.11188	uh_PM_div4	1.02942	uh_G_temporal_middle_div3	1.13027
uh_S_circular_insula_inf_div1	1.07535	ah_S_oc-temp_lat	1.09929	ah_Pole_temporal_div1	1.02309	ah_G&S_cingul-Mid-Ant_div1	1.11954
ah_S_intrapariet&P_trans_div4	1.05853	uh_Pole_occipital_div2	1.08644	uh_PM_div3	1.02203	uh_Amygdala	1.09991
uh_Caudate	1.05339	ah_S_oc-temp_med&Lingual_div2	1.07563	uh_G_temporal_inf_div2	1.01742	uh_Accumbens	1.09673
uh_S_circular_insula_inf_div2	1.04407	ah_S_circular_insula_sup_div1	1.06597	uh_G_orbital_div2	1.00015	ah_G_front_inf-Orbital	1.09129

ah_S_circular_i nsula_inf_div1	1.01740	ah_Pallidum	1.06372			ah_G_pariet_inf -Supramar_div1	1.08677
ah_G_front_inf- Triangul	1.01665	uh_S_oc- temp_lat	1.03498			ah_G_front_sup div6	1.05691
ah_G_pariet_inf -Supramar_div2	1.01230	ah_G_temp_sup -Plan tempo	1.01171			uh_S_cingul- Marginalis_div1	1.03198
uh_S_front_inf_ div2	1.00887					ah_G_front_mid dle_div4	1.03003
uh_G_front_mi ddle_div1	1.00197					uh_Pallidum	1.01645
						ah_S_intrapariet &P_trans_div3	-1.00244
						uh_G_precuneu s_div3	-1.00302
						uh_Cerebellum	-1.00558
						uh_G_temp_sup -G T transv	-1.02264
						ah_G&S_transv frontopol	-1.05220
						ah_G_rectus	-1.05607
						ah_M1_div2	-1.05915
uh_S1_div2	-1.02059	ah_G_temporal inf_div3	-1.01371	ah_PM_div1	-1.00492	uh_G_pariet_inf -Angular_div3	-1.07916
ah_G&S_cingul -Ant_div1	-1.02266	uh_G_orbital_di v3	-1.02583	ah_G&S_cingul -Mid-Post_div2	-1.02311	uh_G_Ins_lg&S cent_ins_div2	-1.09800
uh_Cerebellum	-1.06136	uh_S_orbital_m ed-olfact	-1.03975	ah_S_calcarine_ div2	-1.02772	uh_G_front_sup div1	-1.09819
uh_S_circular_i nsula_sup_div1	-1.06449	uh_S_suborbital	-1.05830	ah_G_temp_sup -Plan polar	-1.04653	ah_G_front_sup div5	-1.12273
uh_G_temporal inf_div3	-1.10703	uh_Accumbens	-1.09500	ah_S_temporal_ sup_div1	-1.04883	uh_G_front_mi ddle_div4	-1.13805
ah_G_front_sup div1	-1.11861	uh_G&S_cingul -Mid-Ant_div2	-1.10974	uh_S_oc_middl e&Lunatus	-1.05201	uh_G_orbital_di v3	-1.14114
uh_Pole_occipit al_div1	-1.12055	ah_G&S_parace ntral_div2	-1.12270	uh_G_temp_sup -Lateral_div2	-1.06222	uh_G_oc- temp_med- Lingual_div1	-1.14551
uh_S_orbital- H Shaped	-1.14189	ah_S_front_sup div2	-1.14520	ah_G&S_cingul -Mid-Ant_div1	-1.06749	ah_G_front_mid dle_div3	-1.15407
uh_G_cingul- Post-dorsal	-1.14370	uh_G&S_cingul -Mid-Ant_div1	-1.15114	ah_G_temp_sup -Plan tempo	-1.07885	uh_M1_div3	-1.22937
uh_G&S_subce ntral_div1	-1.14762	uh_S_interm_pr im-Jensen	-1.15550	ah_S_temporal_ sup_div5	-1.08166	ah_G_temporal middle_div2	-1.23901
ah_G&S_cingul -Ant_div2	-1.17115	ah_S_parieto_o ccipital_div1	-1.16524	ah_Lat_Fis- post_div1	-1.08865	ah_G&S_cingul -Ant_div2	-1.24304
ah_G_front_inf- Orbital	-1.25668	uh_Pole_tempor al_div2	-1.16739	ah_S_pericallos al_div2	-1.09061	ah_G_temporal inf_div2	-1.24436
uh_G_occipital_ middle_div1	-1.25749	uh_G_pariet_inf -Supramar_div1	-1.20732	ah_S_front_inf_ div1	-1.13017	uh_G&S_cingul -Mid-Post_div1	-1.24931
ah_S_orbital- H Shaped	-1.27587	uh_G_front_sup div6	-1.24875	ah_S_intrapariet &P_trans_div3	-1.14036	uh_G_orbital_di v2	-1.26099
uh_S_collat_tra nsv_ant	-1.27655	ah_Medial_wall	-1.26349	ah_G&S_cingul -Mid-Post_div1	-1.14893	uh_G_temp_sup -Plan polar	-1.27038
ah_G_temp_sup -Lateral_div1	-1.27771	ah_S1_div3	-1.27207	ah_G_Ins_lg&S cent_ins_div2	-1.18109	ah_S_occipital_ ant	-1.27515
uh_G_pariet_inf -Angular_div3	-1.29507	ah_G_front_mid dle_div3	-1.28125	ah_S1_div3	-1.20855	ah_G_occipital_ sup_div2	-1.27773
ah_G_occipital_ middle_div2	-1.30565	uh_G_pariet_inf -Angular_div1	-1.30183	uh_G_occipital_ middle_div2	-1.21797	uh_G_temporal middle_div2	-1.29636

uh_S_front_mid dle_div2	-1.31536	uh_G_temp_sup -G_T_transv	-1.30727	uh_G_oc- temp_med- Parahip_div2	-1.22180	uh_G_insular_s hort	-1.32640
uh_Pole_tempor al_div2	-1.31794	uh_S_temporal_ sup_div5	-1.38032	ah_G_parietal_s up_div2	-1.22649	ah_S_circular_i nsula_inf_div2	-1.33053
uh_Pole_tempor al_div1	-1.32059	ah_PM_div3	-1.43033	uh_G&S_cingul -Ant_div1	-1.23787	ah_S_front_sup div2	-1.33429
uh_G_oc- temp_lat- fusifor_div2	-1.32745	uh_Thalamus	-1.46714	ah_S_cingul- Marginalis_div2	-1.25910	uh_Lat_Fis- post_div1	-1.40789
uh_S_orbital_m ed-olfact	-1.33592	uh_G_temporal inf_div2	-1.49311	ah_G_orbital_di v3	-1.26397	uh_S_parieto_o ccipital_div1	-1.42529
ah_G_pariet_inf -Supramar_div1	-1.34764	uh_S_oc_sup&t ransversal	-1.51329	ah_G_pariet_inf -Supramar_div2	-1.29028	uh_G_temporal inf_div2	-1.42755
ah_G_front_mid dle_div2	-1.35710	uh_G_temp_sup -Lateral_div1	-1.53815	ah_G_front_inf- Opercular_div2	-1.29149	uh_Thalamus	-1.43304
ah_G_occipital_ middle_div1	-1.35926	ah_S_cingul- Marginalis_div2	-1.55256	uh_G_pariet_inf -Supramar_div4	-1.36087	uh_S_orbital_m ed-olfact	-1.48407
uh_S_circular_i nsula_ant	-1.38995	ah_G_temp_sup -G_T_transv	-1.55921	ah_G_pariet_inf -Angular_div3	-1.36811	uh_S_front_mid dle_div1	-1.56118
uh_G_pariet_inf -Supramar_div3	-1.40329	uh_S_intrapariet &P_trans_div3	-1.57693	ah_S_circular_i nsula_sup_div2	-1.40433	uh_G_front_inf- Opercular_div2	-1.57608
uh_S_oc_sup&t ransversal	-1.40474	uh_S_oc- temp_med&Lin gual_div2	-1.59798	ah_S1_div2	-1.43015	uh_G&S_subce ntral_div1	-1.62461
ah_G_subcallos al	-1.45173	uh_Caudate	-1.60790	ah_G_parietal_s up_div1	-1.45602	ah_M1_div4	-1.63650
uh_G_parietal_s up_div1	-1.48018	uh_G_occipital_ middle_div2	-1.61775	ah_G_pariet_inf -Angular_div2	-1.46272	uh_S_suborbital	-1.65370
uh_G&S_fronto margin	-1.50869	uh_S_temporal_ sup_div4	-1.62035	uh_G_cingul- Post-ventral	-1.47718	uh_S_postcentra l_div3	-1.67442
uh_G_occipital_ middle_div2	-1.55217	ah_S_pericallos al_div1	-1.63084	ah_S_intrapariet &P_trans_div4	-1.48304	uh_S_oc- temp_med&Lin gual_div2	-1.68437
ah_G&S_cingul -Mid-Ant_div2	-1.55572	uh_G_pariet_inf -Angular_div3	-1.63413	ah_S_oc_middl e&Lunatus	-1.50338	ah_G&S_parace ntral_div2	-1.69783
uh_G_oc- temp_med- Lingual_div3	-1.58298	uh_S_parieto_o ccipital_div1	-1.72117	ah_G_oc- temp_med- Lingual_div1	-1.63517	ah_S_temporal_ transverse	-1.71284
ah_G_temporal inf_div2	-1.61923	uh_PM_div3	-1.74855	uh_G_postcentr alPost_div2	-1.67039	ah_S_postcentra l_div1	-1.72059
ah_G_occipital_ sup_div2	-1.63996	uh_G&S_parace ntral_div1	-1.78578	ah_G_oc- temp_med- Lingual_div3	-1.80748	uh_M1_div1	-1.73831
ah_S_pericallos al_div1	-1.64605	ah_S_orbital_m ed-olfact	-1.80152	ah_G_oc- temp_med- Parahip_div1	-1.80817	ah_Pole_tempor al_div1	-1.76088
ah_G_postcentr alPost_div1	-1.69019	uh_G_front_inf- Triangul	-1.80696	ah_S1_div4	-1.82188	uh_Lat_Fis-ant- Horizont	-1.79296
uh_G_oc- temp_med- Parahip_div1	-1.71664	uh_G_temporal _middle_div2	-1.87138	ah_S_oc- temp_med&Lin gual_div1	-1.97846	uh_G_temp_sup -Lateral_div1	-1.92365
ah_S_cingul- Marginalis_div2	-1.75364	uh_M1_div3	-1.89349	ah_G_cuneus_d iv1	-2.04598	uh_S_circular_i nsula_ant	-2.03588
ah_Pole_tempor al_div2	-1.86698	uh_S1_div1	-1.93427	ah_G_oc- temp_med- Parahip_div2	-2.14090	uh_G&S_cingul -Mid-Ant_div2	-2.05833
ah_G&S_cingul -Mid-Post_div1	-2.00464	uh_S_front_mid dle_div1	-1.99208	ah_S_circular_i nsula_ant	-2.17495	uh_PM_div3	-2.06771

uh_G_cingul- Post-ventral	-2.10881	uh_S_temporal_ inf_div1	-2.11534	ah_S_oc- temp_lat	-2.38511	uh_Putamen	-2.12178
uh_G_occipital_ sup_div2	-2.48409	uh_S_postcentra l_div3	-2.56106	ah_S_postcentra l_div2	-2.72837	uh_M1_div4	-2.22353
ah_G_temporal inf_div1	-2.52468	BrainStem	-3.02053	ah_G&S_cingul -Mid-Ant_div2	-2.85145	BrainStem	-2.54727
uh_G_subcallos al	-2.74754	uh_S_temporal_ sup_div7	-3.08311	ah_G_cingul- Post-dorsal	-3.35385	uh_G&S_parace ntral_div1	-2.83624

SOM Table 4 | Z-score of summed feature weights for each area/label of the Destrieux atlas

Area names are based on the Destrieux atlas of parcellation using freesurfer. All lesioned were flipped to the one hemisphere. ah: affected hemisphere, uh: unaffected hemisphere. For details on the labels please see (Destrieux *et al.*, 2010). ah: affected hemisphere; uh: unaffected hemisphere; TA: two weeks after stroke; TC-TA: changes from two weeks to three months after stroke; Div*: The number refers to the parcellation along the longest axis of the respective label

Area	Summed T-score of featured connections
ah Caudate	11.4155
ah S temporal sup div1	9.6710
ah G pariet inf-Supramar div4	8.3830
ah S front middle div2	7.0194
uh G occipital sup div1	5.7631
ah G Ins lg&S cent ins div1	5.5136
ah S postcentral div3	5.1742
ah G&S cingul-Ant div3	5.0781
ah G subcallosal	4.9727
uh S oc sup&transversal	4.9698
ah S intrapariet&P trans div3	4.9170
uh G oc-temp lat-fusifor div2	4.8813
uh S cingul-Marginalis div1	4.8457
ah G occipital sup div1	4.7892
ah S circular insula sup div1	4.5903
ah G&S cingul-Mid-Post div1	4.5220
uh Hippocampus	4.3823
ah S orbital-H Shaped	4.3637
ah S postcentral div1	4.2992
ah G front sup div6	4.1336
uh S calcarine div2	4.0548
ah G front middle div4	4.0353
ah G&S occipital inf	3.5416
ah S front inf div2	3.4093
uh S temporal sup div4	3.3274
ah G front sup div1	3.3252
ah G temp sup-Plan tempo	3.2055
ah G postcentralPost div1	3.1543
ah G&S paracentral div2	3.1164
ah M1 div3	3.0119
ah S postcentral div2	3.0003
uh G occipital middle div1	2.9970
ah S oc middle&Lunatus	2.9387
ah S subparietal div2	2.7301
ah S intrapariet&P trans div2	2.7160
uh S parieto occipital div2	2.6374
ah S cingul-Marginalis div1	2.5792
ah S front sup div1	2.5609
uh G&S subcentral div2	2.5559
uh G postcentralPost div1	2.5495
uh G&S cingul-Mid-Post div1	2.5172
ah G cingul-Post-dorsal	2.5081
ah G orbital div3	2.5005
ah Cerebellum	2.4333
ah G pariet inf-Angular div1	2.4225
uh S postcentral div3	2.3909
ah G temporal middle div2	2.3582
ah S parieto occipital div2	2.3151
uh G temporal inf div3	2.2918
uh S postcentral div1	2.2889
ah M1 div2	2.2794
ah G cuneus div1	2.2701
uh S circular insula sup div1	2.2436
uh G Ins lg&S cent ins div1	2.2425
ah S temporal inf div1	2.2363
ah G cingul-Post-ventral	2.2176

uh S calcarine div3	2.2149
ah S pericallosal div1	2.2094
uh G front sup div1	2.2061
ah S suborbital	2.1997
uh G&S cingul-Mid-Ant div1	2.1966
uh S temporal sup div3	2.1815
ah G front inf-Opercular div1	2.1599
ah S front middle div1	2.1574
ah G precuneus div3	2.1422
ah S circular insula sup div2	2.1411
ah S front inf div1	2.1374
ah Pallidum	2.0844
uh S1 div1	2.0842
uh G cingul-Post-dorsal	2.0771
uh S precentral-inf-partAntdiv2	2.0561
ah S calcarine div3	2.0537
ah S intrapariet&P trans div4	2.0462
ah G temp sup-Plan polar	2.0423
ah G pariet inf-Supramar div2	2.0420
ah G parietal sup div1	2.0391
uh S intrapariet&P trans div5	2.0384
uh S front middle div1	2.0377
ah S temporal sup div3	2.0363
ah G precuneus div1	2.0355
ah G temp sup-Lateral div2	2.0313
ah S temporal sup div5	2.0288
uh G occipital sup div2	2.0245
ah S collat transv ant	2.0224
uh G insular short	2.0187
ah Amygdala	2.0126
ah G pariet inf-Angular div2	2.0102
ah G occipital middle div2	2.0064
ah S temporal sup div4	2.0036
uh G oc-temp med-Parahip div2	1.9992
uh S oc middle&Lunatus	1.2098
ah G&S cingul-Mid-Ant div1	1.2078
uh S postcentral div4	0.5574
ah G parietal sup div4	0.1730
ah M1 div1	-0.0117
ah G Ins lg&S cent ins div2	-0.3098
ah G oc-temp lat-fusifor div1	-1.4351
ah S parieto occipital div1	-1.8521
ah Accumbens	-2.0227
ah S calcarine div2	-2.0286
ah G pariet inf-Supramar div3	-2.0305
uh S parieto occipital div1	-2.0359
uh G oc-temp lat-fusifor div1	-2.0559
uh G oc-temp med-Lingual div2	-2.0865
ah G temporal inf div2	-2.0951
ah PM div1	-2.1274
ah G oc-temp med-Lingual div3	-2.2585
ah G pariet inf-Angular div3	-2.2897
uh Pole occipital div1	-2.3057
uh S occipital ant	-2.5258
ah Putamen	-2.6868
ah G front inf-Triangul	-2.7071
uh S collat transv ant	-2.7278
uh G precuneus div3	-3.0473

ah G occipital sup div2	-4.3791
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SOM Table 5 | summed T-score for longitudinal FA changes in connections features in the SVM model

T-score of the comparison between FA values of connections between TC and TA. Only connection, which were included in the classifier as features, were chosen for this analysis. T-scores of all connections to one specific area were summed up. Lesions were flipped to one hemisphere. Positive values represent a decrease of FA over time.

ah: affected hemisphere, uh: unaffected hemisphere. For details on the labels please see (Destrieux *et al.*, 2010). ah: affected hemisphere; uh: unaffected hemisphere; Div*: The number refers to the parcellation along the longest axis of the respective label

2 weeks after stroke				2 weeks - 3 months after stroke			
Negative features		Positive features		Negative features		Positive features	
Area	Nr. of connections	Area	Nr. of connections	Area	Nr. of connections	Area	Nr. of connections
uh_S1_div3	10	BrainStem	12	uh_G_temp_sup-Lateral_div2	3	BrainStem	9
uh_G_cingul-Post-dorsal	10	uh_Thalamus	9	ah_G_front_midle_div3	2	uh_G_cingul-Post-dorsal	5
uh_G_front_midle_div2	9	uh_G_parietal_sup_div3	6	uh_S1_div3	2	uh_G_front_sup_div4	5
uh_G_front_inf-Opercular_div1	8	ah_Thalamus	6	uh_G_cingul-Post-dorsal	2	uh_G_temp_sup-Lateral_div2	4
uh_S_front_sup_div1	8	ah_G_temp_sup-Lateral_div2	6	uh_S_subparietal_div2	2	ah_S_precentral-inf-partAntdiv1	4
uh_S_precentral-inf-partAntdiv1	8	ah_M1_div4	5	ah_S_precentral-inf-partAntdiv1	2	uh_Cerebellum	4
uh_G_pariet_inf-Supramar_div2	7	ah_PM_div3	5	uh_S_intrapariet&P_trans_div1	2	uh_G_orbital_div2	4
ah_Accumbens	7	uh_G_subcallosal	4	uh_Pallidum	1	ah_G_front_midle_div3	3
ah_S_front_inf_div1	7	uh_Pallidum	4	uh_G_pariet_inf-Supramar_div3	1	uh_S1_div3	3
uh_M1_div4	6	uh_Caudate	4	ah_Cerebellum	1	uh_S_subparietal_div2	3
uh_G_front_sup_div3	6	uh_Putamen	4	uh_G_front_inf-Triangul	1	uh_Pallidum	3
uh_S_temporal_sup_div3	6	uh_G_front_sup_div2	3	uh_M1_div3	1	uh_G_front_sup_div1	3
ah_S_front_sup_div1	6	uh_G_pariet_inf-Supramar_div3	3	uh_S1_div4	1	uh_G_occipital_sup_div2	3
ah_S_temporal_inf_div1	6	uh_G_parietal_sup_div4	3	uh_G_front_sup_div1	1	uh_S_calcarine_div2	3
uh_Cerebellum	5	ah_Cerebellum	3	uh_G_occipital_sup_div2	1	uh_G_temp_sup-Plan_polar	3
uh_G_front_inf-Triangul	5	uh_Hippocampus	3	uh_G_front_midle_div2	1	uh_Thalamus	3
uh_G_front_sup_div2	5	uh_Accumbens	3	uh_G_front_inf-Opercular_div1	1	uh_G_postcentralPost_div2	3
uh_G_front_sup_div4	5	ah_Putamen	3	uh_G_front_sup_div4	1	uh_S_calcarine_div1	3
uh_Pole_temporal_div2	5	uh_G_front_inf-Triangul	2	uh_G_pariet_inf-Angular_div1	1	uh_S_intrapariet&P_trans_div1	2
uh_G_temporal_inf_div1	5	uh_Pole_temporal_div2	2	ah_M1_div2	1	uh_G_front_inf-Triangul	2
uh_S_temporal_inf_div2	5	uh_G_temporal_inf_div1	2	ah_G_front_inf-Orbital	1	uh_M1_div3	2
uh_S_temporal_sup_div6	5	uh_G_cingul-Post-ventral	2	uh_G_front_sup_div5	1	uh_G_pariet_inf-Angular_div1	2
uh_G_pariet_inf-Angular_div1	5	ah_G_orbital_div3	2	uh_G&S_subcentral_div2	1	uh_G&S_subcentral_div2	2
uh_G_pariet_inf-Supramar_div3	5	ah_S_temporal_sup_div1	2	uh_G_postcentralPost_div3	1	ah_G_front_inf-Triangul	2
uh_G_cingul-Post-ventral	5	uh_M1_div3	2	uh_G_orbital_div1	1	ah_S_temporal_sup_div4	2
ah_Amygdala	5	uh_S_orbital_med-olfact	2	ah_G_front_inf-Triangul	1	uh_S_precentral-sup-partAntdiv2	2

ah_S_temporal_sup_div4	5	uh_G_front_middle_div1	2	uh_S_pericallosal_div2	1	uh_S_circular_insula_inf_div1	2
uh_G&S_fronto-margin	4	uh_S1_div4	2	ah_G_pariet_inf-Supramar_div1	1	ah_G_front_sup_div5	2
uh_S_orbital-H Shaped	4	uh_G_parietal_sup_div1	2	ah_S_temporal_sup_div4	1	uh_G_temporal_inf_div3	2
uh_G_orbital_div2	4	uh_G_parietal_sup_div2	2	uh_S_orbital-H Shaped	1	ah_Thalamus	2
uh_S_precentral-inf-partAntdiv2	4	uh_M1_div1	2	uh_S_precentral-inf-partAntdiv2	1	ah_G_temp_sup-Lateral_div2	2
uh_G_temp_sup-Plan tempo	4	uh_G_front_inf-Opercular_div2	2	uh_G_pariet_inf-Angular_div3	1	ah_PM_div3	2
uh_G_temporal_middle_div2	4	uh_G_front_sup_div1	2	uh_G_precuneus_div3	1	uh_Accumbens	2
uh_G_temporal_middle_div3	4	uh_G&S_parencentral_div2	2	uh_S_calcarine_div2	1	ah_Putamen	2
uh_S_interm_prim-Jensen	4	ah_G&S_transv_frontopol	2	uh_Lat Fis-post div2	1	ah_Pole_temporal_div1	2
uh_G_parietal_sup_div4	4	ah_G_front_middle_div1	2	ah_S_front_middle_div2	1	ah_Pallidum	2
uh_G_pariet_inf-Angular_div3	4	ah_G_parietal_sup_div1	2	ah_G_temp_sup-Plan tempo	1	ah_G_front_sup_div3	2
uh_G_precuneus_div3	4	uh_G_front_middle_div4	2	uh_S_precentral-sup-partAntdiv2	1	ah_G_parietal_sup_div4	2
uh_S_subparietal_div2	4	uh_Pole_occipital_div1	2	uh_G_temp_sup-Plan polar	1	uh_G_orbital_div3	2
uh_S_collat_transv_ant	4	uh_G&S_cingul-Ant_div2	2	uh_S_circular_insula_inf_div1	1	ah_Caudate	2
uh_S_calcarine_div2	4	uh_G&S_cingul-Mid-Post div1	2	uh_G_temp_sup-G T transv	1	ah_G_parietal_sup_div3	2
uh_G_subcallosal	4	ah_G_front_inf-Opercular_div2	2	uh_G_temp_sup-Lateral div1	1	uh_S_parieto_occipital_div1	2
uh_Lat Fis-post div2	4	ah_Pole_temporal_div1	2	ah_G_front_sup_div5	1	uh_G_temp_sup-Plan tempo	2
uh_G_insular_short	4	ah_G_temporal_inf_div2	2	ah_S_subparietal_div2	1	uh_G&S_cingul-Mid-Post div2	2
uh_G_Ins_lg&S_cent_ins_div2	4	ah_S_temporal_sup_div6	2	uh_G_temporal_inf_div3	1	uh_PM_div1	2
ah_M1_div2	4	ah_S1_div3	2	uh_S_postcentral_div4	1	ah_G_front_sup_div6	2
ah_G_front_inf-Orbital	4	ah_G_pariet_inf-Supramar_div2	2	uh_S_cingul-Marginalis div2	1	uh_G_pariet_inf-Supramar_div3	1
ah_G_orbital_div3	4	uh_G_occipital_sup_div2	2	ah_S_orbital_medd-olfact	1	ah_Cerebellum	1
ah_S_front_middle_div2	4	ah_Pallidum	2	ah_S_front_sup_div2	1	uh_S1_div4	1
ah_S_precentral-inf-partAntdiv2	4	ah_PM_div4	2			uh_G_front_middle_div2	1
ah_G_temp_sup-Plan tempo	4	ah_G&S_subcentral_div1	2			uh_G_front_inf-Opercular_div1	1
ah_S_temporal_sup_div1	4	ah_S_oc_sup&transversal	2			ah_M1_div2	1
ah_S_temporal_sup_div5	4	uh_G_front_middle_div2	1			ah_G_front_inf-Orbital	1
ah_S_postcentral_div4	4	uh_G_front_inf-Opercular_div1	1			uh_G_front_sup_div5	1
uh_M1_div2	3	ah_S_temporal_inf_div1	1			uh_G_postcentralPost_div3	1

uh_M1_div3	3	uh_G_front_sup_div4	1			uh_G_orbital_div1	1
uh_PM_div2	3	uh_G_pariet_inf-Angular_div1	1			uh_S_pericallosal_div2	1
uh_PM_div4	3	uh_G&S_fronto-margin	1			ah_G_pariet_inf-Supramar_div1	1
uh_S_orbital_med-olfact	3	uh_G_temporal_middle_div2	1			uh_S_orbital-H Shaped	1
uh_G_front_middle_div1	3	uh_G_temporal_middle_div3	1			uh_S_precentral-inf-partAntdiv2	1
uh_G_front_sup_div5	3	uh_G_insular_short	1			uh_G_pariet_inf-Angular_div3	1
uh_S_front_inf_div1	3	ah_M1_div2	1			uh_G_precuneus_div3	1
uh_S_precentral-sup-partAntdiv2	3	ah_G_front_inf-Orbital	1			uh_Lat_Fis-post_div2	1
uh_G&S_subcentral_div2	3	uh_M1_div2	1			ah_S_front_middle_div2	1
uh_G_temp_sup-Plan_polar	3	uh_G_front_sup_div5	1			ah_G_temp_sup-Plan_tempo	1
uh_G_temp_sup-Lateral_div2	3	uh_G&S_subcentral_div2	1			uh_G_temp_sup-G T transv	1
uh_S_temporal_sup_div4	3	uh_G_temp_sup-Lateral_div2	1			uh_G_temp_sup-Lateral_div1	1
uh_S1_div2	3	uh_S1_div2	1			ah_S_subparietal_div2	1
uh_S1_div4	3	uh_G_postcentralPost_div3	1			uh_S_postcentral_div4	1
uh_G_parietal_sup_div1	3	uh_G&S_cingul-Mid-Ant_div2	1			uh_S_cingul-Marginalis_div2	1
uh_G_parietal_sup_div2	3	uh_G_orbital_div1	1			ah_S_orbital_med-olfact	1
uh_G_pariet_inf-Angular_div2	3	uh_G_front_sup_div6	1			ah_S_front_sup_div2	1
uh_G_postcentralPost_div3	3	uh_S_front_inf_div2	1			uh_G_parietal_sup_div3	1
uh_S_intrapariet&P_trans_div2	3	uh_G&S_subcentral_div1	1			uh_G_front_sup_div2	1
uh_S_intrapariet&P_trans_div3	3	uh_S_temporal_sup_div2	1			uh_G_temporal_inf_div1	1
uh_S_intrapariet&P_trans_div5	3	uh_G_precuneus_div2	1			uh_G_cingul-Post-ventral	1
uh_S_postcentral_div3	3	uh_G_occipital_middle_div1	1			uh_G_front_middle_div1	1
uh_G&S_cingul-Ant_div1	3	uh_G&S_cingul-Ant_div3	1			uh_G_parietal_sup_div1	1
uh_G&S_cingul-Mid-Ant_div2	3	uh_S_circular_insula_sup_div2	1			uh_G_front_inf-Opercular_div2	1
uh_G&S_cingul-Mid-Post_div2	3	uh_S_parieto-occipital_div3	1			uh_G&S_parietral_div2	1
uh_S_pericallosal_div1	3	ah_G_front_inf-Opercular_div1	1			uh_G_front_middle_div4	1
uh_S_circular_insula_inf_div1	3	ah_G_front_middle_div3	1			uh_Pole_occipital_div1	1
uh_G_oc-temp_med-Lingual_div1	3	ah_G_front_sup_div3	1			uh_G&S_cingul-Ant_div2	1

ah_Cerebellum	3	ah_S_front_inf_div2	1			ah_G_temporal_inf_div2	1
ah_M1_div3	3	ah_G_temp_sup-Lateral_div1	1			ah_G_pariet_inf-Supramar_div2	1
ah_G_orbital_div2	3	ah_S1_div2	1			uh_G_temporal_middle_div3	1
ah_S_precentral-inf-partAntdiv1	3	ah_G_parietal_sup_div4	1			uh_M1_div2	1
uh_Pallidum	2	uh_G&S_transv_frontopol	1			uh_G&S_transv_frontopol	1
uh_M1_div1	2	uh_G_rectus	1			uh_G_temporal_inf_div2	1
uh_PM_div1	2	uh_G_orbital_div3	1			uh_G&S_parcenral_div1	1
uh_G_orbital_div1	2	uh_G_temporal_inf_div2	1			uh_G_occipital_sup_div1	1
uh_G_front_inf-Opercular_div2	2	uh_G&S_parcenral_div1	1			ah_S_orbital-H Shaped	1
uh_G_front_middle_div3	2	uh_G_postcentralPost_div2	1			ah_G_front_middle_div4	1
uh_G_front_sup_div1	2	uh_G_occipital_middle_div2	1			ah_G&S_subcentral_div2	1
uh_G_front_sup_div6	2	uh_G_occipital_sup_div1	1			ah_Pole_temporal_div2	1
uh_S_front_inf_div2	2	ah_Caudate	1			uh_S_front_middle_div2	1
uh_S_precentral-sup-partAntdiv1	2	ah_G_front_inf-Triangul	1			uh_S_precentral-inf-partAntdiv1	1
uh_G&S_subcentral_div1	2	ah_S_orbital-H Shaped	1			ah_S_front_inf_div1	1
uh_Pole_temporal_div1	2	ah_G_front_middle_div4	1			uh_M1_div4	1
uh_G_temp_sup-G_T_transv	2	ah_G_front_sup_div1	1			uh_G_front_sup_div3	1
uh_G_temp_sup-Lateral_div1	2	ah_S_precentral-sup-partAntdiv2	1			uh_S_collat_transv_ant	1
uh_S_temporal_inf_div1	2	ah_G&S_subcentral_div2	1			uh_PM_div2	1
uh_S_temporal_sup_div1	2	ah_Pole_temporal_div2	1			uh_S_front_inf_div1	1
uh_S_temporal_sup_div2	2	ah_G_temporal_middle_div1	1			uh_G&S_cingul-Ant_div1	1
uh_S_temporal_sup_div5	2	ah_S_temporal_sup_div2	1			uh_G_oc-temp_med-Lingual_div1	1
uh_S_temporal_sup_div7	2	ah_G&S_parcenral_div1	1			uh_G_front_middle_div3	1
uh_S_temporal_transverse	2	ah_G_parietal_sup_div3	1			uh_Pole_temporal_div1	1
uh_G&S_parcenral_div2	2	ah_G_occipital_sup_div2	1			uh_G_pariet_inf-Supramar_div4	1
uh_G_pariet_inf-Supramar_div4	2	uh_S_front_middle_div2	1			uh_S_intrapariet&P_trans_div4	1
uh_G_precuneus_div2	2	uh_G_pariet_inf-Supramar_div1	1			uh_S_cingul-Marginalis_div1	1
uh_S_intrapariet&P_trans_div4	2	uh_S_postcentral_div1	1			uh_G_oc-temp_lat-fusifor_div2	1

uh_S_subparietal_div1	2	uh_S_pericallosal_div2	1			ah_PM_div1	1
uh_G_cuneus_div2	2	uh_S_parieto-occipital_div1	1			ah_G_orbital_div1	1
uh_G_occipital_middle_div1	2	uh_S_parieto-occipital_div2	1			ah_G_front_sup_div4	1
uh_Hippocampus	2	uh_S_oc-temp_lat	1			ah_S_temporal_sup_div3	1
uh_G&S_cingul-Ant_div3	2	ah_G&S_frontomargin	1			uh_PM_div3	1
uh_S_cingul-Marginalis_div1	2	ah_G_temp_sup-Plan_polar	1			uh_S_front_middle_div1	1
uh_S_circular_insula_ant	2	ah_G_temporal_inf_div3	1			uh_Pole_occipital_div2	1
uh_S_circular_insula_sup_div2	2	ah_S_temporal_inf_div2	1			uh_S_collat_transv_post	1
uh_S_parieto-occipital_div3	2	ah_G_parietal_sup_div2	1			uh_G_oc-temp_med-Lingual_div2	1
uh_G_oc-temp_lat-fusifor_div2	2	ah_G_pariet_inf-Angular_div2	1			uh_S_postcentral_div2	1
uh_G_oc-temp_med-Parahip_div2	2	ah_G_pariet_inf-Supramar_div1	1			uh_G&S_occipital_inf	1
uh_S_oc-temp_med&Lingual_div1	2	ah_G_pariet_inf-Supramar_div3	1			uh_S_circular_insula_inf_div2	1
ah_PM_div1	2	ah_G&S_occipital_inf	1			ah_PM_div2	1
ah_G&S_transv_frontopol	2	ah_S_collat_transv_ant	1			ah_Pole_occipital_div2	1
ah_G_orbital_div1	2	ah_G_occipital_middle_div1	1			ah_G_cuneus_div2	1
ah_G_front_inf-Opercular_div1	2	ah_G_occipital_sup_div1	1			ah_G&S_cingul-Ant_div2	1
ah_G_front_middle_div1	2	ah_G_insular_short	1				
ah_G_front_middle_div2	2	ah_S_oc-temp_lat	1				
ah_G_front_middle_div3	2	ah_G_oc-temp_lat-fusifor_div1	1				
ah_G_front_sup_div3	2						
ah_G_front_sup_div4	2						
ah_G_front_sup_div5	2						
ah_S_front_inf_div2	2						
ah_S_front_middle_div1	2						
ah_G_temp_sup-G_T_transv	2						
ah_G_temp_sup-Lateral_div1	2						
ah_G_temporal_inf_div1	2						

ah_S_temporal_sup_div3	2						
ah_S1_div1	2						
ah_S1_div2	2						
ah_G_parietal_sup_div1	2						
ah_G_parietal_sup_div4	2						
ah_S_subparietal_div2	2						
ah_S_oc_middle&Lunatus	2						
ah_G&S_cingul-Ant_div1	2						
ah_S_cingul-Marginalis_div2	2						
uh_Caudate	1						
uh_Putamen	1						
uh_Accumbens	1						
uh_PM_div3	1						
uh_G&S_transv_frontopol	1						
uh_G_front_inf-Orbital	1						
uh_G_rectus	1						
uh_G_orbital_div3	1						
uh_S_suborbital	1						
uh_G_front_middle_div4	1						
uh_S_front_middle_div1	1						
uh_S_front_sup_div2	1						
uh_Amygdala	1						
uh_G_temporal_inf_div2	1						
uh_G_temporal_inf_div3	1						
uh_G_temporal_middle_div1	1						
uh_G&S_parcenral_div1	1						
uh_G_precuneus_div1	1						
uh_G_postcentralPost_div1	1						
uh_G_postcentralPost_div2	1						
uh_S_intraparietal&P_trans_div1	1						
uh_S_postcentral_div4	1						
uh_Pole_occipital_div1	1						
uh_Pole_occipital_div2	1						
uh_S_collat_transv_post	1						

uh_S_occipital_ant	1						
uh_S_calcarine_div3	1						
uh_G_occipital_middle_div2	1						
uh_G_occipital_sup_div1	1						
uh_G&S_cingul-Ant_div2	1						
uh_G&S_cingul-Mid-Post_div1	1						
uh_S_cingul-Marginalis_div2	1						
uh_Lat_Fis-ant-Horizont	1						
uh_Lat_Fis-ant-Vertical	1						
uh_Lat_Fis-post_div1	1						
uh_G_oc-temp_med-Lingual_div2	1						
uh_S_oc-temp_med&Lingual_div2	1						
ah_Caudate	1						
ah_M1_div4	1						
ah_PM_div3	1						
ah_G_front_inf-Triangul	1						
ah_G_rectus	1						
ah_S_orbital_med-olfact	1						
ah_S_orbital-H Shaped	1						
ah_S_suborbital	1						
ah_G_front_inf-Opercular_div2	1						
ah_G_front_middle_div4	1						
ah_G_front_sup_div1	1						
ah_S_front_sup_div2	1						
ah_S_precentral-sup-partAntdiv2	1						
ah_G&S_subcentral_div2	1						
ah_Pole_temporal_div1	1						
ah_Pole_temporal_div2	1						
ah_G_temporal_inf_div2	1						
ah_G_temporal_middle_div1	1						
ah_G_temporal_middle_div2	1						

ah_G_temporal_middle_div3	1						
ah_S_temporal_sup_div2	1						
ah_S_temporal_sup_div6	1						
ah_S_temporal_sup_div7	1						
ah_S_temporal_transverse	1						
ah_S1_div3	1						
ah_G&S_parcenral_div1	1						
ah_G_parietal_sup_div3	1						
ah_G_pariet_inf-Angular_div3	1						
ah_G_pariet_inf-Supramar_div2	1						
ah_G_pariet_inf-Supramar_div4	1						
ah_G_precuneus_div3	1						
ah_G_postcentralPost_div3	1						
ah_S_intrapariet&P_trans_div1	1						
ah_S_intrapariet&P_trans_div2	1						
ah_S_intrapariet&P_trans_div3	1						
ah_S_postcentral_div2	1						
ah_S_subparietal_div1	1						
ah_G_occipital_sup_div2	1						
ah_Hippocampus	1						
ah_G&S_cingul-Mid-Ant_div1	1						
ah_G&S_cingul-Mid-Ant_div2	1						
ah_G&S_cingul-Mid-Post_div1	1						
ah_G&S_cingul-Mid-Post_div2	1						
ah_S_pericallosal_div1	1						

SOM Table 6 | Permutation analyses revealing connectivity specificity of parcellated areas for severely impaired patients.

10000 permutations were performed and those connections considered as specifically contributing to the distinction between fitters and non-fitters for severely impaired patients, when they were picked up in less than 5% of permutations.

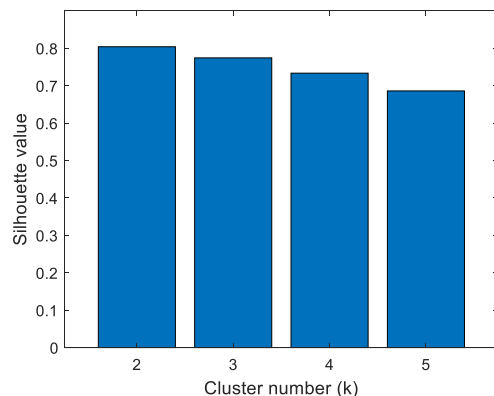
For each area those connections were summed up, indicating parcellated areas, which connections showed specificity in severely impaired patients. This was performed for both

positive and negative features at two weeks as well as the white matter change over time. Lesions were flipped to one hemisphere. ah: affected hemisphere, uh: unaffected hemisphere. For details on the labels please see (Destrieux *et al.*, 2010); Div*: The number refers to the parcellation along the longest axis of the respective label

K-Means Clustering

In the present k-means clustering, we set k to 2 since we were primarily interested in two possible recovery subgroups of natural recovery (“fitters”) and reduced natural recovery (“nonfitters”) as defined in e.g., Winters *et al.*’s study (Winters *et al.*, 2015) and as such a separation of patients might have a strong value on personalization of further treatment steps. Except for the hypothesis that data points have been generated from k exact centroid clusters, there are no restrictions on the use of k-means clustering. Methodologically, we applied the following approach. For k-means clustering, we have used the function ‘kmeans’ included in the Statistics and Machine Learning Toolbox of MATLAB. With the function, centroid clusters were computed in terms of squared Euclidean distance such that each centroid is the mean of the data points in the respective cluster. For $k = 2$, the k-means clustering algorithm was bound to converge to a solution when two centroids were randomly initialized and maximally 100 iterations were performed.

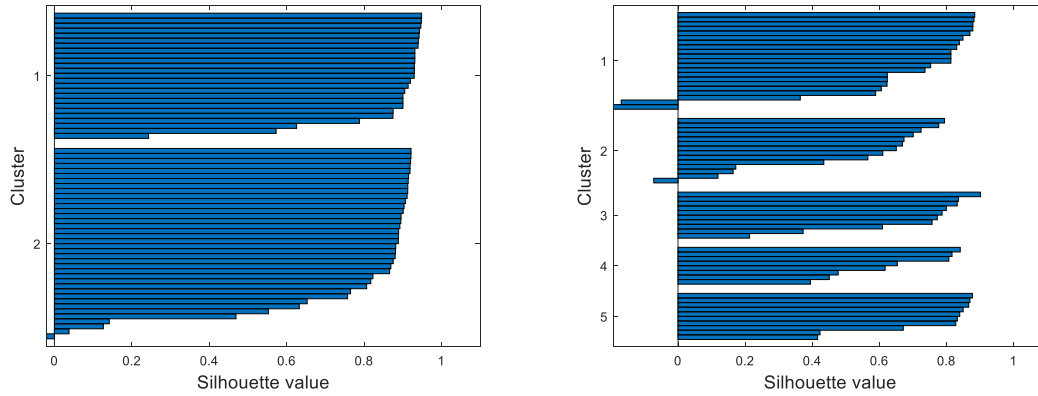
The optimal k was 2 by comparing clustering solutions for different k’s. One of the popular ways to determine the number of clusters in such an approach is using the silhouette value (Rousseeuw, 1987), a measure of how similar data points are to its own cluster compared to other clusters. It ranges between -1 and +1, in which higher values indicate objects being closer to its own and further away from different clusters. When the optimal k was searched by comparing silhouette values for different k’s between 2 and 5, the maximum silhouette value was obtained for $k = 2$, indicating that the optimal k for the present analyses was 2, as can be further appreciated in SOM figure 5.



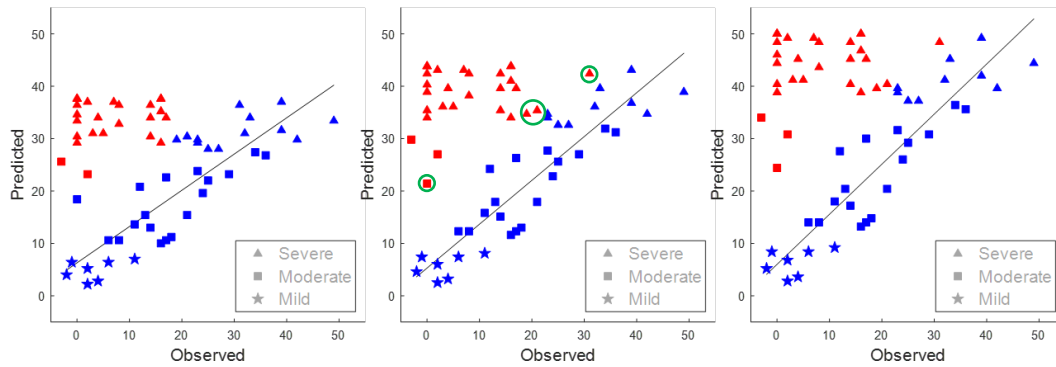
SOM Figure 5 | Selection of the optimal k by comparing silhouette values

Indeed, when silhouette plots were displayed for $k = 2$ (left panel) and $k = 5$ (right panel) in figure 2, silhouette values were generally greater for $k = 2$ than for $k = 5$ (please see SOM figure 6), indicating that the clusters were better separated for $k = 2$ than for $k = 5$.

When considering different slope values for the predicted proportional recovery, majority of patients were still assigned to the same cluster



SOM Figure 6 | Comparison of silhouette values between $k = 2$ (left panel) and $k = 5$ (right panel).



SOM Figure 7 | Clustering of patients for slope values of 0.6 (left panel), 0.7 (middle panel), and 0.8 (right panel) of the proportional recovery model. Changes in the classification are highlighted by green circles in the middle plane.

		Proportional motor recovery	
		Fitter	Nonfitter
MEP status	Presence	14	0
	Absence	18	17

SOM Table 7 | Confusion matrix between MEP status and proportional motor recovery.

Differences in structural connectivity relations to initial severity and recovery.

Whole-brain structural connectomes can be used not only for predicting motor outcomes, but also for predicting symptom severity.

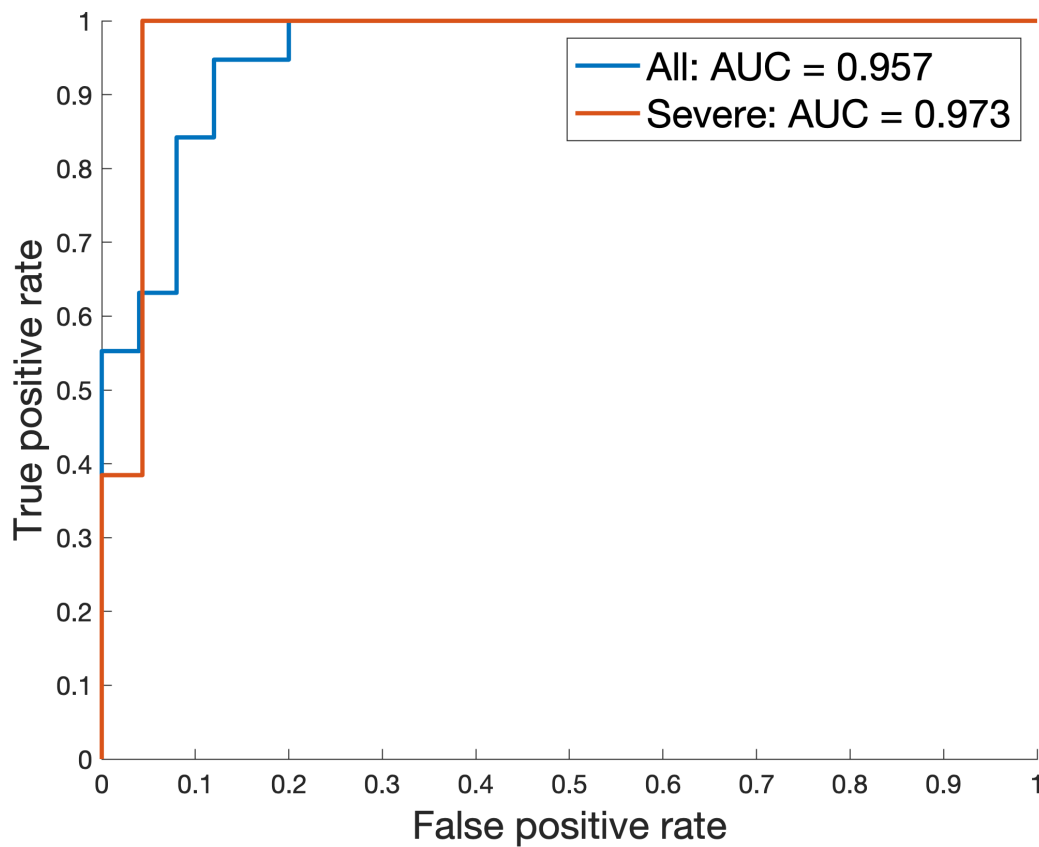
When we constructed an SVM model for predicting "severe" ($FMUE \leq 20$) vs. "moderate" ($FMUE > 20$) symptoms by employing the same approach, its performance was comparable to the SVM model for predicting fitters vs. nonfitters, as exhibited in Table 7.

However, it is of importance to point out that the SVM model for predicting moderate vs severe symptoms uses clearly different features e.g., in regard of number, overlap of features and features weights, compared to the SVM model for predicting fitters vs. nonfitters. Specifically,

only 490 features were common between 1,765 features for predicting fitters vs. nonfitters and 2,676 features for predicting moderate vs severe symptoms.

Classifier	# of features	Accuracy	Precision
Fitter vs. nonfitter	1,765	0.83	0.87
Severe vs. moderate	2,676	0.87	0.87

SOM Table 8 | Comparison of classification performance between two classifiers (Initial impairment vs. recovery)



SOM Figure 8 | Receiver Operating Characteristics and Area under the Curve for the predictive value of the TA connectome in all SEOUL patients (blue) as well as severely impaired (red)

	CST + initial impairment	Network
All TA	0.6032	0.6032
All TC-TA.	0.7143	0.5873
Severe TA	0.6667	0.6389
Severe TC-TA.	0.6389	0.6389

Supplementary Table 9 SVM Modeling for different network markers

Accuracy measures determined by cross validation of SVM classifiers using the CST integrity with the initial impairment as features, as well as different network summary measures (density, characteristic path length, clustering coefficient, participation coefficient, assortativity, modularity, and small-world-ness).

SOM References:

Destrieux C, Fischl B, Dale A, Halgren E. Automatic parcellation of human cortical gyri and sulci using standard anatomical nomenclature. *Neuroimage* 2010; 53: 1–15.

Rousseeuw PJ. Silhouettes: A graphical aid to the interpretation and validation of cluster analysis. *J Comput Appl Math* 1987; 20: 53–65.

Winters C, van Wegen EEH, Daffertshofer A, Kwakkel G. Generalizability of the Proportional Recovery Model for the Upper Extremity After an Ischemic Stroke. *Neurorehabil Neural Repair* 2015; 29: 614–22.