

**Supplementary Table e-1 – Baseline characteristics in matched cohorts.**

	Original cohort							Matched sub-cohort						
	STN-DBS			MED			<i>p</i> <sup>a</sup>	STN-DBS			MED			<i>p</i> <sup>a</sup>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>		<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	
SCOPA-tremor	66	20.6	21.0	84	15.9	19.0	.156	37	23.4	23.7	38	18.6	22.3	.359
SCOPA-axial symptoms	65	27.8	17.4	84	27.8	17.4	.761	37	24.2	17.4	38	32.2	18.4	<b>.043</b>
SCOPA-dysphagia and dysarthria	65	25.3	14.9	84	18.8	12.1	<b>.004</b>	37	21.0	15.2	38	21.9	12.0	.696
SCOPA-bradykinesia	66	41.9	18.7	84	35.9	17.8	<b>.031</b>	37	39.6	19.9	38	43.9	17.2	.503
SCOPA-dyskinesia	66	35.1	30.7	84	17.7	22.9	<b>&lt;.001</b>	38	24.6	27.9	38	22.4	25.2	.802
SCOPA-ON/OFF fluctuations	66	43.9	27.4	84	33.3	15.7	<b>.001</b>	38	35.5	28.3	38	33.8	18.0	.672
MMSE (range 0–30)	67	29.1	1.0	83	28.7	1.5	.196	38	29.2	0.9	38	28.8	1.6	.459

**Legend:** SCOPA subscores are presented as percentage of maximum domain score.

<sup>a</sup>Mann-Whitney U test or t test, when parametric test criteria were fulfilled.

Tremor subscore was based on items 1 and 2; axial subscore on items 5, 6, 7, 9, 15, and 16; bradykinesia subscore on items 3 and 4; dysphagia and dysarthria subscore on items 8, 10, and 11; dyskinesia subscore on items 18 and 19; and ON/OFF fluctuations subscore on items 20 and 21.

**Abbreviations:** MED = standard-of-care medical treatment; MMSE = Mini-Mental State Examination; SCOPA = Scales for Outcomes in Parkinson's disease; STN-DBS = subthalamic nucleus deep brain stimulation.

**Supplementary Table e-2 – Outcomes at baseline and follow-up in subthalamic stimulation, and medical treatment group in the original cohort**

	STN-DBS (n=67)						MED (n=84)						STN-DBS vs. MED <sup>b</sup>
	Baseline		36-MFU		Baseline vs. 36-MFU <sup>a</sup>	Baseline		36-MFU		Baseline vs. 36-MFU <sup>a</sup>			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>p</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>p</i>	
NMSS total score	67	60.6	36.0	51.0	38.9	<b>.041</b>	83	46.0	25.3	52.0	34.0	.294	<b>.026</b>
NMSS domains													
Cardiovascular	67	1.4	2.3	2.2	3.5	.064	84	1.0	1.9	1.3	2.4	.459	.633
Sleep/fatigue	67	14.7	10.1	10.3	8.8	<b>.001</b>	84	9.2	8.6	9.7	8.8	.734	<b>.003</b>
Mood/apathy	67	6.5	11.2	8.8	12.0	.074	84	6.7	8.4	7.2	11.6	.861	.118
Perceptual problems/hallucinations	67	1.2	3.1	1.3	2.6	.482	84	1.1	2.3	1.9	3.3	<b>.036</b>	.529
Attention/memory	67	5.0	6.2	5.7	6.6	.309	84	4.6	5.3	5.8	7.1	.169	.977
Gastrointestinal	67	5.8	7.3	6.2	5.8	.424	84	4.6	5.3	6.4	6.6	<b>.017</b>	.327
Urinary	67	11.5	9.7	9.3	9.4	<b>.023</b>	84	7.3	6.8	9.1	9.0	.117	<b>.002</b>
Sexual function	67	3.4	5.2	2.1	4.6	.052	84	4.2	5.8	3.0	5.5	.106	.582
Miscellaneous	67	10.9	9.1	5.1	5.7	<b>&lt;.001</b>	83	7.9	6.1	7.4	7.5	.513	<b>.004</b>
PDQ-8 SI	67	32.8	18.5	30.7	21.0	.354	84	26.2	15.4	32.0	18.0	<b>.024</b>	<b>.018</b>
SCOPA-motor examination	67	11.6	5.2	9.1	5.1	<b>.002</b>	84	10.1	4.6	11.1	5.4	.254	<b>&lt;.001</b>
SCOPA-activities of daily living	67	6.9	3.4	6.9	3.9	.753	84	6.4	3.0	7.0	4.1	.287	.257
SCOPA-motor complications	67	4.8	3.1	2.5	2.6	<b>&lt;.001</b>	84	3.1	1.7	3.2	2.5	.741	<b>&lt;.001</b>
LEDD (mg)	67	1199.1	587.5	770.7	509.7	<b>&lt;.001</b>	84	778.1	407.1	908.1	478.6	<b>.024</b>	<b>&lt;.001</b>

**Legend:** Outcome parameters at baseline and follow-up for STN-DBS and MED groups. Multiple comparisons due to multiple outcome parameters were corrected with Benjamini-Hochberg's method. Post-hoc exploratory analyses were performed for NMSS domains.

**Abbreviations:** 36-MFU = 36-month follow-up; LEDD = levodopa equivalent daily dose; MED = standard-of-care medical treatment; NMSS = Non-motor Symptom Scale; PDQ-8 SI = 8-item Parkinson's Disease Questionnaire Summary Index; SCOPA = Scales for Outcomes in Parkinson's disease; STN-DBS = subthalamic nucleus deep brain stimulation.

<sup>a</sup> Wilcoxon signed rank test between baseline and 36-month follow-up to analyze within-group changes of outcome parameters

<sup>b</sup> Mann-Whitney U test were used to analyze between-group differences of change scores between STN-DBS and MED group.

**Supplementary Table e-3 – Spearman correlations between change scores of PDQ-8 SI and NMSS (total and domain scores) separately for STN-DBS and MED groups.**

Intervention		NMSS total score	Cardio-vascular	Sleep/fatigue	Mood/apathy	Perceptual problems/hallucinations	Attention/memory	Gastro-intestinal	Urinary	Sexual functions	Miscellaneous	
PDQ-8 SI	STN-DBS	rho	<b>.350*</b>	.069	.260	.284	.286	.050	-.035	<b>.345*</b>	.053	.245
		p	.031	.681	.116	.084	.082	.767	.833	.034	.751	.138
		n	38	38	38	38	38	38	38	38	38	38
	MED	rho	<b>.478**</b>	.145	<b>.551**</b>	.260	.071	<b>.327*</b>	.063	.221	.160	.267
		p	.002	.385	<.001	.115	.672	.045	.709	.183	.338	.105
		n	38	38	38	38	38	38	38	38	38	38

**Legend:** Correlation coefficients for significant results are highlighted in bold.

\* p < 0.050

\*\* p < 0.010

\*\*\* p < 0.001

**Abbreviations:** MED = standard-of-care medical treatment; NMSS = Non-motor Symptom Scale; PDQ-8 SI = Parkinson's Disease Questionnaire-8 Summary Index; STN-DBS = subthalamic nucleus deep brain stimulation.