

Supplementary Table S1. Preoperative Cognitive Results.

Cognitive Domain	VH		ICB		All	
	Mean	SD	Mean	SD	Mean	SD
Attention	51.44	6.84	49.76	7.64	50.78	6.63
Executive Function	47.37	8.64	47.35	10.29	47.96	8.78
Language	50.09	4.65	49.06	8.00	50.26	6.61
Memory	41.53	9.26	45.86	11.37	44.67	8.49
Visuospatial	43.95	10.02	47.63	7.00	47.45	9.05

Results are reported as mean psychometric T scores (mean = 50, standard deviation = 10). No statistically significant differences ($p < 0.05$) were found between VH yes/no condition or ICB yes/no condition by 2-sample t-test. Note that data for 'no' conditions for VH or ICB are not shown for clarity. VH = visual hallucinations, ICB = impulse control behaviors.

Supplementary Table S2. Preoperative Cognitive Results by Target

Cognitive Domain	STN		GPi		p-value
	Mean	SD	Mean	SD	
Attention	51.54	6.23	48.03	7.62	0.121
Executive Function	49.99	7.25	40.87	10.24	0.0001*
Language	51.13	5.84	47.21	8.38	0.070
Memory	46.20	7.65	38.95	9.39	0.011*
Visuospatial	49.43	7.98	40.06	9.31	0.0002*

Results are reported as mean psychometric T scores (mean = 50, standard deviation = 10).

*Indicates significant difference by 2-sample t-test. STN = subthalamic nucleus, GPi = globus pallidus internus, SD = standard deviation.

Supplementary Table S3. Postoperative Changes in Cognition Across Entire Cohort

Cognitive Domain	Preoperative		Postoperative		Diff	p-value
	Mean	SD	Mean	SD		
Attention	50.80	6.70	50.44	7.16	-0.36	0.685
Executive Function	48.11	8.79	44.47	9.77	-3.64	0.0001*
Language	50.25	6.67	48.20	7.29	-2.05	0.001*
Memory	44.67	8.49	44.60	9.36	-0.07	0.956
Visuospatial	47.45	9.05	48.12	9.27	+0.67	0.442

Results are reported in mean psychometric T scores (mean = 50, standard deviation = 10). p-values based on difference between pre- and post-DBS performance by paired t-test with a null hypothesis that there is no change ($\Delta T=0$). *Indicates significant difference by paired t-test. SD = standard deviation.

Supplementary Table S4. Linear Regression Models of Postoperative Cognitive Changes as a Function of History of VH Excluding Illusions

Cognitive Domain	b	SE	p-value
Attention	-2.75	1.96	0.167
Executive Function	-4.79	1.85	0.013*
Language	+0.60	1.35	0.659
Memory	-1.89	2.64	0.479
Visuospatial	+1.11	1.99	0.580

*Indicates statistically significant ($p < 0.05$) difference in linear regression model. b = linear regression coefficient, SE = standard error.

Supplementary Table S5. Linear Regression Models of Postoperative Cognitive Changes as a Function of History of VH (Both Including and Excluding Illusions) with Baseline Cognition as an Additional Covariate.

Cognitive Domain	VH (including illusions)			VH (excluding illusions)		
	b	SE	p-value	b	SE	p-value
Attention	-3.59	1.78	0.050	-2.29	1.80	0.210
Executive Function	-4.21	1.77	0.021*	-4.67	1.88	0.017*
Language	+0.21	1.25	0.868	+0.65	1.33	0.631
Memory	-4.49	2.40	0.068	-3.59	2.54	0.165
Visuospatial	-1.69	1.91	0.382	-0.01	1.91	0.995

*Indicates statistically significant ($p < 0.05$) difference in linear regression model. VH = visual hallucinations, b = linear regression coefficient, SE = standard error.

Supplementary Table S6. Linear Regression Models of Postoperative Changes in Select Cognitive Tests a Function of History of VH.

Test	b	SE	p-value
Trails Making Test-B	-4.27	4.57	0.355
Color-Word Interference Test	-5.27	3.37	0.125
WASI-II Matrix Reasoning	-5.48	3.11	0.085
WASI-II Similarities	+0.62	2.77	0.824
RBANS Digit Span Forward	-4.83	3.08	0.123
F-A-S	-1.67	2.10	0.430
WAIS Digit Span Backward	-4.95	2.80	0.084
WAIS Picture Completion	+0.40	3.07	0.897

Surgical target and duration between NPT are included in the model as covariates. b = linear regression coefficient, SE = standard error.