### Supplementary Table 1. Preoperative demographic and clinical features of people with Parkinson’s disease and subthalamic deep brain stimulation at baseline and follow-ups

| Variable                        | Baseline and 1-year follow-up | 10-year follow-up | 15-year follow-up |
|---------------------------------|-------------------------------|------------------|-------------------|
|                                 | Values n (%); mean ±SD; Median {range} | Values n (%); mean ±SD; Median {range} | Values n (%); mean ±SD; Median {range} |
| **Patients (N) and Sex**        |                               |                  |                   |
| 302 (183 Male, 60.6%; 119 Female, 39.4%) | 102 (63 Male, 61.8%; 39 Female, 38.2%) | 57 (36 Male, 63.2%; 21 Female 36.8%) |
| **Age at disease onset**        | 43.96 ±8.18; 44 (19.00-62.00) | 40.77 ±7.64; 41 (24.00-61.00) | 39.67 ±7.16; 40 (24.00-56.00) |
| **Age at surgery (y)**          | 55.61 ±8.42; 56.00 (29.00-74.00) | 53.36 ±8.47; 53.50 (31.00-70.00) | 50.79 ±8.33; 53.00 (31.00-69.00) |
| **Disease duration at surgery (y)** | 11.75 ±4.27; 12.00 (2.00-27.00) | 12.41 ±4.37; 12.00 (4.00-24.00) | 11.17 ±3.68; 11.00 (5.00-21.00) |
| **Clinical phenotype**          | 109 AR (36.1%); 40 T (13.2%); 151 Mixed (50.0%) | 37 AR (36.3%); 10 T (9.8%); 55 Mixed (53.9%) | 18 AR (31.6%); 6 T (10.5%); 33 Mixed (57.9%) |
| **WMH on brain MRI**            | No 195 (64.6%); Yes 37 (12.3%); Missing data 70 (23.2%) | No 59 (57.8%); Yes 8 (7.8%); Missing data 35 (34.3%) | No 45 (78.9%); Yes 7 (12.3%); Missing data 5 (8.8%) |
| **Baseline UPDRS-I**            | 1.94 ±1.57; 2.00 (0.00-8.00) | 1.98 ±1.53; 2.00 (0.00-7.00) | 2.03 ±1.41; 2.00 (0.00-5.00) |
| **Baseline UPDRS-II**           | OFF: 24.41 ±7.32; 24.00 (3.00-42.00) | OFF: 24.50 ±6.82; 25.00 (8.00-40.00) | OFF: 23.77 ±6.52; 24.00 (8.00-37.00) |
| **Baseline UPDRS-III**          | OFF: 45.26 ±15.41; 43.00 (13.00-91.95) | OFF: 47.08 ±15.91; 47.25 (15.50-91.50) | OFF: 43.42 ±12.83; 43.50 (15.50-71.00) |
| **Baseline Hoehn & Yahr**       | OFF: 3.35 ±0.99; 3.00 (1.50-5.00) | OFF: 3.42 ±0.91; 4.00 (2.00-5.00) | OFF: 3.25 ±0.87; 3.00 (2.00-5.00) |
| **Baseline axial score**        | OFF: 6.82 ±3.94; 6.00 (0.00-16.00) | OFF: 6.65 ±3.44; 6.00 (0.00-16.00) | OFF: 5.53 ±2.64; 5.00 (0.00-12.00) |
| **Baseline axial response to L-Dopa (%)** | OFF: 9.54 ±3.14; 9.00 (0.00-17.00) | 9.76 ±3.25; 10.00 (3.00-17.00) | 10.44 ±3.13; 11.00 (3.00-16.00) |
| **Baseline MDRS**               | 137.43 ±5.04; 139.00 (122.00-144.00) | 137.16 ±4.93; 139.00 (124.00-144.00) | 137.41 ±5.08; 139.00 (125.00-144.00) |
| **Baseline frontal score**      | 38.96 ±7.87; 40.00 (17.60-50.00) | 39.99 ±6.82; 40.05 (26.00-50.00) | 40.82 ±6.87; 42.00 (26.00-50.00) |
| **Baseline BDI-II**             | 11.58 ±7.36; 10.00 (0.00-42.00) | 11.67 ±7.31; 10.00 (0.00-37.00) | 12.17 ±7.08; 11.00 (0.00-37.00) |
| **Baseline LEDDs**              | 1347.67 ±505.86; 1340.00 (265.00-3200.00) | 1375.64 ±427.13; 1364.00 (554.00-2479.00) | 1341.24 ±436.92; 1250.00 (555.00-2347.00) |

AR: akinetic-rigid; BDI: Beck depression inventory; LEDDs: L-Dopa equivalent daily doses; MDRS: Mattis dementia rating scale; MRI: magnetic resonance imaging; OFF: not under dopaminergic therapy; ON: under dopaminergic therapy; T: tremorigen; UPDRS: unified Parkinson’s disease rating scale; WMH: white matter hyperintensities. 1All subjects at baseline were also included at the 1-year follow-up.
# Supplementary Data 1. STROBE Statement - checklist of items for reports of cohort studies

| Item No | Recommendation | Page No |
|---------|----------------|---------|
| **Title and abstract** | 1 (a) Indicate the study’s design with a commonly used term in the title or the abstract  
(b) Provide in the abstract an informative and balanced summary of what was done and what was found | 3 (a,b) |
| **Introduction** | 2 Explain the scientific background and rationale for the investigation being reported | 4-5 |
| **Objectives** | 3 State specific objectives, including any prespecified hypotheses | 5 |
| **Methods** | 4 Present key elements of study design early in the paper | 5 |
| Study design | 5 Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | 14 |
| Setting | 6 (a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up  
(b) For matched studies, give matching criteria and number of exposed and unexposed | 14-15 (a) |
| Participants | 7 Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | 14-16 |
| Variables | 8* For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | 14-17 |
| Data sources/measurement | 9 Describe any efforts to address potential sources of bias | 14-17 |
| Bias | 10 Explain how the study size was arrived at | 5, 14 |
| Study size | 11 Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | 14-17 |
| Quantitative variables | 12 (a) Describe all statistical methods, including those used to control for confounding  
(b) Describe any methods used to examine subgroups and interactions  
(c) Explain how missing data were addressed  
(d) If applicable, explain how loss to follow-up was addressed  
(e) Describe any sensitivity analyses | 14-17 (a,b,c) |
| Statistical methods | 13* (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed  
(b) Give reasons for non-participation at each stage  
(c) Consider use of a flow diagram | 5-6 (a,b) |
| Participants | 14* (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders  
(b) Indicate number of participants with missing data for each variable of interest  
(c) Summarise follow-up time (eg, average and total amount) | 5-7 (a,b,c) |
| Descriptive data | 15* Report numbers of outcome events or summary measures over time | 5-7 |
| Outcome data | | |
| Component       | Section | Instructions                                                                                   | Notes       |
|-----------------|---------|-----------------------------------------------------------------------------------------------|-------------|
| Main results    | 16      | *(a)* Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their    | (5-7)       |
|                 |         | precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and     | (a,b,c)     |
|                 |         | why they were included                                                                        |             |
|                 |         | *(b)* Report category boundaries when continuous variables were categorized                    |             |
|                 |         | *(c)* If relevant, consider translating estimates of relative risk into absolute risk for a     |             |
|                 |         | meaningful time period                                                                        |             |
| Other analyses  | 17      | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses  | 7           |
| Discussion      | 18      | **Key results**: Summarise key results with reference to study objectives                       | 7-8         |
|                 |         | **Limitations**: Discuss limitations of the study, taking into account sources of potential     | 12-13       |
|                 |         | bias or imprecision. Discuss both direction and magnitude of any potential bias                 |             |
|                 |         | **Interpretation**: Give a cautious overall interpretation of results considering objectives,  | 7-14        |
|                 |         | limitations, multiplicity of analyses, results from similar studies, and other relevant evidence|             |
|                 |         | **Generalisability**: Discuss the generalisability (external validity) of the study results     | 7-14        |
| Other information| 22      | **Funding**: Give the source of funding and the role of the funders for the present study and, if| 18          |
|                 |         | applicable, for the original study on which the present article is based                       |             |