**Supplementary file 2.**

Author judgment for ROB assessment of RCTs

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| Author, Year | Domain | Author Judgment |
| ROTHLIND et al 2007[1] | Random sequence generation (selection bias) | Unclear- No mention of the method |
| Allocation concealment (selection bias) | Unclear- No mention of the method |
| Blinding of participants and personnel (performance bias) | High - Open-label study |
| Blinding of outcome assessment (detection bias) | High - Open-label study |
| Incomplete outcome data (attrition bias) | Low - 100 % of randomly assigned patients entered the final analysis. |
| Selective reporting (reporting bias) | Low |
| Other bias | Low |

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| Author, Year | Domain | Author Judgment |
| ROTHLIND et al 2014[2] | Random sequence generation (selection bias) | Unclear- “Randomization to deep brain stimulation or best medical therapy included stratification by study site and patient age (<70 years vs ≥70 years)” |
| Allocation concealment (selection bias) | Unclear- No mention of the method |
| Blinding of participants and personnel (performance bias) | Low – “Patients underwent surgery within 1 month after randomization and remained unaware of the surgical target for the duration of the study” |
| Blinding of outcome assessment (detection bias) | High – Neuropsychologists weren’t blinded to surgical target |
| Incomplete outcome data (attrition bias) | Low - 100 % of randomly assigned patients entered the final analysis. |
| Selective reporting (reporting bias) | Low |
| Other bias | Low |

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| Author, Year | Domain | Author Judgment |
| Odekerken e al 2015[3] | Random sequence generation (selection bias) | Low- “Based on a computer-generated sequence, patients were randomly assigned to receive either GPi DBS or STN DBS in one-to-one ratio,” |
| Allocation concealment (selection bias) | Low- “Based on a computer-generated sequence, patients were randomly assigned to receive either GPi DBS or STN DBS in one-to-one ratio,” |
| Blinding of participants and personnel (performance bias) | Low – “Patients as well as clinical, neuropsychological, and psychiatric assessors were blinded for treatment allocation.” |
| Blinding of outcome assessment (detection bias) | Low – “Patients as well as clinical, neuropsychological, and psychiatric assessors were blinded for treatment allocation.” |
| Incomplete outcome data (attrition bias) | Low - 89 % of randomly assigned patients entered the final analysis. |
| Selective reporting (reporting bias) | Low |
| Other bias | Low |

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| Author, Year | Domain | Author Judgment |
| Okun et al. 2009[4] | Random sequence generation (selection bias) | Unclear- No mention for the method |
| Allocation concealment (selection bias) | Unclear- No mention |
| Blinding of participants and personnel (performance bias) | Low- Double-blinded Masking was stated in the protocol but no mention in the paper, https://clinicaltrials.gov/ct2/show/NCT00360009. |
| Blinding of outcome assessment (detection bias) | Low - Double-blinded Masking was stated in the protocol but no mention in the paper, https://clinicaltrials.gov/ct2/show/NCT00360009 |
| Incomplete outcome data (attrition bias) | Low - 88 % of randomly assigned patients entered the final analysis. |
| Selective reporting (reporting bias) | Low |
| Other bias | Low |

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[2] Rothlind JC, York MK, Carlson K, Luo P, Marks WJJ, Weaver FM, et al. Neuropsychological changes following deep brain stimulation surgery for Parkinson’s disease: comparisons of treatment at pallidal and subthalamic targets versus best medical therapy. J Neurol Neurosurg Psychiatry 2015;86:622–9. doi:10.1136/jnnp-2014-308119.

[3] Odekerken VJJ, Boel JA, Geurtsen GJ, Schmand BA, Dekker IP, de Haan RJ, et al. Neuropsychological outcome after deep brain stimulation for Parkinson disease. Neurology 2015;84:1355–61. doi:10.1212/WNL.0000000000001419.

[4] Okun MS, Fernandez HH, Wu SS, Kirsch-Darrow L, Bowers D, Bova F, et al. Cognition and mood in Parkinson’s disease in subthalamic nucleus versus globus pallidus interna deep brain stimulation: the COMPARE trial. Ann Neurol 2009;65:586–95. doi:10.1002/ana.21596.