Supplementary Table 1. Demographic and clinical details of the participants in the real treatment group. M=male; F=female; L=left; R=right; MOCA=Montreal Cognitive Assessment; MDS-UPDRS-III = Motor Disease Society Unified Parkinson’s Disease Rating Scale, Part III; H & Y = Hoehn and Yahr Rating Scale; TUG = Timed up and Go; CN = Cranial Nerve; * = patient with comorbid diagnosis of Progressive Supranuclear Palsy, 

| Participant | Sex | Age (years) | Handedness | Time since diagnosis (years) | Weight (Lbs) | Height (inches) | MOCA (/30) | MDS-UPDRS-III | H & Y | TUG (s) | Medication [drug name (mg/day)] | Neurological examination |
|-------------|-----|-------------|------------|----------------------------|--------------|----------------|------------|---------------|-------|--------|--------------------------------|------------------------|
| VA002       | F   | 60          | R          | 0.37                       | 113          | 62             | 29         | 1             | 1     | 0      | rasagiline (1)                      | Normal; CN1 not tested. |
| VA004       | M   | 76          | R          | 14.97                      | 171          | 70             | 22         | 1             | 1     | 1      | trihexyphenidyl (8), carbidopa (18.8), levodopa (75), pramipexole (3), selegiline (10) | Mild right shoulder weakness (1), hypoactive muscle stretch reflexes bilaterally |
| VA010       | F   | 79          | R          | 2.17                       | 96           | 62             | 20         | 1             | 0     | 2      | carbidopa (125), levodopa (500), pramipexole (0.25) | Mild sensory loss for pin prick sensation in bilateral lower limbs |
| VA012       | M   | 73          | R          | 4.31                       | 345          | 75             | 17         | 1             | 0     | 1      | carbidopa (150), levodopa (600), pramipexole (3), entacapone (600) | Hyperactive muscle stretch reflexes in arms bilaterally |
| VA013       | M   | 68          | R          | 10.32                      | 160          | 65             | 28         | 2             | 2     | 1      | entacapone (600), amantadine (200), carbidopa (75), levodopa (300) | Normal |
| VA015       | M   | 62          | R          | 18.96                      | 221          | 68             | 27         | 1             | 0     | 1      | carbidopa (175), levodopa (1450), ropinirole (5), selegiline (10), entacapone (1000) | CN1 abnormal (could not detect coffee ground) |
| VA017       | F   | 67          | R          | 1.26                       | 144          | 65             | 24         | 1             | 0     | 1      | carbidopa (100), levodopa (400), clonazepam (.5?) | No notes available |
| VA020       | M   | 78          | R          | 4.67                       | 216          | 71             | 26         | 2             | 1     | 1      | carbidopa (50), levodopa (200), rasagiline (1) | Impaired sense of smell |
| VA021       | M   | 84          | R          | 3.13                       | 200          | 67             | 20         | 1             | 0     | 1      | carbidopa (25), levodopa (100) | UPSIT 11/40; mild apraxia palsy; hypoactive R & |
|       |       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| VA022 | F     | 63    | R     | 8.36  | 119   | 63    | -     | 2     | 0     | 2     | 30    | 2     | 14.0  |
|       |       |       |       |       |       |       |       |       |       |       | carbidopa (50), levodopa (200) 1 qhs and 1/2 qam; carbidopa (25); levodopa (80) |
|       |       |       |       |       |       |       |       |       |       |       | Poor sense of smell, mild reduction in vibration sense in R & L legs |
| VA024 | M     | 58    | R     | 10.88 | 134   | 66    | 29    | 1     | 0     | 3     | 26    | 3     | 8.0   |
|       |       |       |       |       |       |       |       |       |       |       | carbidopa levodopa (10-100 qid, 5-200 CR qid); |
|       |       |       |       |       |       |       |       |       |       |       | Normal |
| VA025 | F     | 73    | R     | 9.38  | 155   | 59    | 25    | 2     | 1     | 3     | 37    | 3     | 11.3  |
|       |       |       |       |       |       |       |       |       |       |       | carbidopa levodopa (100-400), ER (2) at bedtime |
|       |       |       |       |       |       |       |       |       |       |       | CN I abnormal |
| VA028 | M     | 78    | R     | 18.07 | 178.5 | 62    | 25    | 1     | 0     | 1     | 35    | 2     | 8.0   |
|       |       |       |       |       |       |       |       |       |       |       | carbidopa/levodopa (25/100 x 2, 5x/day), azilect (); entacapone (1000), carbidopa/levodopa (50-200 qhs) |
|       |       |       |       |       |       |       |       |       |       |       | CN I abnormal, decreased vibration sense in R and L leg, hypoactive reflexes R and L arm, R and L leg |
| VA029 | M     | 69    | R     | 3.21  | 155   | 71    | 25    | 2     | 1     | 1     | 55    | 3     | 11.4  |
|       |       |       |       |       |       |       |       |       |       |       | rasagine (0.5), exelon (3), miralax (1700), Vit D (4), Glucosamine/chondroitin (1tab), Vit C (500), |
|       |       |       |       |       |       |       |       |       |       |       | Normal, CN 1 not tested |
| VA030 | M     | 65    | R     | 4.96  | 140   | 67    | 29    | 1     | 0     | 1     | 33    | 3     | 10.8  |
|       |       |       |       |       |       |       |       |       |       |       | sinemet (25/100, 3x/day), bupropion (150), dulare (10), Vit D (5,000) |
|       |       |       |       |       |       |       |       |       |       |       | Mild ophthalmoparesis in all directions of gaze, could not bury the sclera on horizontal gaze |
| VA031 | M     | 80    | R     | 4.33  | 188   | 72    | 24    | 1     | 0     | 0     | 25    | 2.5   | 9.2   |
|       |       |       |       |       |       |       |       |       |       |       | amantadine (100); carbidopa (25); levodopa (100) |
|       |       |       |       |       |       |       |       |       |       |       | Cannot smell coffee, slight cerebellar tumor (tremor?), decreased vibration in ankles (R and L) |

Mean (SD) | 70.8 (7.9) | 7.5 (5.8) | 171.0 (58.5) | 66.6 (4.4) | 24.7 (0.5) | 1.4 (0.5) | 0.4 (0.6) | 1.3 (0.9) | 34.3 (9.9) | 2.4 (0.6) | 11.6 (5.0) |
**Supplementary Table 2.** Demographic and clinical details of the participants in the sham treatment group. M=Male; F=female; L=left; R=right; MOCA=Montreal Cognitive Assessment; MDS-UPDRS-III = Motor Disease Society Unified Parkinson’s Disease Rating Scale, Part III; H & Y = Hoehn and Yahr Rating Scale; TUG = Timed up and Go; CN = Cranial Nerve; - = data not available / not tested.

| Ppt  | Sex | Age (years) | H’ness | Time since diagnosis (years) | Weight (Lbs) | Height (inches) | MOCA (/30) | Gait (/4) | Freezing (/4) | Postural Stability (/4) | Total (132) | H & Y | TUG (s) | Medication [drug name (mg/day)] | Neurological examination |
|------|-----|-------------|--------|-----------------------------|--------------|----------------|------------|----------|--------------|--------------------------|-------------|-------|--------|--------------------------------|------------------------|
| VA001 | F   | 65          | R      | 6.25                        | 150          | 63             | 24         | 0        | 0            | 0                        | 36          | 2     | 8.4    | carbidopa (150), levodopa (600), ropinirole (12); rasagiline (1) | Normal |
| VA005 | F   | 60          | R      | 6.13                        | 186          | 65             | 27         | 1        | 0            | 1                        | 23          | 2.5   | 8.2    | pramipexole (2.25), carbidopa (75), levodopa (300) | Normal |
| VA006 | M   | 78          | R      | 12.81                       | 197          | 67             | 19         | 2        | 1            | 3                        | 59          | 3     | 15.4   | carbidopa (200), levodopa (800) | Normal |
| VA007 | F   | 63          | R      | 21.78                       | 120          | 63             | 26         | 1        | 0            | 3                        | 45          | 3     | 11.6   | carbidopa (19); levodopa(75); rasagiline (0.5); trihexiphenydil (4) | Decreased sensation to pain and vibration in left arm, Muscle stretch reflect absent in right bicep |
| VA008 | F   | 70          | R      | 6.16                        | 116          | 58             | 28         | 1        | 0            | 1                        | 41          | 2.5   | 9.0    | carbidopa (125), levodopa (500), rotigotine (8), rasagiline (1) | Action tremor in hands bilaterally |
| VA011 | M   | 72          | L      | 2.5                         | 179          | 74             | 28         | 1        | 0            | 1                        | 53          | 3     | 9.2    | carbidopa (850), levodopa (1150) | CN II IV VI abnormal (mild lateral gaze paresis), CN VIII abnormal (decreased hearing to finger rubs on L), decreased vibration sense on R LE |
| VA014 | M   | 68          | R      | 9.08                        | 127          | 65             | 27         | 1        | 1            | 1                        | 28          | 3     | 7.4    | Carbidopa (??); levodopa (??); ropinerole (2); clonazepam (0.5); | CN VII abnormal (R lower face does not elevate) |
|   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|
| VA016 | M | 72 | L | 7.44 | 213 | 72 | 30 | 1 | 0 | 1 | 19 | 2 | 6.9 |
|   |   |   |   | gabapentin (300) | carbidopa (200); levodopa (800); ropinirole (6); selegiline (10) | CN 1 abnormal (microsmia diagnosed 2011) |
| VA018 | F | 67 | R | 6.19 | 138 | 68 | 26 | 1 | 0 | 0 | 19 | 2 | 9.0 |
|   |   |   |   | carbidopa (100); levodopa (400); trihexyphenydyil (3) | Normal |
| VA023 | F | 74 | R | 3.68 | 124 | 62 | 29 | 2 | 0 | 1 | 41 | 3 | 11.9 |
|   |   |   |   | carbidopa (100); levodopa (400); selegiline (10); pramipexole (1.125) | Poor sense of smell (CNI); mild reduced vibration sense lower limbs bilaterally, hypoactive muscle stretch reflexes upper and lower limbs bilaterally |
| VA026 | M | 52 | R | 0.79 | 230 | 75 | 24 | 1 | 0 | 0 | 34 | 2 | 9.1 |
|   |   |   |   | pramipexole (0.75); rasagiline (1) | mild terminal tremor (intention), heel-to-shin R leg abnormal |
| VA027 | F | 63 | L | 10.54 | 131 | 63 | 30 | 0 | 0 | 0 | 6 | 2 | 6.4 |
|   |   |   |   | Carbidopa (250); levodopa (1000); melatonin (5); aspirin (81); fish oil (1); estradiol (0.025); rasagiline (1), rotigotine (6), entacapone (600) | No notes available |
| VA032 | M | 84 | R | 7.36 | 168 | 70 | 26 | 2 | 1 | 1 | 31 | 3 | 15.7 |
|   |   |   |   | Carbidopa (25); levodopa (100) | CN I abnormal, decreased temp/vibration sensitivity in legs (R and L) |
| Mean (SD) | 68.3 (8.2) | 7.7 (5.3) | 159.9 (38.2) | 66.5 (5.1) | 26.5 (3.0) | 1.1 (0.6) | 0.2 (0.4) | 1.0 (1.0) | 33.5 (14.7) | 2.5 (0.5) | 9.9 (3.0) |