

## Supplementary Material 1

### Inclusion and exclusion criteria

Subjects who fulfilled the following criteria were included: 1) 45–75 years of age, 2) diagnosis of Parkinson's disease (PD) based on the UK Brain Bank criteria,<sup>8</sup> and 3) Hoehn and Yahr stage<sup>9</sup> 1–3. Patients with any of the following conditions were excluded: 1) severe cognitive impairment (Mini-Mental State Examination [MMSE]<sup>10</sup> score < 20), 2) visual or hearing impairment, 3) psychosis, 4) conditions affecting physical performance other than PD such as musculoskeletal problem, severe lumbar stenosis, or severe cardiopulmonary disease, 5) severe white matter hyperintensities (WMHs), which were defined as deep WMHs  $\geq 25$  mm and periventricular WMHs  $\geq 10$  mm on fluid attenuated inversion recovery image, and 6) territorial infarction or lobar hemorrhage.