Appendix: Description and reliability of impairment and balance and mobility measures

Test	Description	Reliability
Impairment measures		
MDS-UPDRS motor examination[1] (0-132)	Observer rating scale of PD motor impairments (e.g. rigidity, tremor, bradykinesia) across multiple body parts and a small number of mobility items (e.g. gait, arising from a chair). All items can be rated as 0 (normal), 1 (slight), 2(mild), 3 (moderate) or 4 (severe).	PD: Internal consistency[1]: Cronbach's alpha 0.93
New freezing of gait questionnaire[2] (0-29)	Self-report questionnaire for people with PD. 9 questions to determine the presence, severity and impact of freezing during walking, turning and gait initiation.	PD: Reliability[2]: pre- and post- viewing a video showing examples of freezing ICC=0.78
Reactive stepping[1,3] (0-8)	Sum of the push and release test[3] and the postural stability item of the MDS-UPDRS motor examination.[1] The push and release test requires standing participants to lean backwards into the examiners hands until the participant's centre of mass is outside the base of support. The examiner then removes their hands and the participant is rated on their ability to recover balance (0-4). In the postural stability test of the MDS-UPDRS motor examination, participants are rated on their ability to respond to displacement (applied by the examiner) of the participants' centre of mass backwards (0-4).	PD: Push and release test – inter-rater reliability[3] ICC=0.83 PD: Pull test – inter-rater reliability[4] ICC=0.71
Sway on foam, eyes closed[5,6] (mm)	Participants stand barefoot and as still as possible on a 7mm medium-density foam rubber mat with their eyes closed for 30s. A swaymeter attached at waist level measures postural sway path length in millimetres.	PD: Test-retest reliability[6] – ICC=0.51

Frontal assessment battery[7] (0-18)	A short cognitive and behavioural battery to assess frontal lobe function. Subtests measure conceptualization, mental flexibility, motor programming, sensitivity to interference, inhibitory control and environmental autonomy.	General population including people with PD: Internal consistency: Cronbach's alpha 0.78 Inter-rater reliability[7] K=0.87
Balance and mobility measures – tasks <u>not</u> requiring a change in base of support		
Functional reach[8] (cm)	Participants reach as far forward as possible without overbalancing and the distance is measured in centimetres.	PD: test-retest reliability[9] ICC=0.84
Lateral reach[10] (cm)	Participants reach as far as they can to each side without overbalancing. Distance reached is measured in centimetres and mean distance reported.	PD: Test-retest reliability[6] ICC=0.62-0.81
Single leg stand[11] (s)	Participants stand on one leg as long as possible without losing balance (up to 30 s). Both sides are tested and mean time reported.	PD: Test-retest reliability[11] ICC=0.50-0.94
Co-ordinated stability[12]	Measures the ability to adjust balance in a steady and co-ordinated way. A sway-meter is attached to the participant's waist with a pen attached to the rod anteriorly. Participants must follow a convoluted track with the pen, taking them to the limits of their stability. An error score is calculated from deviations from the track.	PD: Test-retest reliability[6] ICC=0.50
Balance and mobility measures – tasks requiring a change in base of support		
Timed Up and Go[13] (s)	Time taken to stand from a chair, walk 3m at self-selected speed, turn and walk back to sit in the chair.	PD: Test-retest reliability[6] ICC=0.97

Timed Up and Go (cognitive)[14] (s)	Time taken to stand from a chair, walk 3m at self-selected speed, turn and walk back to sit in the chair while counting aloud backwards by 3's from a randomly selected number.	PD: Inter-rater reliability[6] ICC=0.55
10 metre walk speed (m/s)	Time taken to walk the middle 10m of a 14m track is recorded and converted to m/s. The test is performed at both "comfortable" and "fast" speeds.	PD: Test-retest reliability[9] ICC = 0.87
5-repetition STS[15] (stands/s)	Time taken to stand 5 times from a 45 cm chair with the arms folded across the chest is recorded and converted to stands/s.	PD: Test-retest reliability[6] ICC=0.91
Choice stepping reaction time[16] (steps/s)	Participants step in a random order to one of four panels positioned in front and to each side. The time to complete 12 steps is recorded and converted to steps/s.	PD: Test-retest reliability[6] ICC=0.74

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