Supplement A. Evaluation of longitudinal change in clinical, metabolic, inflammatory, vascular and motor data over 2-year period in all patients with 2-yr follow-up data (n=47)

	At baseline	After 2 years	p[¥]
IMT right	0.7 ± 0.3, 0.7 (0.3-1.6)	1.0 ± 0.3, 1.0 (0.5-1.8)	<0.001**
IMT left	0.8 ± 0.3, 0.7 (0.3-1.8)	1.0 ± 0.4, 1.0 (0.5-3.3)	<0.001**
PI right[¤]	1.0 ± 0.9, 0.8 (0.2-5.0)	1.6 ± 1.1, 1.2 (0.2-5.1)	<0.001**
PI left[¤]	0.9 ± 0.4, 0.8 (0.2-2.1)	1.5 ± 0.7, 1.2 (0.2-3.2)	<0.001**
RI right[¤]	0.6 ± 0.4, 0.5 (0.1-2.4)	0.9 ± 0.6, 0.7 (0.2-2.5)	<0.001**
RI left[¤]	0.6 ± 0.3, 0.6 (0.1-1.3)	0.9 ± 0.4, 0.7 (0.2-2.0)	<0.001**
QRISK2	14.3 ± 9.5, 13.1 (1.5-42.5)	15.7 ± 10.5, 12.8 (1.7-41.6)	0.005**
Uric acid (µmol/l)	260.1 ± 69.0, 256.0 (122.0-430.0)	248.3 ± 76.0, 241.0 (103.0-446.0)	0.108
Homocystein (µmol/l)	12.5 ± 2.9, 11.9 (7.9-20.7)	13.5 ± 5.3, 11.7 (8.3-34.9)	0.623
B12 (pg/ml)	312.2 ± 122.8, 295.0 (121.0-694.0)	279.4 ± 96.8, 266.0 (114.0-578.0)	0.017**
Folic acid (ng/ml)	7.5 ± 3.4, 6.6 (3.6-15.6)	6.8 ± 3.1, 6.2 (2.7-18.6)	0.062
C3 (g/l)	1.2 ± 0.3, 1.1 (0.8-2.9)	1.1 ± 0.2, 1.2 (0.6-1.8)	0.346
C4 (g/l)	0.3 ± 0.1, 0.2 (0.1-0.6)	0.3 ± 0.1, 0.2 (0.1-1.2)	0.225
Interleukin 6 (pg/ml)	3.7 ± 2.8, 3.1 (0.2-16.8)	3.7 ± 3.6, 2.9 (1.5-21.1)	0.067
UPDRS total	32.8 ± 15.5, 30.0 (7.0-76.0)	42.9 ± 18.2, 46.0 (12.0-80.0)	<0.001**
UPDRS I	1.5 ± 1.7, 1.0 (0.0-8.0)	2.5 ± 2.2, 2.0 (0.0-8.0)	0.007**
UPDRS II	8.7 ± 5.6, 8.0 (0.0-21.0)	11.6 ± 6.6, 13.0 (1.0-25.0)	0.002**
UPDRS III	22.8 ± 10.7, 21.0 (3.0-56.0)	28.7 ± 11.6, 29.0 (9.0-52.0)	<0.001**
ADL	6.8 ± 1.9, 8.0 (1.0-8.0)	6.3 ± 2.5, 8.0 (1.0-8.0)	0.036*
Barthel index	96.2 ± 8.6, 100.0 (60.0-100.0)	91.1 ± 12.5, 95.0 (60.0-100.0)	<0.001**

* Statistically significant result p<0.05 (which did not remain significant after FDR correction)
** Statistically significant result p<0.05 (which remained significant even after correction for multivariate comparisons)
[¤] Values not known in all patients (specifically, PI right, PI left, RI right and RI left was evaluated for 34, 36, 35 and 35 patients, respectively)
[¥] p-values calculated using paired Wilcoxon test

Legend: ADL (activity of daily living score), CN (cognitive normal), IMT (intimomedial thickness), PI (pulsatility index), RI (resistance index), UPDRS (Unified Parkinson's disease rating scale)

Supplement B. Evaluation of longitudinal change in clinical, metabolic, inflammatory, vascular and motor data over 2-year period in CN patients with 2-yr follow-up data (n=34)

	At baseline	After 2 years	p[¥]
IMT right	0.7 ± 0.3, 0.6 (0.4-1.6)	1.0 ± 0.3, 0.9 (0.5-1.8)	<0.001**
IMT left	0.7 ± 0.3, 0.7 (0.4-1.8)	1.0 ± 0.5, 0.9 (0.5-3.3)	<0.001**
PI right[¤]	1.0 ± 1.0, 0.8 (0.2-5.0)	1.6 ± 1.2, 1.3 (0.2-5.1)	<0.001**
PI left[¤]	1.0 ± 0.5, 0.8 (0.2-2.1)	1.4 ± 0.7, 1.2 (0.2-3.2)	<0.001**
RI right[¤]	0.6 ± 0.4, 0.5 (0.1-2.4)	1.0 ± 0.6, 0.8 (0.2-2.5)	<0.001**
RI left[¤]	0.6 ± 0.3, 0.6 (0.1-1.3)	0.9 ± 0.4, 0.7 (0.2-2.0)	<0.001**
QRISK2	13.6 ± 9.5, 11.2 (1.5-40.9)	14.7 ± 10.2, 12.4 (1.7-40.8)	0.014**
Uric acid (μmol/l)	262.3 ± 69.7, 261.0 (122.0-420.0)	252.4 ± 66.0, 246.5 (119.0-381.0)	0.270
Homocystein (μmol/l)	12.2 ± 2.7, 11.6 (8.4-20.7)	12.8 ± 4.7, 11.5 (8.3-34.9)	0.791
B12 (pg/ml)	319.6 ± 133.2, 300.0 (121.0-694.0)	283.9 ± 100.3, 282.5 (114.0-578.0)	0.038*
Folic acid (ng/ml)	7.2 ± 2.7, 6.7 (3.8-14.1)	7.3 ± 3.3, 6.5 (3.2-18.6)	0.462
C3 (g/l)	1.1 ± 0.4, 1.1 (0.8-2.9)	1.1 ± 0.2, 1.1 (0.6-1.5)	0.351
C4 (g/l)	0.3 ± 0.1, 0.2 (0.2-0.6)	0.3 ± 0.2, 0.2 (0.1-1.2)	0.771
Interleukin 6 (pg/ml)	3.0 ± 1.5, 2.8 (0.2-7.4)	3.5 ± 3.9, 2.1 (1.5-21.1)	0.150
UPDRS total	32.3 ± 16.7, 27.5 (9.0-76.0)	39.8 ± 17.1, 39.5 (12.0-80.0)	0.014**
UPDRS I	1.3 ± 1.5, 1.0 (0.0-6.0)	2.3 ± 2.0, 2.0 (0.0-8.0)	0.013**
UPDRS II	8.4 ± 5.4, 8.0 (0.0-21.0)	10.7 ± 6.4, 10.5 (1.0-25.0)	0.044*
UPDRS III	22.6 ± 11.7, 21.0 (5.0-56.0)	26.7 ± 11.3, 24.5 (9.0-50.0)	0.031*
ADL	6.9 ± 2.1, 8.0 (1.0-8.0)	6.5 ± 2.4, 8.0 (1.0-8.0)	0.219
Barthel index	96.3 ± 9.3, 100.0 (60.0-100.0)	93.2 ± 11.1, 100.0 (60.0-100.0)	0.026*

* Statistically significant result p<0.05 (which did not remain significant after FDR correction)

** Statistically significant result p<0.05 (which remained significant even after correction for multivariate comparisons)

[¤] Values not known in all patients (specifically, PI right, PI left, RI right and RI left was evaluated for 26, 28, 27 and 27 patients, respectively)

[¥] p-values calculated using paired Wilcoxon test

Legend: ADL (activity of daily living score), CN (cognitive normal), IMT (intimomedial thickness), PI (pulsatility index), RI (resistance index), UPDRS (Unified Parkinson's disease rating scale)

Supplement C. Evaluation of longitudinal change in clinical, metabolic, inflammatory, vascular and motor data over 2-year period in MCI patients with 2-yr follow-up data (n=13)

	At baseline	After 2 years	p[¥]
IMT right	0.9 ± 0.3, 0.8 (0.3-1.6)	1.1 ± 0.3, 1.0 (0.6-1.6)	0.002**
IMT left	0.8 ± 0.3, 0.7 (0.3-1.4)	1.0 ± 0.3, 1.1 (0.7-1.5)	0.001**
PI right[¤]	0.8 ± 0.2, 0.8 (0.3-1.1)	1.5 ± 1.0, 1.1 (0.4-3.3)	0.012**
PI left[¤]	0.8 ± 0.2, 0.8 (0.4-1.1)	1.6 ± 0.9, 1.2 (0.8-3.2)	0.018**
RI right[¤]	0.5 ± 0.1, 0.5 (0.2-0.6)	0.7 ± 0.3, 0.6 (0.2-1.3)	0.012**
RI left[¤]	0.5 ± 0.2, 0.6 (0.3-0.7)	0.8 ± 0.2, 0.7 (0.6-1.4)	0.018**
QRISK2	16.1 ± 9.5, 15.4 (3.0-42.5)	18.3 ± 11.3, 14.6 (3.0-41.6)	0.135
Uric acid (μmol/l)	254.2 ± 69.6, 247.0 (147.0-430.0)	237.3 ± 100.0, 232.0 (103.0-446.0)	0.162
Homocystein (μmol/l)	13.4 ± 3.4, 13.1 (7.9-17.8)	15.2 ± 6.4, 13.6 (8.5-29.2)	0.600
B12 (pg/ml)	292.8 ± 92.2, 245.0 (190.0-527.0)	267.5 ± 89.8, 238.0 (165.0-449.0)	0.196
Folic acid (ng/ml)	8.1 ± 4.8, 5.4 (3.6-15.6)	5.6 ± 2.3, 5.2 (2.7-9.9)	0.021**
C3 (g/l)	1.2 ± 0.2, 1.2 (0.8-1.5)	1.2 ± 0.2, 1.2 (0.9-1.8)	0.789
C4 (g/l)	0.3 ± 0.1, 0.3 (0.1-0.4)	0.2 ± 0.1, 0.2 (0.1-0.4)	0.068
Interleukin 6 (pg/ml)	5.4 ± 4.2, 3.6 (1.5-16.8)	4.3 ± 2.9, 3.7 (1.5-12.1)	0.124
UPDRS total	34.2 ± 12.5, 32.0 (7.0-52.0)	51.1 ± 19.1, 55.0 (19.0-80.0)	0.001**
UPDRS I	2.0 ± 2.2, 1.0 (0.0-8.0)	3.1 ± 2.7, 3.0 (0.0-7.0)	0.235
UPDRS II	9.8 ± 6.2, 8.0 (2.0-18.0)	13.8 ± 7.0, 14.0 (1.0-25.0)	0.004**
UPDRS III	23.2 ± 7.9, 23.0 (3.0-35.0)	34.0 ± 11.1, 31.0 (18.0-52.0)	0.002**
ADL	6.8 ± 1.2, 7.0 (5.0-8.0)	5.7 ± 2.7, 8.0 (1.0-8.0)	0.067
Barthel index	95.8 ± 6.7, 100.0 (80.0-100.0)	85.4 ± 14.4, 85.0 (60.0-100.0)	0.007**

* Statistically significant result p<0.05 (which did not remain significant after FDR correction)

** Statistically significant result p<0.05 (which remained significant even after correction for multivariate comparisons)

[¤] Values not known in all patients (specifically, PI right, PI left, RI right and RI left was evaluated for 8 patients)

[¥] p-values calculated using paired Wilcoxon test

Legend: ADL (activity of daily living score), CN (cognitive normal), IMT (intimomedial thickness), PI (pulsatility index), RI (resistance index), UPDRS (Unified Parkinson's disease rating scale)

Supplement D. Example calculation of probability of converting to mild cognitive impairment from normal cognition in two years in patients with Parkinson's disease

Probability of cognitive status worsening during 2-year follow-up in patients with Parkinson's disease can be calculated using following formula:

$$\frac{1}{1 + e^{-(2.76\, +\, 0.15*QRISK\, -\, 0.012*URIC\_ACID\, -\, 0.381*ADL)}}$$

For example, for a patient with QRISK=34.2, URIC_ACID=259 and ADL=7 the probability will be:

$$\frac{1}{1 + e^{-(2.76\, +\, 0.15*34.2\, -\, 0.012*259\, -\, 0.381*7)}} = 0.891$$

It means that the patient has 89.1% probability of worsening of cognitive status and thus will be classified to the group of patients with high risk of cognitive status impairment during time.