

Title (Min 55, max 83 characters)	Konectom™ cognitive processing speed testing and the influence of reaction time
In addition, a short title of maximum 45 characters should be submitted.	Konectom™ cognitive processing speed in MS
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Title

Konectom™ cognitive processing speed testing and the influence of reaction time

Short Title

Konectom™ cognitive processing speed in MS

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Reaction time (RT) has been shown to predict cognitive performance in disease settings. Smartphone-based Konectom cognitive processing speed test (CPST) is designed to measure information-processing speed while accounting for visuomotor RT. It includes the traditional symbol-to-digit (S2D) substitution task followed by a digit-to-digit (D2D) matching test to capture the visuomotor component of the CPST. Assessing the S2D substitution time (ST) while subtracting the D2D RT may limit the influence of visuomotor impairment and provide a more representative evaluation of true cognitive processing speed compared to conventional counting of correct responses.

The DigiToms study (NCT04756700) included people with multiple sclerosis (PwMS) aged 18-64 years, with Expanded Disability Status Scale (EDSS) score ≤ 6.0 . Baseline in-clinic assessments included Konectom CPST, EDSS, and symbol digit modalities test (SDMT). Konectom CPST was to be self-administered remotely over 14 consecutive days to assess cognitive processing speed and reliability. Konectom CPST ST was derived by subtracting mean D2D RT from mean S2D RT for each test. Relationship between conventional in-clinic measures (SDMT, EDSS) and CPST was assessed using Spearman rank correlations.

42 PwMS completed testing at interim data cut (mean age=41.3, 80% female, median EDSS=2.0). Remote test-retest reliability [ICC] for CPST ST testing was good (0.73). There was a significant correlation between CPST ST and SDMT score ($\rho = -.70$, $p < 0.0001$). CPST ST showed moderate correlation with EDSS score ($\rho = .38$, $p = 0.01$). D2D RT correlated with SDMT and EDSS score ($\rho = -.69$, $p < 0.001$, $\rho = .44$, $p = 0.004$ respectively).

Cognitive processing speed can reliably be self-assessed remotely by PwMS using Konectom. Konectom CPST features correlated with SDMT. Konectom CPST can be adjusted for visuomotor function to measure cognitive processing speed solely related to the substitution task, and may supplement CPST score to aid in assessment of cognitive function in MS.

Reference

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