

QyPredict® Accurately Identifies Future Motor Decliners in Parkinson's Disease Over 24, and 48 Months from Baseline assessment

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QYNAPSE



BACKGROUND

- Reliable prediction of disease progression remains a major unmet need in Parkinson's disease (PD) clinical research and trial design.
- We evaluated the ability of QyPredict®, an AI-based modeling platform, to predict longitudinal motor decline in idiopathic PD patients over 24, and 48 months, using the Movement Disorder Society-Unified Parkinson's Disease Rating Scale (MDS-UPDRS) Part III.

METHODS

- QyPredict® models predicting motor decline over 24 months were trained on data from 510 individuals from PPMI with idiopathic PD (mean age: 62.6, standard deviation (SD): 9.2, 35.7% female, MDS-UPDRS Part III ON: 21.6, SD: 9.8, MDS-UPDRS Part III OFF: 22.3, SD: 10.0). QyPredict® models predicting motor decline over 48 months were trained on data from 213 individuals from PPMI with idiopathic PD (mean age: 61.4, standard deviation (SD): 9.5, 33.3% female, MDS-UPDRS Part III ON: 19.6, SD: 8.9, MDS-UPDRS Part III OFF: 20.3, SD: 9.3). Motor decline was defined as an increase on the MDS-UPDRS Part III ON >5.
- Baseline multimodal data included demographics, clinical measures, and MRI features extracted via QyScore® (an FDA-cleared and CE-marked neuroimaging platform).
- For 24- and 48-month models, an independent validation dataset of 54 or 47 idiopathic PD patients (respectively), previously unseen by any predictive model, was used to assess model performances.

RESULTS

- QyPredict® showed excellent predictive performance when identifying idiopathic PD patients that would clinically decline over 24 months, achieving the following performance metrics: Sensitivity: 95%, Negative Predictive Value: 94%, RoC AUC: 71%, Balanced Accuracy: 72%, Specificity: 49%.
- Similarly, for prediction of clinical decline over 48 months, QyPredict® again showed excellent predictive performance, achieving the following performance metrics: Sensitivity: 77%, Negative Predictive Value: 76%, RoC AUC: 66%, Balanced Accuracy: 71%, Specificity: 64%.
- Patients predicted to decline demonstrated significantly greater decline than patients predicted to remain stable over both 24 and 48 months ($p < .001$).

CONCLUSION

- QyPredict® accurately predicts long-term motor progression in PD, offering a scalable and regulatory-grade approach to stratify patients by future risk of decline. These findings support the integration of predictive modeling into clinical trial enrichment strategies and support treatment decision-making, enabling more efficient identification of high-risk individuals and improved powering of disease-modifying PD therapy trials.

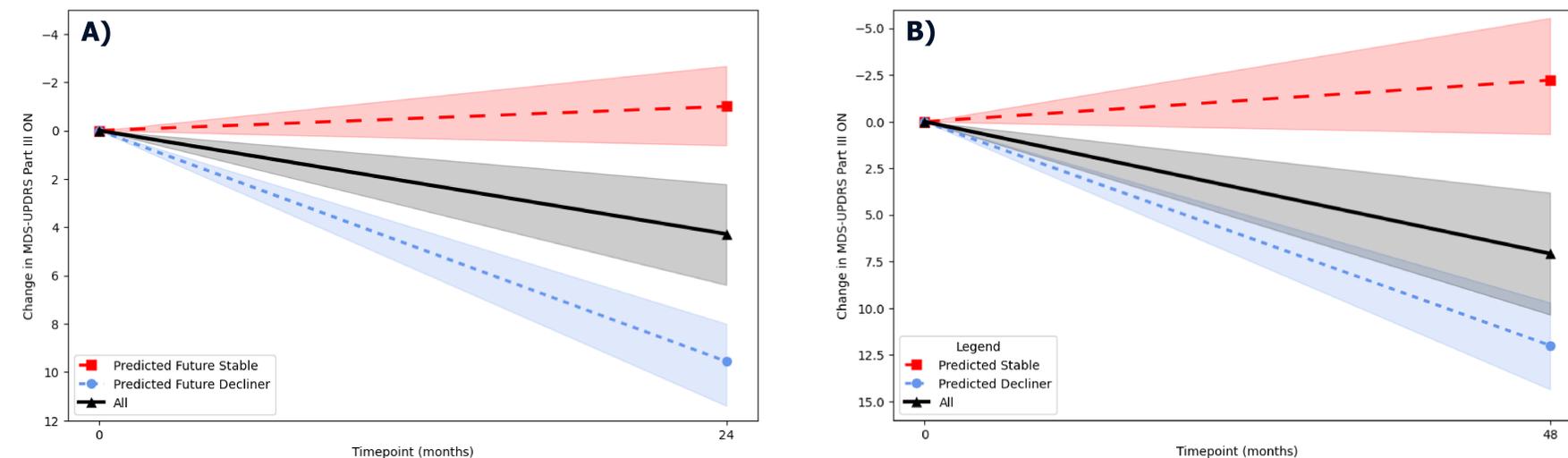


Figure 1. Shows the MDS-UPDRS Part III ON change of QyPredict® Predicted Decliners and Predicted Stables over A) 24 months, and B) 48 months.

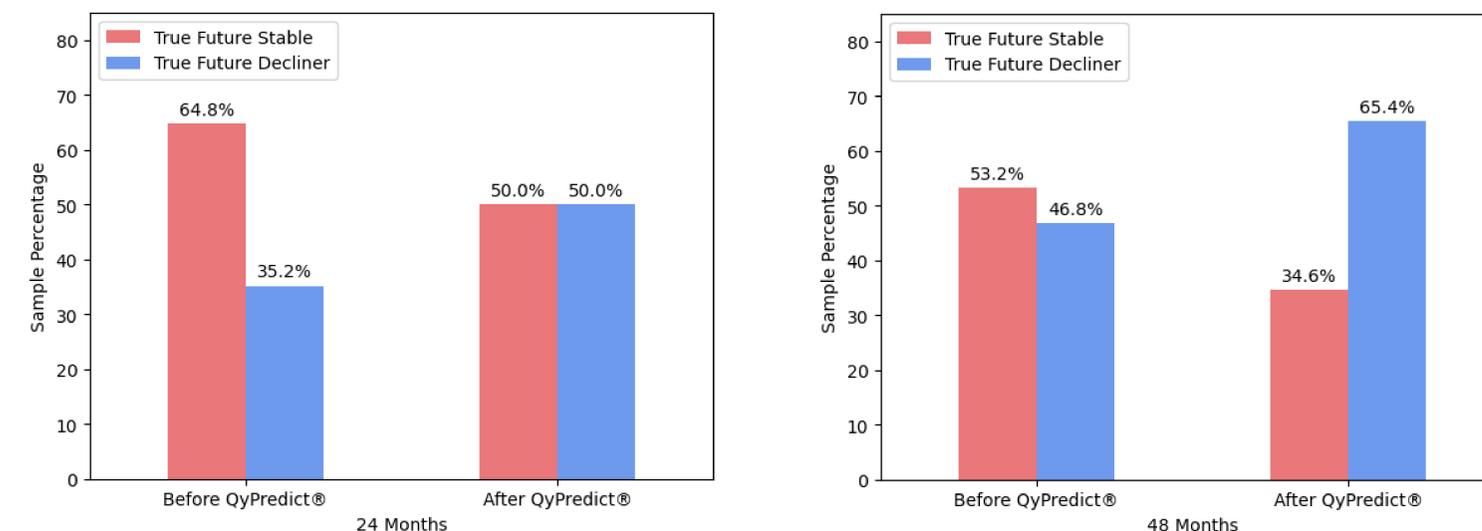


Figure 2. Shows the proportions of True Future Decliners and True Future Stables before and after the application of QyPredict®.

Table 1. Shows mean MDS-UPDRS Part III ON change before and after applying QyPredict® to the independent validation datasets.

Timepoint	Change in MDS-UPDRS Part III ON	
	Before QyPredict®	After QyPredict®
24 months	1.7	4.3
48 months	3.5	7.1