

The cloudUPDRS smartphone app: home monitoring for Parkinson's Disease

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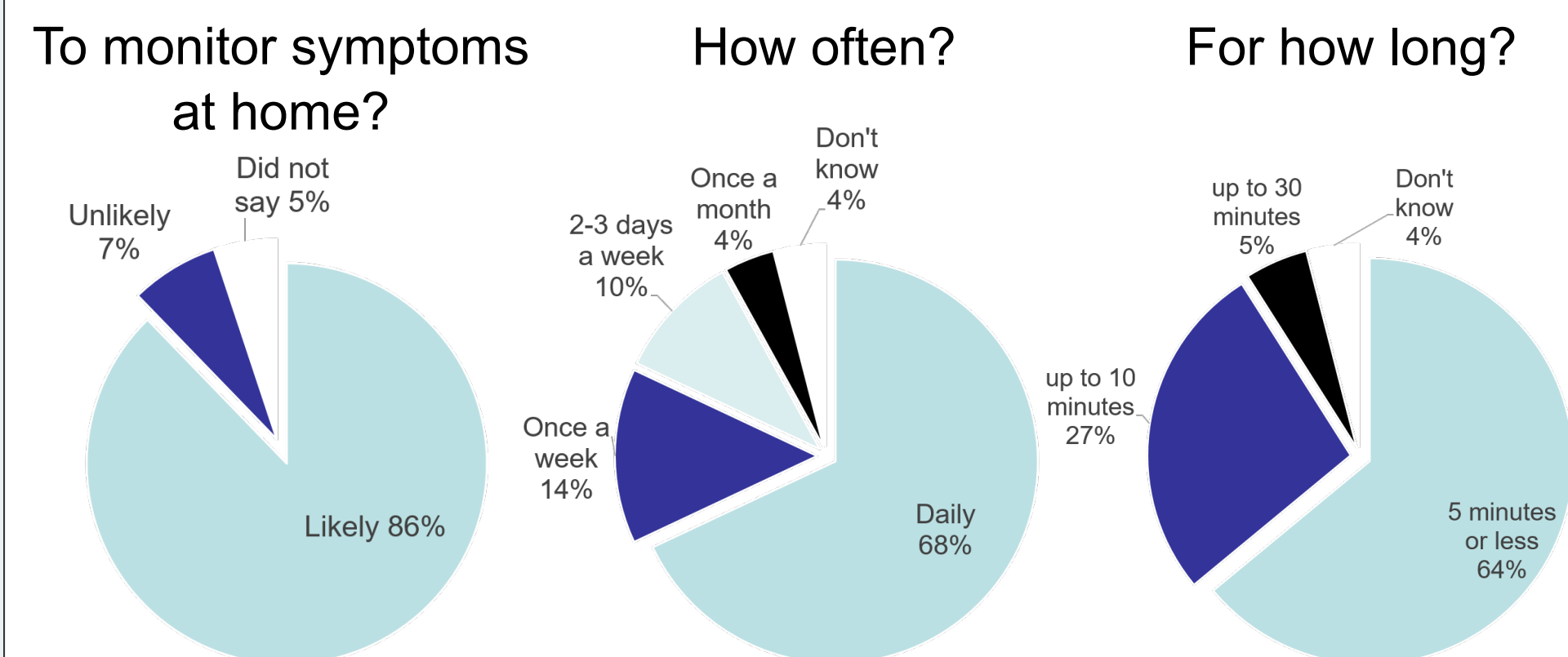


1 The problem

There are approximately 100,000 people in the UK with Parkinson's Disease – a neurodegenerative condition characterised by diverse symptoms including tremor, slowness and cognitive/mood changes. An accurate assessment of these symptoms, and how they respond to treatments, is critical for clinical care, especially when deciding to implement expensive advanced therapies such as Deep Brain Stimulation. But how can we achieve this when sometimes symptoms vary hour-to-hour, yet clinic visits are restricted to twice per year?

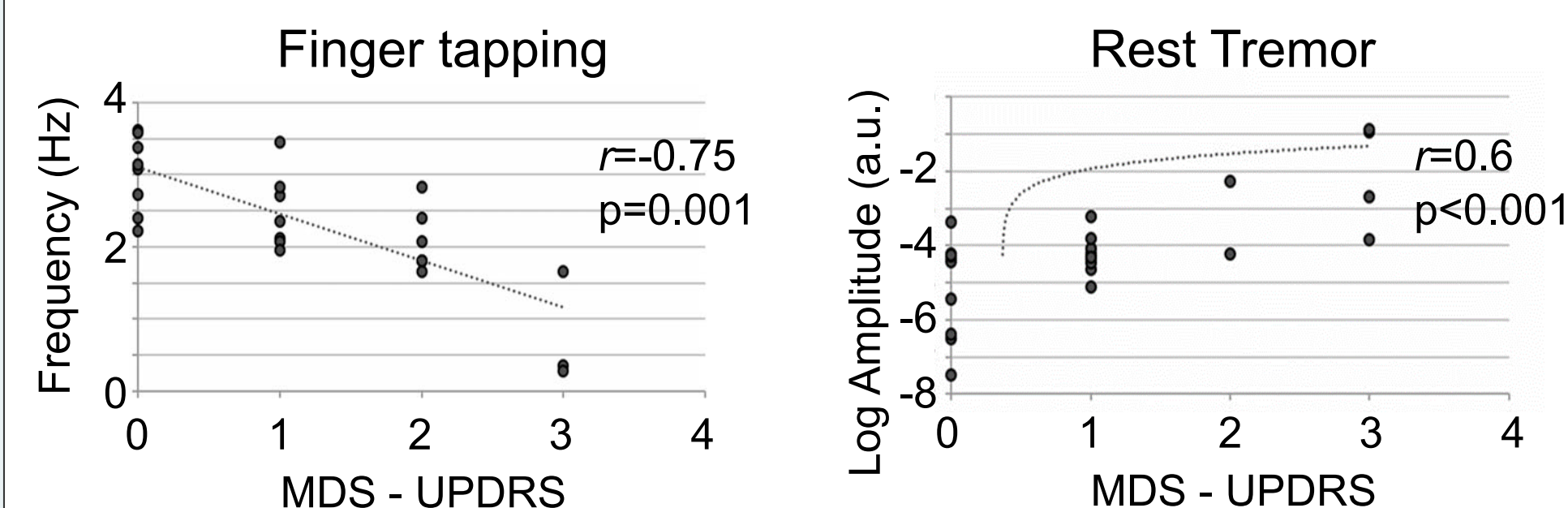
2 Would patients use a phone app?

(n=122)

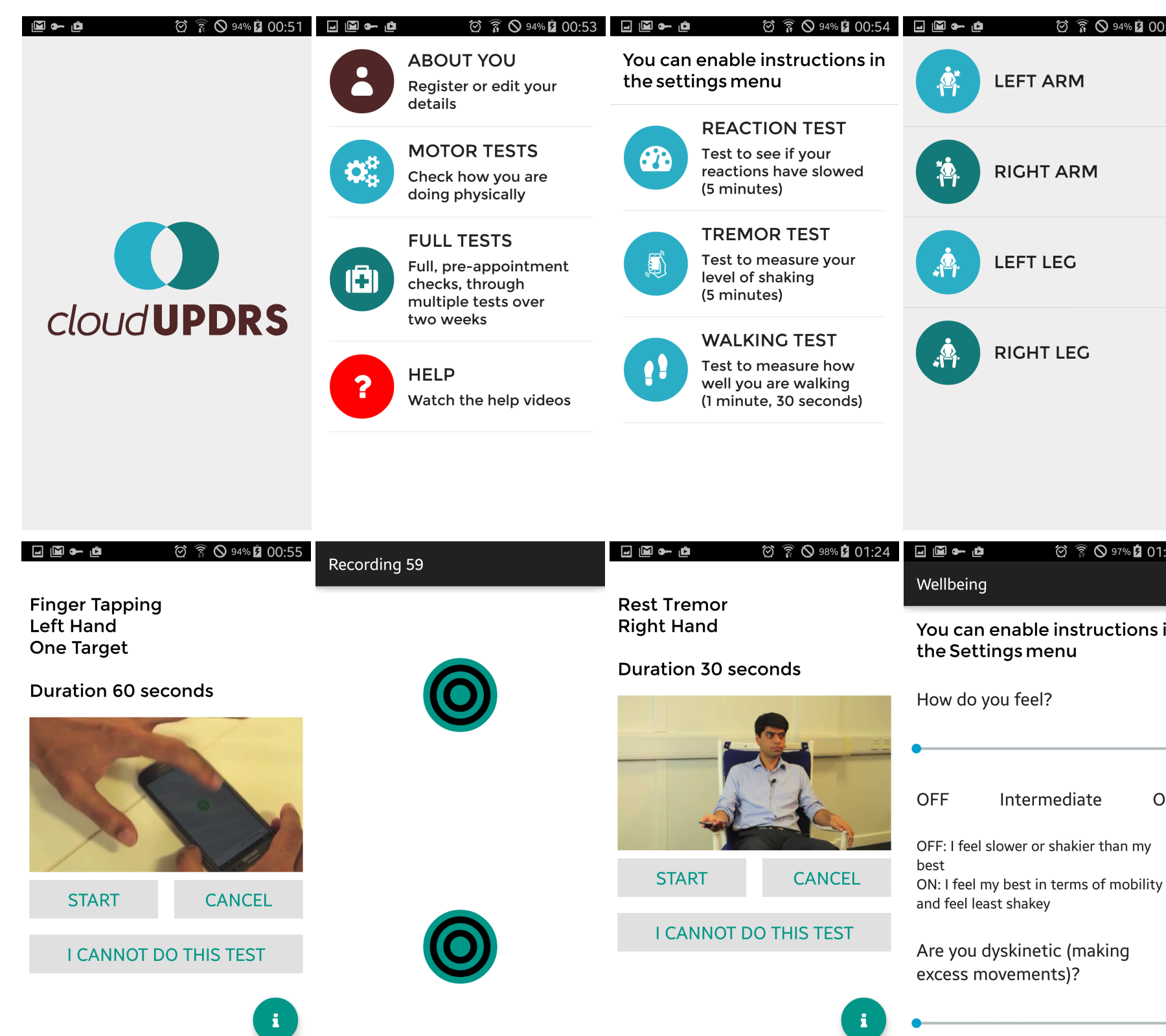


3 Can smartphone sensors be used to measure clinical signs in Parkinson's?

(n=14, Kassavetis et al. 2015)



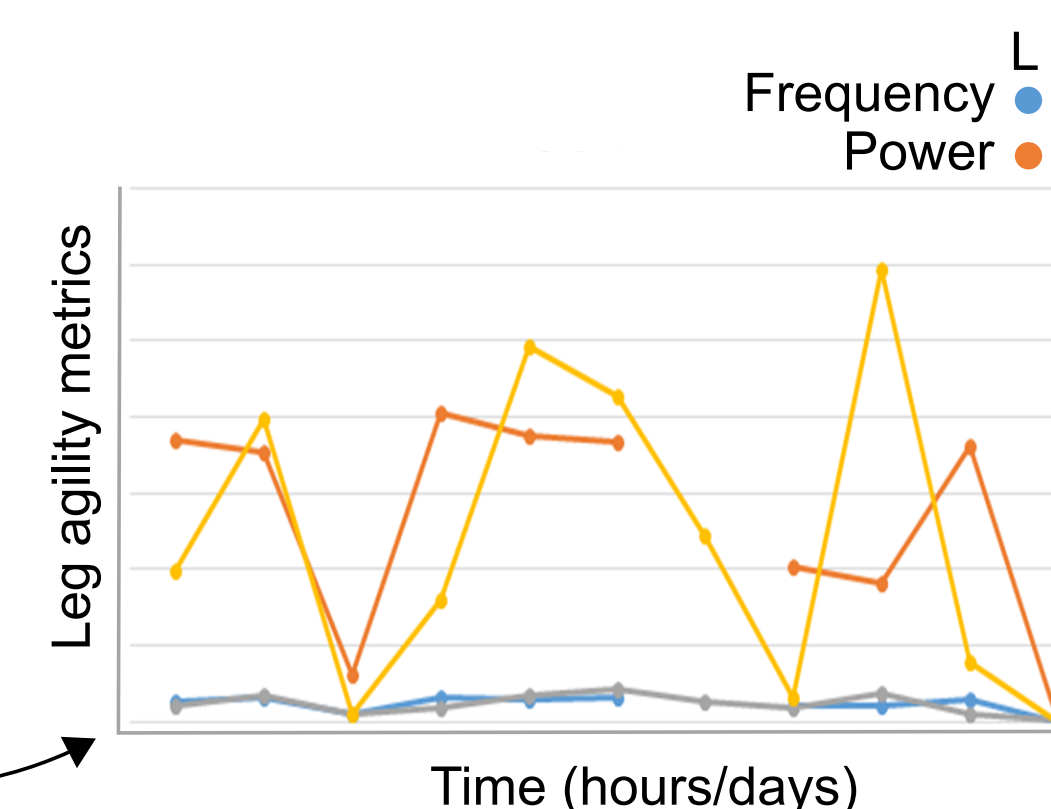
4 We developed the cloudUPDRS app



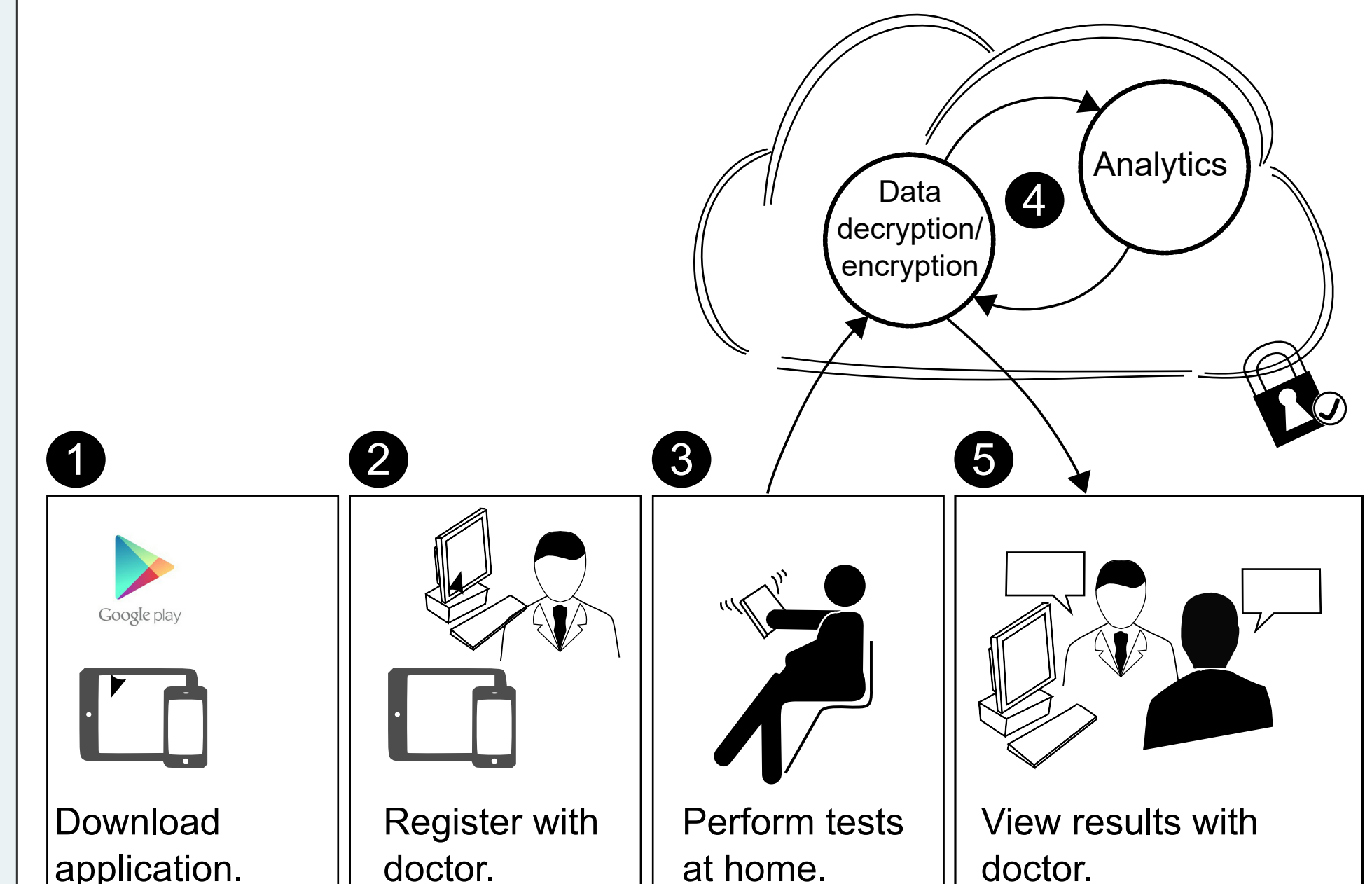
The app consists of 22 simple tests (e.g. tapping the screen of the phone to assess slowness, or holding the phone out to assess tremor) based on the Unified Parkinson's Disease Rating Scale (UPDRS), and questionnaires including the PDQ39.

Performing all the tests gives a full symptom overview.

Performing a few tests many times per day monitors hourly symptom variation.



5 How do patients and clinicians use the app?



Data from the phone is securely uploaded to a server and fed-back to the patient and clinician via a private website.

6 Progress and future direction

The app and associated service provision architecture has been CE certified as a medical device and we have published a proof-of-principle clinical study (Kassavetis et al. 2015).

We are currently conducting a clinical trial to validate the app as a UPDRS measurement tool. As the app develops, we hope it will provide real-time monitoring and big-data analytics for patients, doctors and clinical trials.