

Application of a digital monitoring platform to track severity and progression in Huntington's disease



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Introduction

- Huntington's disease is a rare, hereditary, progressive brain disease that causes problems with a person's ability to think, behave and move.^{1,2} Progressive means it gets worse over time.
- Signs and symptoms of Huntington's are usually assessed during visits to the doctor, which may not happen often enough to continuously track how the disease evolves over time.
- Advances in wearable sensors and communication technologies have enabled monitoring of a patient's symptoms from their own home, with the use of a digital monitoring platform consisting of a smartwatch and a smartphone.³⁻⁵

The Roche Huntington's disease digital monitoring platform is being used across the tominersen global Clinical Development Programme

- Tominersen is a medication currently in clinical development and not yet approved for Huntington's.
- It is designed to target the underlying cause of the disease and has the potential to slow or stop the progressive nature of the disease.
- Roche has a comprehensive clinical development programme investigating the dosing, safety and potential clinical benefits of tominersen in people with Huntington's.

The digital monitoring platform uses smartwatch- and smartphone-based technology to monitor the evolution of Huntington's symptoms across multiple studies in tominersen's Clinical Development Programme

Open-label extension (NCT03342053)* (46 patients)

• Objective: Assess safety and the body's responses to tominersen in patients with early movement symptoms over 15 months

Completed

HD Natural History Study (NCT03664804) (95 patients)

• Objective: Collect data on disease in individuals not receiving tominersen in patients with early movement symptoms over 15 months

GEN-EXTEND (NCT03842969)

Objective: Continue to assess safety and effectiveness of tominersen once patients have completed other studies

GENERATION HD1 (NCT03761849) (791 patients)

• Objective: Investigate safety and effectiveness of tominersen in patients with movement symptoms over 25 months (plus follow-up)

A study run by UCL is also using the digital monitoring platform to measure symptoms in different groups of people



Digital-HD (120 participants)

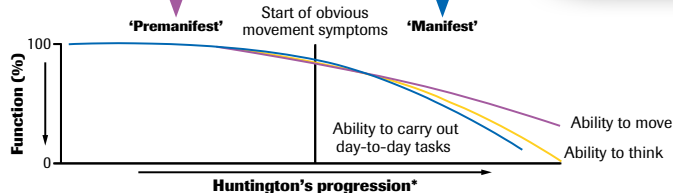
• Objective: Investigate the suitability of the digital monitoring platform in healthy individuals and individuals with Huntington's

* The open-label extension study was an extension of the original Phase I/IIa study of tominersen which included the same 46 patients.

Performance in digital tests worsens as Huntington's progresses

Huntington's progresses because of small, detectable changes in the brain. Initially there are no signs or symptoms. This then progresses to small but measurable changes in a person's behaviour, ability to move and think (called premanifest) and finally, the patient develops more obvious symptoms which can lead to a diagnosis (called manifest)^{1,2}

Symptoms gradually worsen; a person's ability to do everyday tasks gets continually worse leading to a loss of independence^{1,2}



- The results of the Digital-HD study have shown that individuals with manifest Huntington's had reduced performance in most digital tests compared to those with premanifest Huntington's and healthy individuals.⁷
- These results suggest that the digital monitoring platform can effectively monitor the evolution of Huntington's symptoms, which has the potential to help patients and clinicians to more effectively manage this disease and improve quality of life.

* Figure adapted from Ross CA, et al. *Nat Rev Neurol*. 2014; 10:204-216 and Walker FO. *Lancet*. 2007; 369:218-228.

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Conclusions

- The Roche Huntington's disease digital monitoring platform allows for symptoms to be captured at home, in between scheduled visits to the doctor, and has the potential to serve as a tool that would allow doctors to monitor the evolution of a patient's disease over time, remotely and more frequently.³⁻⁵
- Digital tests have been inspired by disease understanding and existing tests performed at the doctor's clinic, and may help the patient and clinician to more effectively manage this disease and improve quality of life.
- The majority of patients in the open-label extension study had a positive experience with the digital monitoring platform and regularly completed most of the digital tests.

Patient experience with the digital platform during the open-label extension study was positive



72%

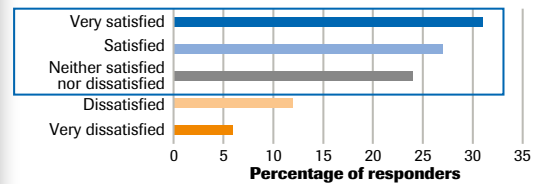
of patients answered the satisfaction questionnaire



83%

of patients were positive or neutral towards the digital monitoring platform

Taking all things into account, how satisfied or dissatisfied are you with the Huntington's study phone, watch and monitoring app?



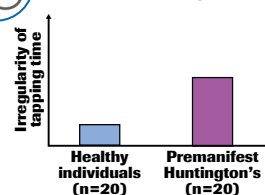
Participants in the open-label extension study performed daily tests on more than 5 days per week, suggesting patients were willing to use the digital monitoring platform on a regular basis

Digital upper body tests showed a difference between individuals with premanifest Huntington's and healthy individuals in the Digital-HD study⁷

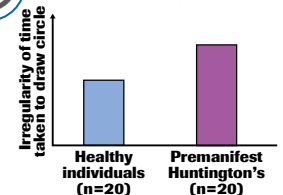
- Individuals with premanifest Huntington's performed less consistently in tests involving hand and finger movements (Speeded Tapping Test and Draw-a-Shape Test) compared with healthy individuals.
- The differences in hand and finger movements identified by digital tests may allow doctors to identify subtle movement problems which can't be detected at regular visits to the clinic and which may represent very early manifestations of the disease.



Speeded Tapping



Draw-a-Shape



* Figures adapted from Tortelli R, et al. *Neurotherapeutics*. 2019; 16:1350-1390.S74.

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