

# Contribution of a Tablet-Based Tests to the Diagnosis of Neurocognitive Disorders in Older Adults: A Feasibility Study

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**Abstract.** Neurocognitive diseases are diagnosed in specialized centers such as memory clinics, where the waiting time can be long. The reference assessment involves a battery of tests carried out by a specialized team. Facilitating screening in primary care using new technologies could make it possible to appropriately direct care pathways towards specialist care. This work aimed to set up a battery of questionnaires, cognitive and manual dexterity tests on a digital tablet to screen people with cognitive impairment. Three groups of people are recruited from a memory consultation: people with major neurocognitive disorders, people with mild neurocognitive disorders and people with no cognitive impairment. Initial results in geriatric settings show that the digital tablet assessment test is feasible and well accepted, but that manual dexterity assessment needs to be adapted to the bodily particularities of the very old.

**Keywords.** tablet, older adult, neurocognitive disorder, manual dexterity, diagnosis.

## 1. Introduction

Neurocognitive disorders are diagnosed by a team of specialized professionals in memory consultation centers. Diagnosis requires a battery of tests including an extensive and time-consuming neurocognitive assessment. These centers are not accessible in all locations, where waiting times can take several months. This is an important period for early stimulation. Research is underway to develop neurocognitive testings on digital tools such as tablets [1] in order to facilitate screening in primary care setting. A previous study by members of our team has shown interesting results on the impairment of manual dexterity during the progression of Alzheimer's disease [2]. We aimed to produce a fast and easy-to-use testing on a touchscreen tablet, using a combination of simple

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questionnaires, cognitive and manual dexterity tests; a screening tool that could be offered to non-specialists in primary care.

## 2. Methods

*Participants:* We recruited consecutive participants from the memory clinics of two geriatric hospitals who completed a battery of neuropsychological tests, as well as participants without cognitive impairment from the city through seniors' associations.

*Material:* We used a Samsung Galaxy Tablet A8 with a simple stylus pen. We have chosen this equipment with a perspective of accessibility.

*Procedure:* All participants completed the same battery of testings on tablet, including self-questionnaires, cognitive tasks (including the clock drawing test). We also included manual dexterity exercises newly designed for the tablet and measure psychomotor symptoms such as minor neurological signs. It lasted around 1 hour and administered by a trained investigator. In addition, participants answered to a user experience questionnaire.

## 3. Preliminary Results, Discussion and Conclusion

We included 122 participants whose age was  $83 \pm 3.5$  and who comprised 91 women (75%) and 31 men (25%). Test feasibility was excellent, as we had not refusals or overall failures. All participants answered the self-questionnaires without difficulty. Two participants refused the clock drawing test: one said it exhausted him, and the other for no clearly expressed reason. Three participants did not complete the manual dexterity test: 2 refused and 1 encountered technical problems that made it impossible to record the test. We experienced a number of technical issues during the manual dexterity exercise: detection of older people's fingers was a bit tricky, due to dry skin, deformation of the hand (thumb inwards) or the position of the hand to be held. Acceptability assessed by the user experience questionnaire was good. In accordance with the protocol, analysis of the performance of the test and of each subtest for the diagnosis of cognitive disorders will be carried out after inclusion of all participants ( $n=160$ ).

Overall feasibility and acceptability were good, even if the feasibility of manual dexterity tests needs to be improved. Inclusion in the study is still ongoing, and analyses have yet to be completed. Our aim is to explore our data to define profiles for the 3 neurocognitive conditions based on statistical analysis and classification methods.

## References

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