2018 Seed Funding Competition Awardees

Title: Immersive Virtual Reality Based Assessment and Treatment of Cognitive Deficits in Schizophrenia.
PI: George Foussias

Abstract: Background: Cognitive deficits (i.e., difficulties with attention, memory, and executive function) have emerged as a critical predictor of the enduring functional disability individuals with schizophrenia experience, and for which there remain no effective treatments. One promising approach has been computerized cognitive training, although this typically relies on drill-and-practice using abstract cognitive tasks, with limited real-world benefits for patients. Advances in immersive virtual reality technology affords an opportunity to investigate and treat cognitive deficits experienced by individuals with schizophrenia in a simulated real-world environment where such impairments have functional consequences. The proposed study aims to investigate a novel immersive virtual reality-based cognitive training platform (bWell) developed by the National Research Council of Canada for the rapid initial assessment of cognitive deficits in schizophrenia and their subsequent treatment. This study will conduct clinical validation and usability testing of the bWell platform for cognitive assessment in 40 individuals (Phase 1), with a subset of 20 individuals taking part in a clinical trial to evaluate the safety and preliminary efficacy of bWell for treating cognitive deficits and functional disability in schizophrenia (Phase 2). Objectives and Hypotheses

Objective 1: To investigate the usability and validity of bWell for indexing cognitive deficits in patients with schizophrenia. Hypothesis 1: bWell will be engaging and have limited side effects, with performance related to traditional cognitive assessments and community functioning. Objective 2: To evaluate the safety, tolerability, and preliminary efficacy of bWell for treating cognitive deficits in schizophrenia. Hypotheses 2A: Cognitive training with bWell will be well-tolerated and engaging, with minimal side effects.

Hypothesis 2B: Cognitive training with bWell will lead to improved cognition and community functioning in individuals with schizophrenia. Methods

Stable outpatients with schizophrenia will be recruited for the Phase 1 clinical validation study, with these participants also invited to take part in a Phase 2 cognitive remediation trial. Participants will complete a single Phase 1 study visit consisting of: 1) cognitive testing and assessments of psychiatric symptoms and community functioning; 2) administration of the immersive bWell cognitive assessment program; and 3) evaluation of side effects and user experience. In the Phase 2 treatment trial, participants will be administered the bWell cognitive training program over 8 weeks. Side effects will be evaluated at each treatment visit, along with overall symptoms every two weeks, and with cognitive and other initial assessments from Phase 1 repeated after completion of treatment and at 1-month follow-up. Significance

Schizophrenia affects a large proportion of Canadians and is associated enduring disability. Cognitive impairments are a critical determinant of this functional disability, for which there are currently no

effective treatments. The results of this study are anticipated to provide evidence for a rapid new method for evaluating cognitive impairments, and provide preliminary evidence for the safety and efficacy of an immersive virtual reality-based treatment for these impairments that can improve the lives of individuals with schizophrenia. This will set the stage for a larger clinical trial to confirm our findings and support the implementation of this approach in routine clinical care for schizophrenia.