NeuroTracker applications for Parkinson’s

Background
Perceptual and cognitive causes of Parkinsonian mobility issues and fall risk
Parkinson’s disease is a motor syndrome whose main symptoms are tremor at rest, stiffness, slowing of movement and postural instability. However, cognitive deficits may contribute significantly to inaccuracy of perceptual judgment and has the potential to contribute to Brighkinesia behaviours such as tripping and falling. Specifically, published research has identified cognitive deficits in sustained attention, higher-order motion perception and dual-tasking (performing a cognitive task while walking).

What this means is that there is a significant “top-down” cognitive decline that leads to observed motor deficits in patients, including general slowness of movement, freezing of gait, and start/turning hesitation. Addressing the root cognitive causes could help alleviate the physically and socially debilitating effects of Parkinson’s disease.

The problem
Physical immobility and isolation
Mobility issues, falls and Brighkinesia have a devastating impact in the lives of PD patients. Fear of falling in itself can have an incapacitating effect in PD patients and can result in social exclusion leaving patients largely isolated, leading to depression and further cognitive decline due to a lack of social interaction. Immobility can also lead to osteoporosis which in-turn facilitates future fracture development. This then becomes a vicious circle with falls leading to immobility and immobility facilitating future falls; as well as cognitive decline leading to social withdrawal, which in turn accelerates cognitive decline.

Neurotracker training
Enhancement through neuroplasticity: improve cognitive function, mobility and quality of Life.
Neuroplasticity, the ability of the brain to physically change and reorganize to adapt to new challenges, is lifelong and has been observed even in Parkinson’s disease. NeuroTracker harnesses this innate ability to train attention, and higher order visual perception to help individuals to better perceive and process what they see. As mentioned above, research has shown that these perceptual and cognitive functions are a significant cause of Parkinson’s-related motor problems and cognitive decline – their improvement would lead to significant improvement in mobility and of quality of life. Research has already shown that NeuroTracker transfers to real-life tasks, and that improvements are seen in multiple populations.

Summary
The University of Montreal has received a grant from Parkinson Society Canada to evaluate NeuroTracker as a specific intervention to improve cognitive function in Parkinson’s. This is due to its demonstrated capacity to train and improve fundamental perceptual and cognitive abilities relevant to the mobility issues related to Parkinson’s disease. Training will improve those “top-down” processes fundamental to perceiving the world around us, and lead to greater freedom of movement, social interaction and quality of life.

References