INTRODUCTION

Parkinson’s disease and essential tremor are two common movement disorders that are treated in the Parkinson’s and Movement Disorders Clinic at Froedtert & MCW. These are debilitating disorders that can cause significant disruption to patients’ lives. Two treatment options for these patients are medication and deep brain stimulation (DBS). However, treatment management is a time-consuming process for patients and caregivers alike. We are using iPhone apps to provide mobile monitoring of the motor response to therapy, and to provide support for clinical decision making. This data is wirelessly transmitted to and from the Movement Disorders Databank, where it is analyzed and integrated with clinical rating scales that are captured in the Patient Management System. The long term goals of this project are to improve therapeutic effectiveness and reduce the patient burden.

GOALS

1. Devise a method to provide quantitative measures of treatment effectiveness in the patient’s home environment
2. Provide visual feedback and decision support for clinicians on the effectiveness of deep brain stimulation

iPhone Apps for Patient Monitoring & Clinical Decision Support

Home Monitoring of Movement Disorders Patients

Interactive Visualization for Clinical Decision Support

The iPhone app records patient movement and wirelessly uploads the data to a server. In addition, patients keep a diary of medications and activities.

Patient-specific computational models are constructed to show the location of DBS electrodes relative to the patient anatomy, as well as predictions of the volume of activation induced by stimulation.

Future Work

We are now planning a pilot study to evaluate the utility of the motion tracking app for home monitoring of Parkinson’s and essential tremor patients. In addition, we have begun to use interactive visualization as a clinical and research tool to better understand the effects of DBS on motor and neuropsychological aspects of movement disorders.

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