Wearable Devices: Revolutionary Tools for Parkinson’s Disease Research

Parkinson’s disease (PD) progression varies widely from patient to patient. To date, it has been nearly impossible for researchers to capture a truly accurate picture of the diverse day-to-day experiences of people living with PD. This, in turn, slows progress toward a cure. But, today, the new field of “wearable technology” has the potential to revolutionize the way we collect this critical information from patients.

In the simplest terms, wearable devices are electronics that can be worn on the body to collect different kinds of data. A pedometer, for example, is a basic and well-known wearable device that collects the number of footsteps, distance traveled and speed of the person wearing it. Other wearable devices available today are a bit more complex than a pedometer, and can include features like an accelerometer that detects and measures motion or a heart rate monitor that measures heartbeat. These devices typically include an interface that can share, report and display the data being collected. Some popular examples of today’s newer wearable devices include the Fitbit, Apple Watch, Jawbone and even everyday smartphones.

At a typical doctor’s appointment, a physician completes a five to ten minute in-person assessment of a Parkinson’s patient’s motor symptoms. This brief snapshot of a patient’s experience with PD only represents one percent of their time, and provides little insight into the other 99 percent of daily life with Parkinson’s. Compared to these standard, in-person assessments, wearable devices offer the opportunity to capture more comprehensive information about a person’s movements over a long duration of time. In fact, some wearables collect 300 data points per person per second. This data can provide useful information for patients, clinicians and researchers. It will help scientists better understand what patients experience throughout the course of their disease, allowing them to focus their research to address patients’ unmet needs. In sum, wearable devices have the potential to revolutionize how we understand Parkinson’s and conduct PD research.

Wearable Devices: Why Now?

While data gathered from wearable devices cannot fully replace in-person motor assessments, it is expected to play a key role in disease assessment and treatment in the future. So, if these devices have so much potential, why are we just hearing about them now? Ultimately, there are three reasons:

1. **Size**: Today’s wearable devices are tiny compared to those used historically, allowing patients to wear them with ease as they go about their daily lives and making data collection especially convenient.
2. **Data and Analytics**: The evolution of computer technology and the emergence of “Big Data” have made it possible to analyze the enormous sets of information that wearable devices can collect.
3. **Cost and Accessibility**: Compared to the large, complex machines previously used to collect information about movements associated with Parkinson’s disease, today’s wearable devices are relatively inexpensive. Previously, these devices could be purchased only by medical facilities for use in research, but today, everyday consumers can purchase wearable devices directly.
Over the past 10 years, there have been many studies using wearable devices to collect measures of Parkinson’s disease. As described above, these devices have typically been large, cumbersome and expensive. But today, wearable devices are more sophisticated than ever, and scientists can now use them to gather larger amounts of data than was previously possible. Furthermore, a new field called “machine learning” has emerged, allowing for the analysis of the massive amounts of longitudinal data (collected repeatedly over a period of time) that can be gathered from wearable devices. Both the large amounts of data and new technologies for analyzing them may yield new insights for Parkinson’s research.

**Parkinson’s Research and Wearable Devices: What’s Next?**

Given these exciting developments, The Michael J. Fox Foundation for Parkinson’s Research is conducting a study called Fox Insight Wearables that allows scientists to collect data on life with PD using wearable technology. This study is entirely virtual — all data will be gathered through a smartwatch and smartphone app — and volunteers can participate from their own homes. Participants will be asked to use these devices to track their movements and input information about their symptoms and medication intake. The goals of this study are two-fold: 1) to collect data using smartwatches and smartphones to track and monitor people with Parkinson’s symptoms, and 2) to develop computer programs that can estimate and predict PD symptoms.

Individuals who have Parkinson’s, are over the age of 18 and own and use a smartphone are eligible to participate in the study.

Collecting data about Parkinson’s disease through wearable devices has the potential to revolutionize PD research. To get involved or to learn more about this study, visit michaeljfox.org/wearfoxinsight.