



***The leader in remote monitoring  
of movement disorders***

Robert N. Schmidt, MS, MBA, JD, PE

Chairman and CEO

[rschmidt@glneurotech.com](mailto:rschmidt@glneurotech.com)

(216) 374-7237

# Great Lakes NeuroTechnologies Management Team



**Dustin A. Heldman, PhD**  
President and COO



**Robert N. Schmidt, MS, MBA, JD**  
Chairman and CEO



**Brian M. Kolkowski, PhD**  
Exec. VP & General Counsel



X 2



X 7



X 15



X 10



X 2



# Parkinson's Market

The direct medical costs of Parkinson's disease in the US was \$25.4 billion 2017. Thus, the cost for each of the 1.04 million Parkinson's patients is \$24,439 every year.\*

This does not include worldwide markets and other movement disorders such as essential tremor.

\*Yang, W., Hamilton, J.L., Kopil, C. *et al.* Current and projected future economic burden of Parkinson's disease in the U.S.. *npj Parkinsons Dis.* **6**, 15 (2020).

# Parkinson's is Difficult to Manage

**The Parkinson's disease treatment market is expected to reach \$12.1 Billion by 2030**



**Therapy optimization requires repeated visits over a period of months to years, and then starts all over.**

# The Solution: Kinesia™ Objective Motor Assessment

- ✓ Commercial Stage
- ✓ FDA-Cleared and CE-Marked
- ✓ Clinically Validated
- ✓ Revenue-generating
- ✓ Financed with non-dilutive funding
- ✓ Over 55 issued US and international Patents
- ✓ Gold-standard for Parkinson's disease and essential tremor assessment in clinical trials

## GLNT's Leading Edge Commercial Space

- Digital Therapeutics
- Wearable Wireless Monitors
- Personalized Precision Medicine
- Testing as a Service (TaaS)
- Proprietary positions for AI/ML/IoMT

## Sample of Companies Using

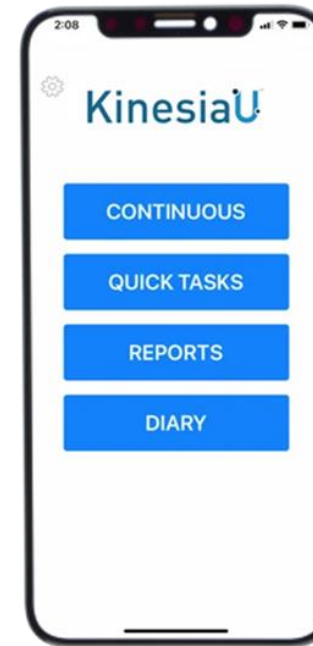
### Kinesia technology



# Validated Smartwatch Patient Monitoring



- Validated, low-cost prescription app for individuals to measure Parkinson's disease or essential tremor symptoms using their own smartphones and smartwatches
- Convenient data reports help patients and clinicians make better decisions about their care and identify therapies and activities that best impact their symptoms.



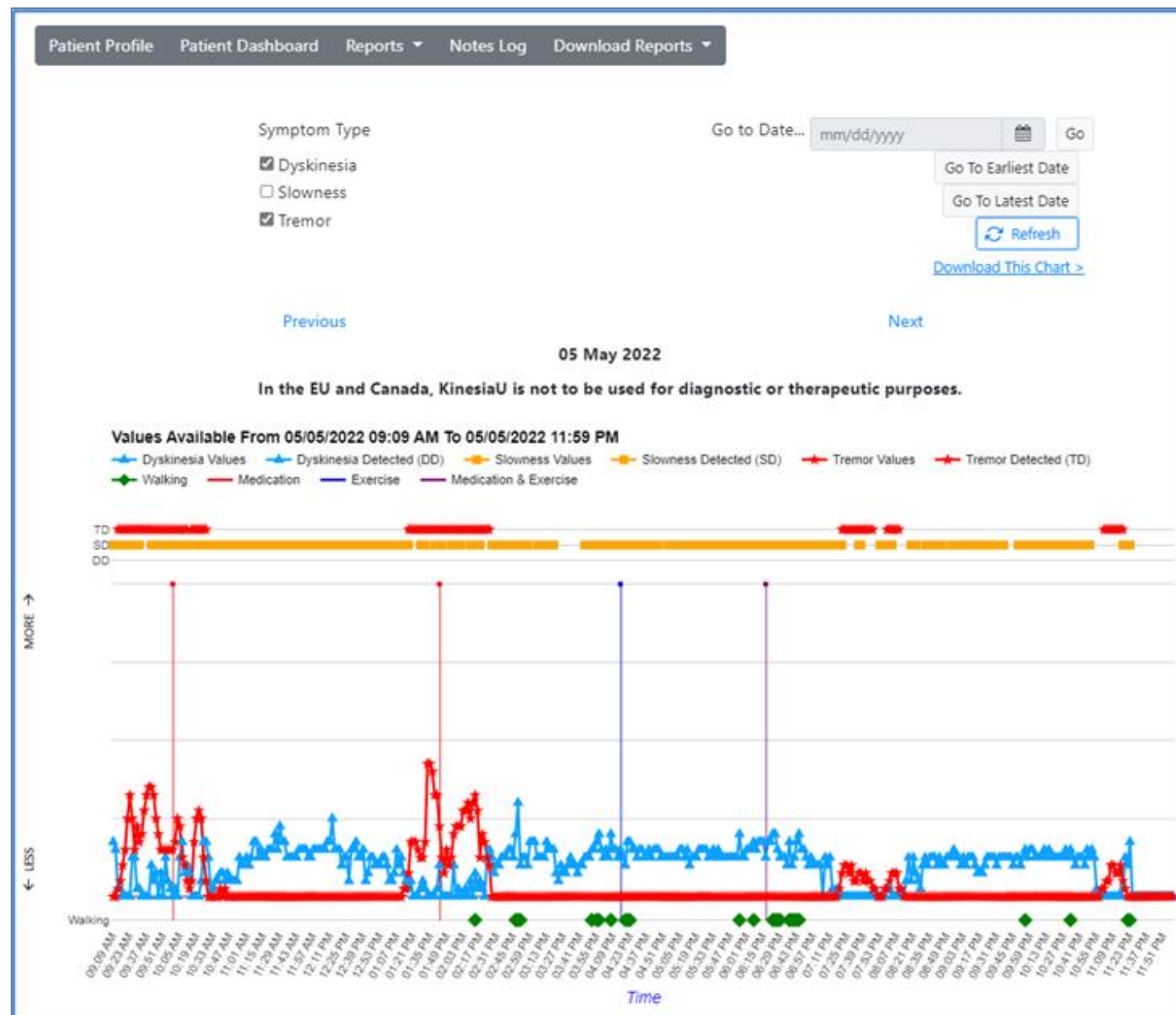
*FDA-Cleared and  
CE-Marked*



- Tracks **tremor, slowness, dyskinesia, and walking** as well as therapies and activities in user-friendly reports.
- Reports show symptoms over the course of a day and across days, weeks, months, and years in response to therapy and activities.
- Customizable medication reminders and diaries

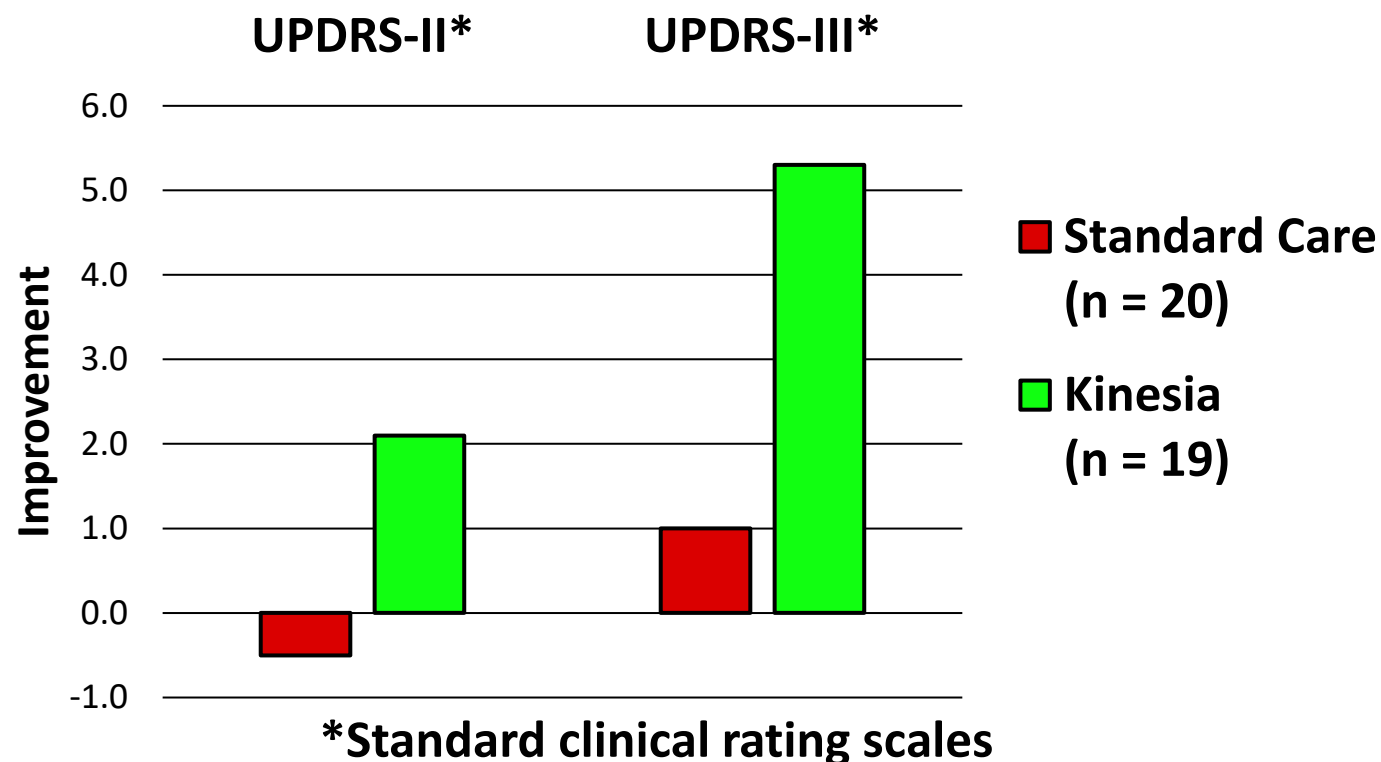


# Continuous Report



# Published Real-World Evidence

- ✓ Over 80 publications
- ✓ Remotely titrate drugs & reduce office visits
- ✓ Assist with clinical decision making
- ✓ Improve engagement & therapy compliance
- ✓ Increase referrals for advanced therapies
- ✓ Improve the therapeutic benefits of DBS



Published

Isaacson S, Boroojerdi B, Waln O, McGraw M, Kreitzman D, Klos K, Revilla F, Heldman D, Phillips M, Terricabras D, Markowitz M, Woltering F, Carson S, Truong D (2019) Effect of using a wearable device on clinical decision-making and motor symptoms in patients with Parkinson's disease starting transdermal rotigotine patch: A pilot study. *Parkinsonism and Related Disorders*.



# CPT Codes Cover RPM with KinesiaU

RPM Codes	Description	Rates	Coverage & Characteristics
99453	Initial setup of the device, including patient education on how to use it and how to connect it with other devices.	\$19	<ul style="list-style-type: none"> <li>• Categorized under <b>evaluation &amp; management (E/M) services</b></li> <li>• Monitoring <b>physiological parameters</b> such as heart rate, blood pressure pulse oximetry, and respiratory flow rate</li> <li>• Using a connected device that <b>automatically transmits data</b>. <b>Does not cover</b> patient self reported data.</li> <li>• Only physician &amp; non-physician practitioners <b>eligible</b> to provide <b>E/M services</b> may bill for RPM</li> </ul>
99454	Monthly remote monitoring with daily recordings. Billed each calendar month; must have minimum of 16 days monitoring	\$56	
99457	Monitoring & treatment mgmt., may include dialogue between patient or caregiver that totals at least 20 minutes in a month	\$50	
99458	Each additional 20 minutes of monitoring & treatment mgmt. services provided. Total interaction is limited to 60 minutes.	\$41	
99091	Time for clinical staff to gather, interpret & process data, at least 30 minutes every 30 days. Not require interactive communication with patients.	\$56	

# Billing Model

Patient receives KinesiaU prescription

Patient downloads KinesiaU app from App Store (currently no download or subscription fee charged to patient)

Clinician bills insurance for all four CPT codes as applicable

GLNT bills clinician (not insurance) for access to KinesiaU web portal

# Increased Clinical Revenue Example 1

- Light use
  - Clinic with 5 providers sees 1,500 PD patients with 10% KinesiaU utilization in first year = 150 patients using KinesiaU
  - Patients use KinesiaU for all 12 months, clinicians review each patient's data 2 months per year
  - Clinic bills 99453 1x, 99454 12x per year, and 99457 2x per year for each patient
  - GLNT charges \$60 per patient per month when clinician accesses portal data

	Per patient per year	Total per year
Increased Clinical Revenue	\$791	\$118,650
KinesiaU Portal Subscription Cost	\$120	\$18,000
<b>Net Increased Clinical Profits</b>	<b>\$671</b>	<b>\$100,650</b>

# Increased Clinical Revenue Example 2

- Moderate use
  - Clinic with 5 providers sees 1,500 PD patients with 15% KinesiaU utilization in first year = 225 patients using KinesiaU
  - Patients use KinesiaU for all 12 months, clinicians review each patient's data an average of 2.5 times per year
  - Clinic bills 99453 1x, 99454 12x per year, 99457 2.5x per year for each patient
  - GLNT charges \$60 per patient per month when clinician accesses portal data

	Per patient per year	Total per year
Increased Clinical Revenue	\$816	\$183,600
KinesiaU Portal Subscription Cost	\$150	\$33,750
<b>Net Increased Clinical Profits</b>	<b>\$666</b>	<b>\$149,850</b>

# Increased Clinical Revenue Example 3

- Widespread use
  - Clinic with 5 providers sees 1,500 PD patients with 20% KinesiaU utilization in first year = 300 patients using KinesiaU
  - Patients use KinesiaU for all 12 months, clinicians review each patient's data an average of 3 times per year, with half the cases requiring additional clinician time
  - Clinic bills 99453 1x, 99454 12x per year, 99457 3x per year for each patient; 99458 1x per year for half the patients
  - GLNT charges \$60 per patient per month when clinician accesses portal data

	Per patient per year	Total per year
Increased Clinical Revenue	\$861.50	\$258,450
KinesiaU Portal Subscription Cost	\$180	\$54,000
<b>Net Increased Clinical Profits</b>	<b>\$681.50</b>	<b>\$204,450</b>

# Key Value Drivers (part 1)

KinesiaU will be a biomarker for PD and become an integral part of disease management that drives referrals, thereby accelerating revenue growth for specific therapies.

Better real-world evidence allows for efficient and accurate therapy titration and ultimately on-demand dosing based on artificial intelligence algorithms to minimize symptom severities without causing side effects.

Personalized, precision medicine provided by KinesiaU reduces excessive office visits for therapy adjustment saving patients time and money.

Availability of remote monitoring will encourage patients to opt for and clinician to prescribe specific therapies and improve compliance.



# Key Value Drivers (part 2)

Provides a delivery solution as part of a combined therapy that can extend a therapy manufacturer's proprietary position.

Large database of real-world patient outcomes can be monetized by selling to therapy manufacturers and payers interested in monitoring therapy effectiveness.

Reimbursement codes reduce costs for devices for pharmaceutical companies wanting to link their products with companion devices and encourage physicians to better follow the patient's therapy regimen.

Medicare and other payers will benefit by being able to show that lower cost generic drugs can be used most of the time if properly titrated. High-cost advanced therapies (DBS and pumps) can frequently be avoided.

# Everyone in the healthcare system loves KinesiaU

## Patients love it

- Better care
- Stay properly titrated
- Live longer, healthier life
- More stay-at-home touch-points with their doctor

## Physicians love it

- Better patient care
- See more patients in less time

## Payers love it

- Lowers total health care cost
- Keeps patient healthy longer
- Improves therapy compliance
- Avoids costly therapies until truly necessary

# Dual Paths to Significant Revenue Streams

***KinesiaU is ready for market now!***

***Remote Patient Monitoring CPT codes:  
99453, 99454, 99457, 99458***

**KinesiaU Direct Sales Model (US, UK, EU)**

Year	# of Sites	# of Patients	Revenue
Year 1	11	1,650	\$198,000
Year 2	45	10,125	\$1,518,750
Year 3	170	51,000	\$9,180,000
Total			\$10,896,750

**Increased Revenue for Strategic Partner**

Year		Therapy Alone	With Kinesia
Year 1	Market Share	5%	6%
	Revenue	\$250M	\$300M
Year 2	Market Share	8%	10%
	Revenue	\$400M	\$500M
Year 3	Market Share	10%	15%
	Revenue	\$500M	\$750M
Year 4	Market Share	13%	20%
	Revenue	\$650M	\$1B
Year 5	Market Share	17%	25%
	Revenue	\$850M	\$1.25B
Year 6	Market Share	20%	30%
	Revenue	\$1B	\$1.5B
	Total Increased Revenue	\$1.65B	

***NeuroDerm recently sold for \$1.1B***

# Market Drivers

“[D]isruptive business model innovation in health care...hold[s] the potential to reduce costs by between 20 and 60 percent, depending on the situation—while at the same time improving the quality and efficacy of care received.”

-Christensen, C. M., Grossman, J. H., & Hwang, J. (2009). *The innovator's prescription: A disruptive solution for health care*.

- KinesiaU can provide such a disruptive business model innovation
- Target is Medicare/CMS
- **Parkinson's was ~3.2% of the \$705.9B 2017 Medicare budget (source CMS)**

**Table 1.** Direct medical cost of Parkinson's disease by age, gender, insurance coverage, and types of service (in 2017 \$s).

	Total excess medical cost due to PD		Per PWP (\$)
	(in Million \$s)	Percentage of the total	
Insurance			
Private	1,742	7%	22,671
Medicare	22,793	90%	24,811
Other <sup>a</sup>	812	3%	19,489
Type of service			
Non-acute institutional care	7,144	28.2%	6,888
Hospital inpatient	7,190	28.4%	6,932
Outpatient	5,506	21.7%	5,308
Physician office	1,226	4.8%	1,182
Durable medical equipment	145	0.6%	140
Prescription medication	4,137	16.3%	3,988
Overall	25,348	100%	24,439

Modified from Yang, W., Hamilton, J.L., Kopil, C. *et al*. Current and projected future economic burden of Parkinson's disease in the U.S. *npj Parkinsons Dis.* 6, 15 (2020).

# Competitive Landscape

- ✓ Over 55 issued US and International Patents and Over 30 Pending Applications Covering:
  - Proprietary real-time monitoring
  - Data transfer
  - High-sensitivity sensors and algorithms
  - Artificial intelligence for quantifying symptom severities
  - Adjusting medication or neuromodulation therapy based on motor assessment
  - Open- and closed-loop therapy titration.
- ✓ Substantial commercially-valuable moat provides protection



# Strong IP Protection

## Over 55 Issued US and International Patents, and 32 US and Foreign Applications in Progress Covering:

- Sensor Based Monitoring of Movement Disorders (MD) Symptoms
- Telemedicine Applications/Patient Tracking
- High Sensitivity and Accuracy of System for Measuring MD Symptoms
- Artificial Intelligence for Quantifying Symptom Severity
- Adjusting Meds or Neuromodulation Based on Objective MD Motor Assessment Locally or Remotely
- Real-Time Patient Monitoring
- Clinically Validated Sensor Systems
- Accuracy of System for Measuring MD Symptoms
- Wireless Data Transfer and Monitoring
- Open and closed-loop therapy titration

***\*See Patents and IP deck for additional details.***



# *The Time for KinesiaU is now!*

- ✓ Technology, regulatory, and IP protection risk eliminated
- ✓ Efficient therapy titration
- ✓ Reduce office visits
- ✓ Drive referrals
- ✓ Proprietary delivery method



***KinesiaU will be the standard of care for all people with Parkinson's***

# Questions?

**Robert N. Schmidt MS, MBA, JD, PE**  
**Chairman and CEO**

**[rschmidt@glneurotech.com](mailto:rschmidt@glneurotech.com)**

**(216) 374-7237**

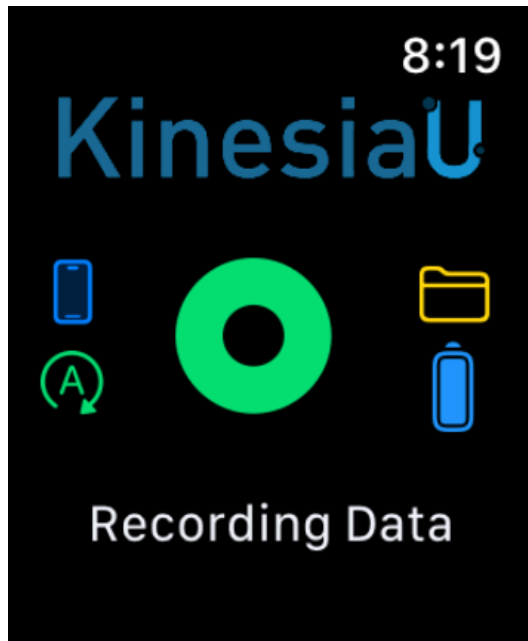
**[www.glneurotech.com](http://www.glneurotech.com)**



# KinesiaU Patient App Usage

# KinesiaU Continuous Recording

- KinesiaU is always recording in the background



No SIM

10:38 AM



## KinesiaU

Continuous Recording In Progress

Recording Data

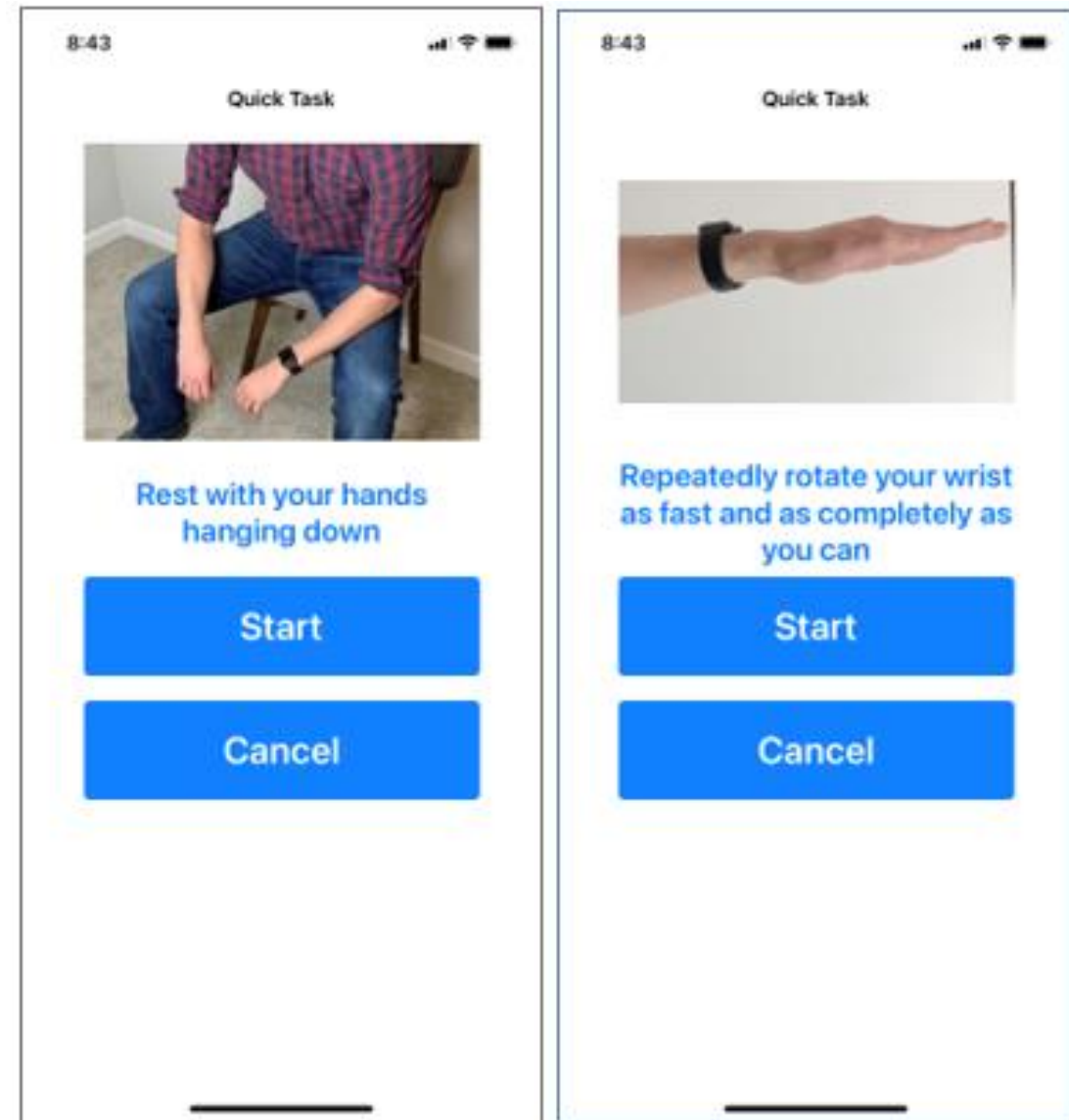
Quick Tasks

Reports

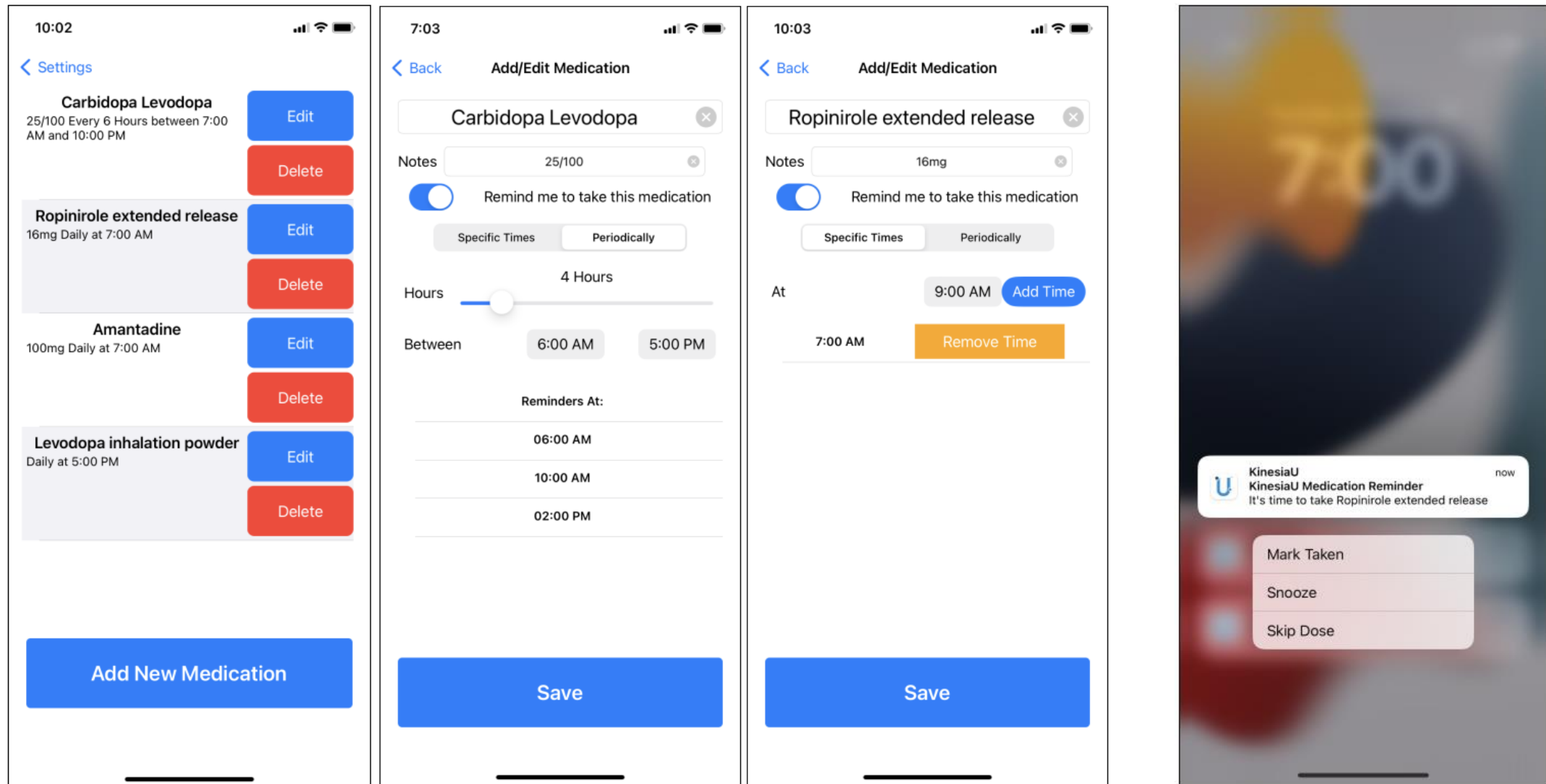
Diary

# KinesiaU: Quick Tasks

- Quick tasks are optional assessments of tremor, bradykinesia and dyskinesia
- User will be prompted to complete two different 7-Second tasks in the following order: Arms resting, Wrist rotation



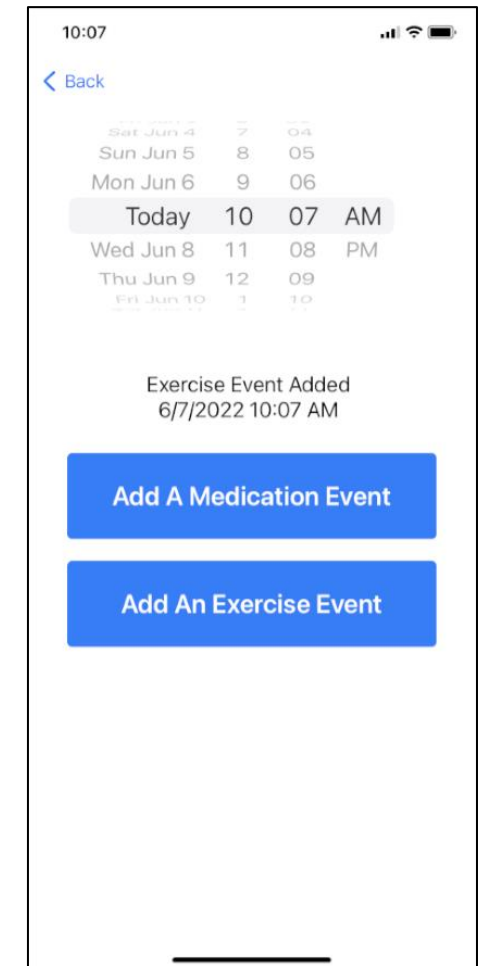
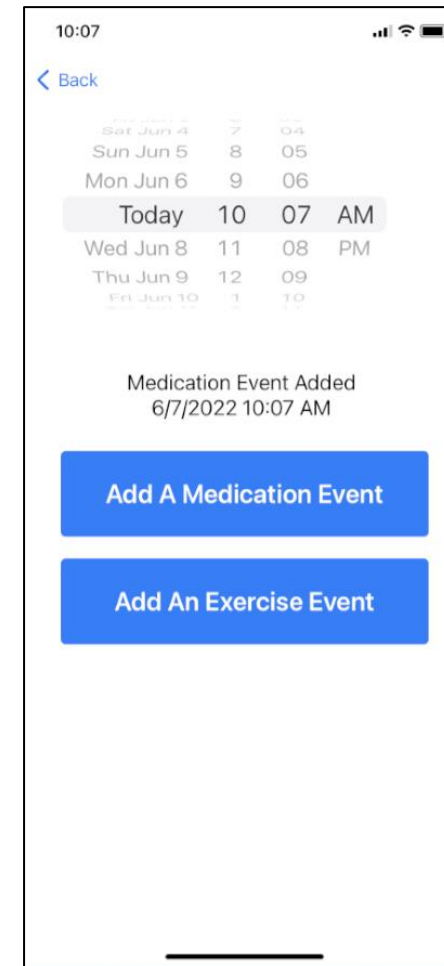
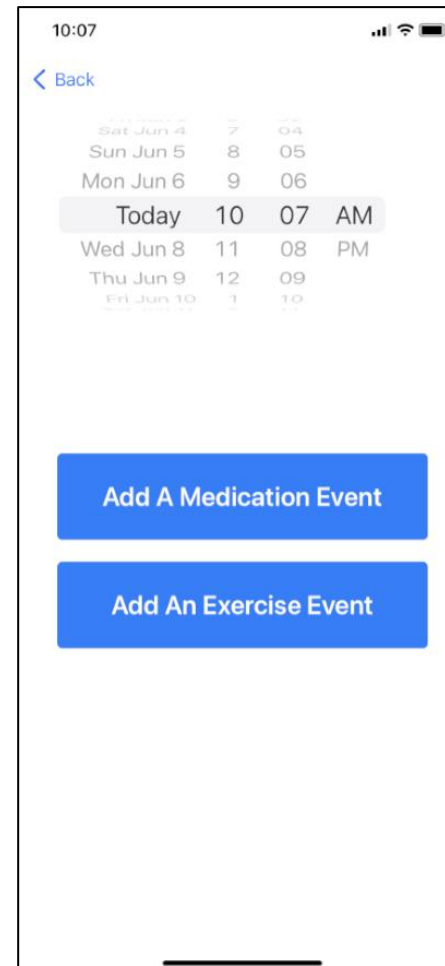
# Customizable Medication Reminders





# KinesiaU: Diaries

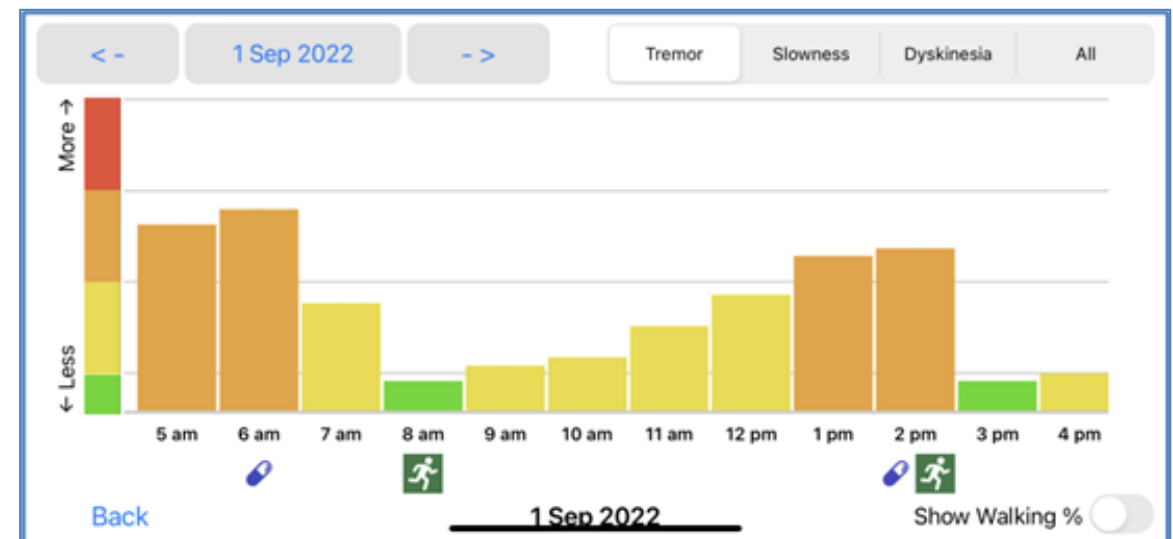
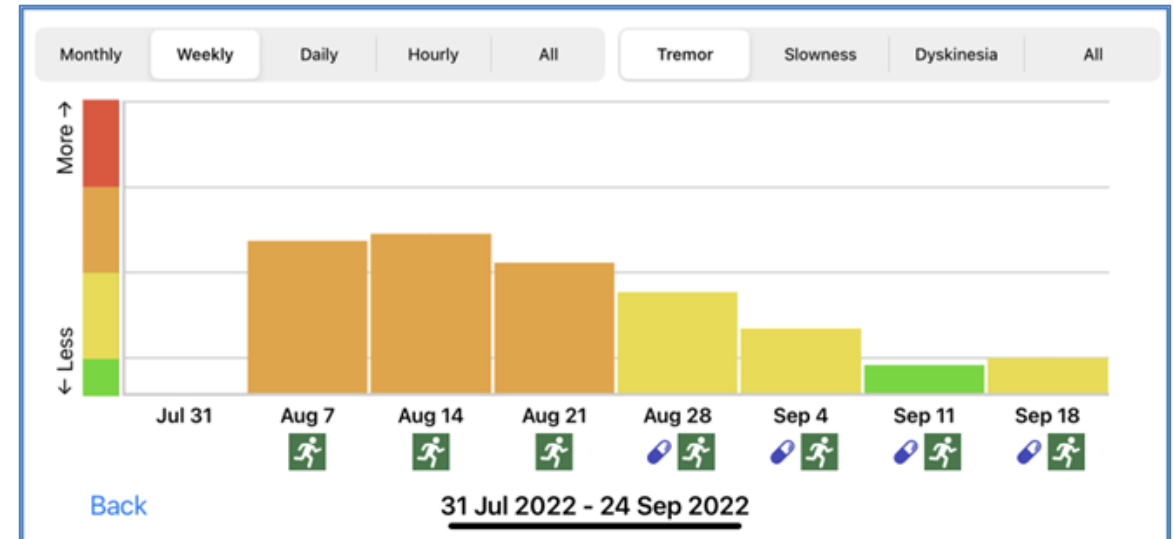
- Using the diary will create a time stamp within the wearable data collected to show when medication was taken or if exercise was completed.
- To add a diary event, tap the “My Diary” button and select the date and time of the event.
- Diary entries can be selected for any past date/time, but cannot be entered for a future time.



# KinesiaU Patient Reports

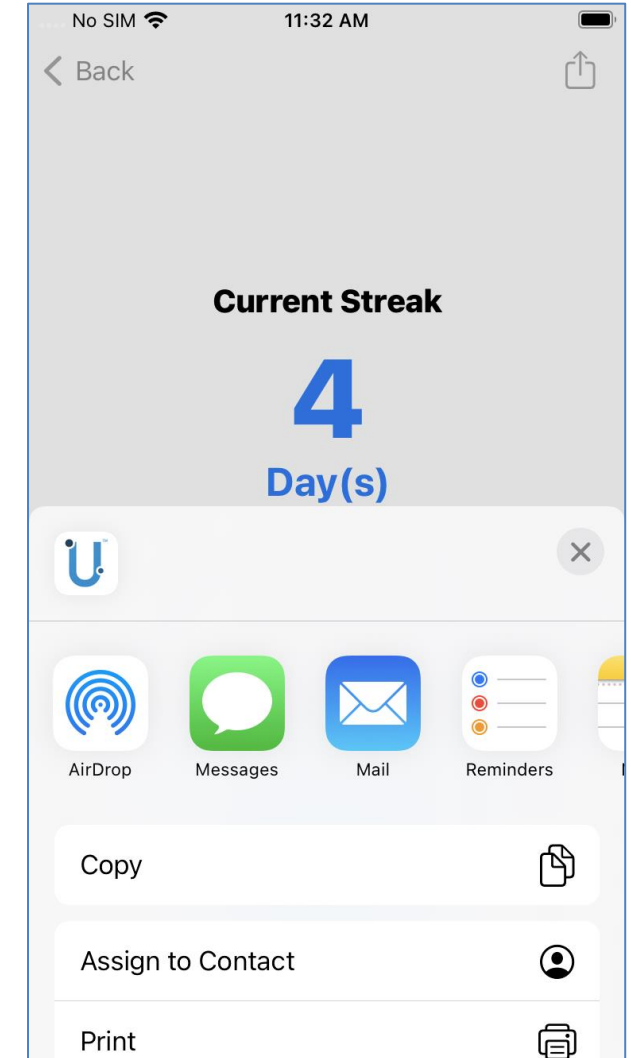
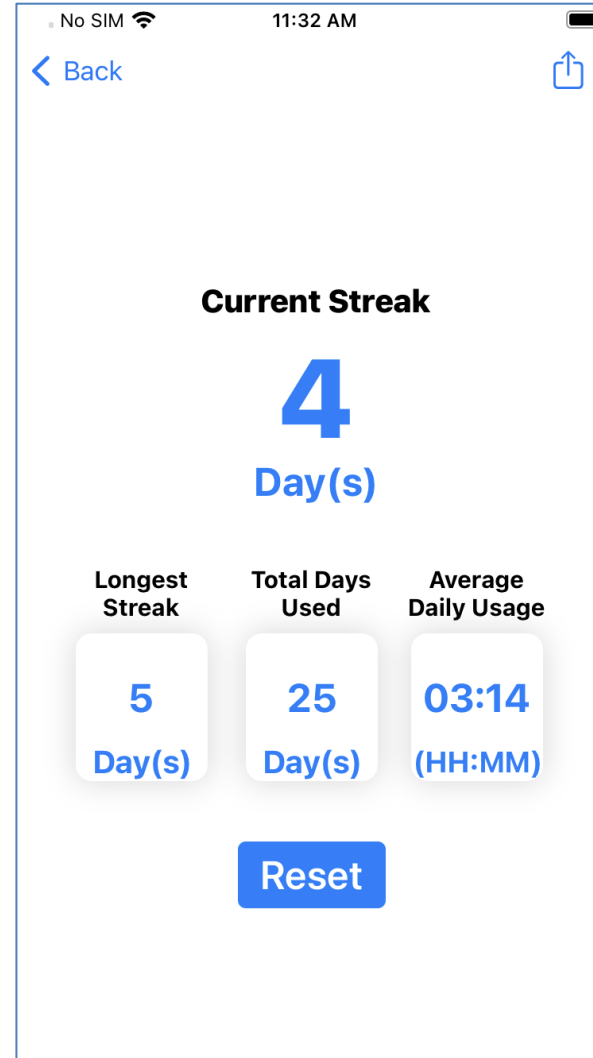
# KinesiaU Patient Reports

- Patients can view their tremor, slowness, and dyskinesia on their phones
- The height and color of the bars represent symptom severity
- The Show Walking % button is used to show the percent of each hour the patient was walking
- The pill and running icons indicate when medication or exercised was entered in the diary



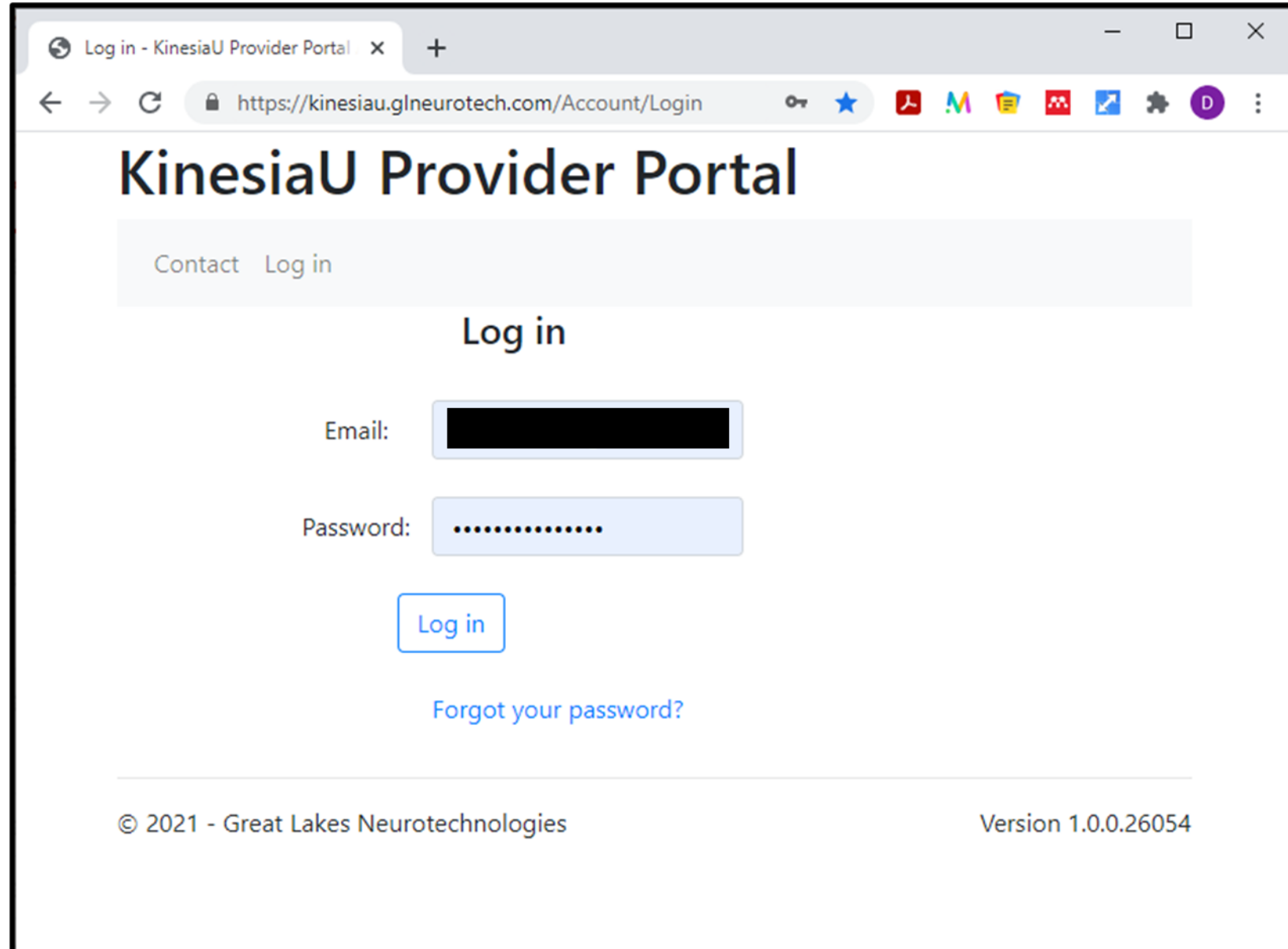
# Usage Report

- Patients can share their usage with their friends or on social media
- Keeps patients engaged



# Provider Portal Overview

# Provider Log in



The screenshot shows a web browser window with the title "Log in - KinesiaU Provider Portal". The address bar displays the URL "https://kinesiau.glneurotech.com/Account/Login". The page content includes the heading "KinesiaU Provider Portal", a navigation bar with "Contact" and "Log in" links, and a central "Log in" section. This section contains an "Email:" label next to a text input field, a "Password:" label next to a password input field, a "Log in" button, and a "Forgot your password?" link. The footer contains the copyright notice "© 2021 - Great Lakes Neurotechnologies" and the version number "Version 1.0.0.26054".

Log in - KinesiaU Provider Portal

https://kinesiau.glneurotech.com/Account/Login

## KinesiaU Provider Portal

Contact Log in

### Log in

Email:

Password:

Log in

[Forgot your password?](#)

© 2021 - Great Lakes Neurotechnologies Version 1.0.0.26054



# Patient List

me/MyPatients

## KinesiaU Provider Portal

Hello [REDACTED] [My Account](#) [Log off](#)

[Home](#) [My Patients](#) [Contact](#)

### My Patients

Find by First or Last Name:

First Name	MI	Last Name	Internal ID	Date Of Birth	Date Added	Email Address	Last Score Uploaded	View Patient
[REDACTED]		[REDACTED]		01/01/1921	02/22/2021	[REDACTED]	01/06/2021	<a href="#">View Patient</a>
[REDACTED]		[REDACTED]		01/01/1921	02/22/2021	[REDACTED]	02/23/2021	<a href="#">View Patient</a>
[REDACTED]		[REDACTED]		06/01/1990	02/22/2021	[REDACTED]	02/18/2021	<a href="#">View Patient</a>
[REDACTED]		[REDACTED]		03/28/1980	01/15/2021	[REDACTED]	02/22/2021	<a href="#">View Patient</a>
[REDACTED]		[REDACTED]		01/01/1921	12/18/2020	[REDACTED]	12/18/2020	<a href="#">View Patient</a>

# Patient Dashboard

Patient:

Patient Profile Patient Dashboard Reports ▾ Notes Log Download Reports ▾

## Patient Dashboard

Date	Sums of Report Type
05/22/2022	<a href="#">Quick Tasks (2)</a> <a href="#">Continuous (10.0 hours)</a>
05/21/2022	<a href="#">Continuous (7.8 hours)</a>
05/20/2022	<a href="#">Continuous (5.0 hours)</a>
05/18/2022	<a href="#">Quick Tasks (2)</a>
05/17/2022	<a href="#">Continuous (13.0 hours)</a>
05/09/2022	<a href="#">Continuous (0.1 hours)</a>
05/06/2022	<a href="#">Continuous (9.1 hours)</a>
05/05/2022	<a href="#">Continuous (14.9 hours)</a>
03/29/2022	<a href="#">Quick Tasks (4)</a>
03/11/2022	<a href="#">Quick Tasks (4)</a>

Continuous links will navigate to the Continuous Report for the associated day. This link shows how many hours the patient recorded that day.

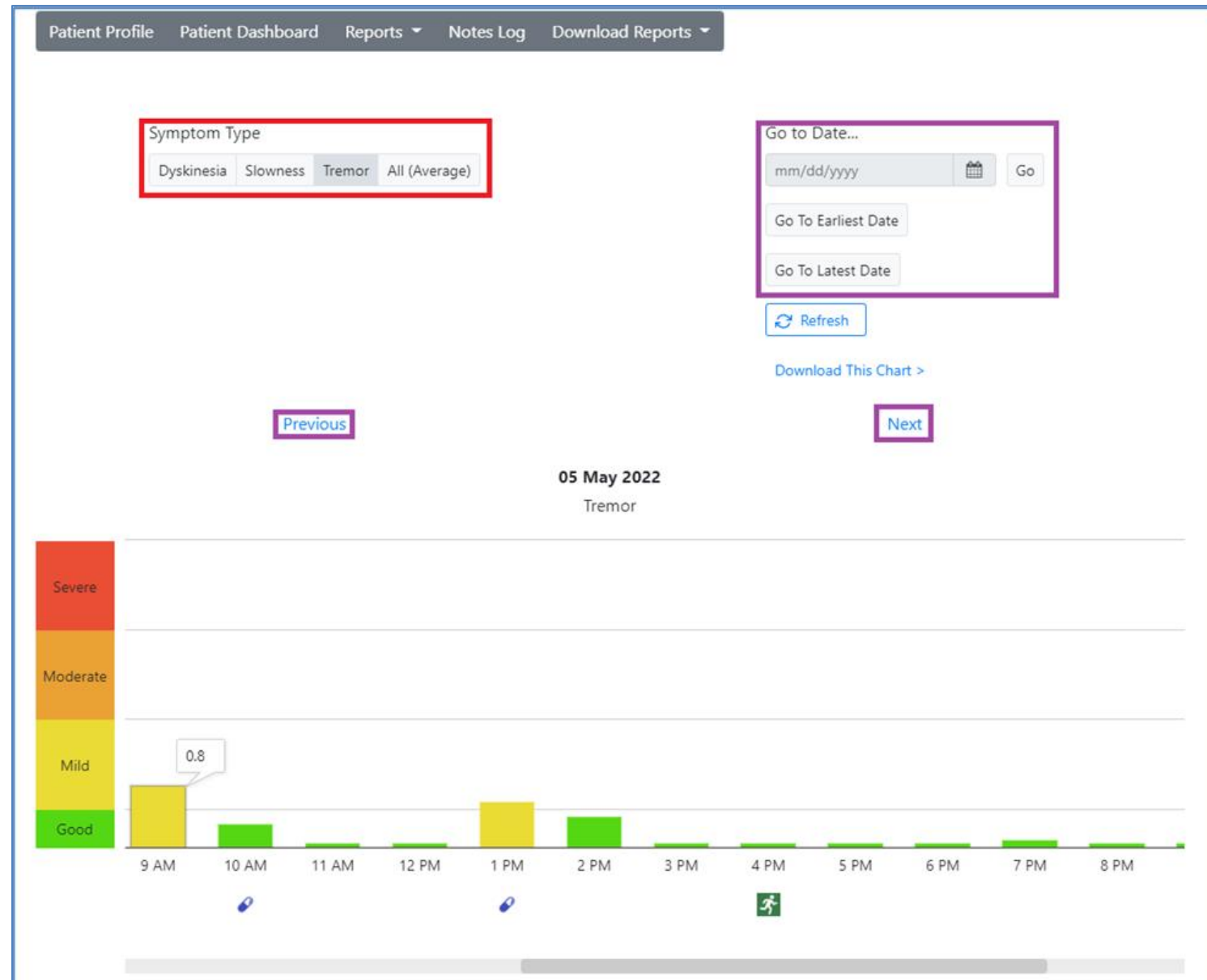
Quick Tasks links will navigate to the Discrete Report for the associated day. This link shows how many Discrete assessments the patient completed that day.

Page 3 of 8

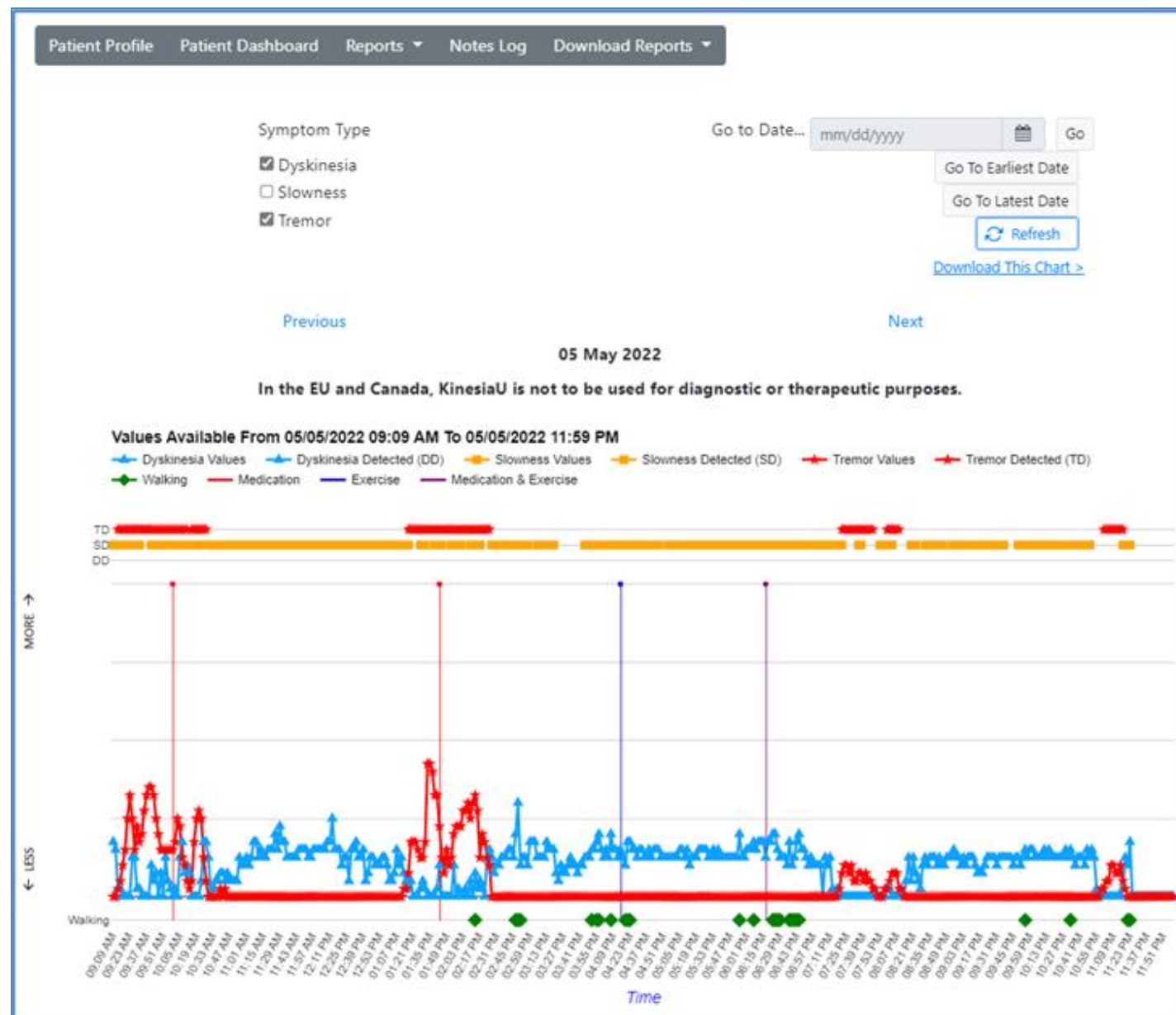
« 1 2 3 4 5 6 7 8 »

View 10 ▾ per page

# Continuous Hourly Report



# Continuous Report



# Real-World Evidence

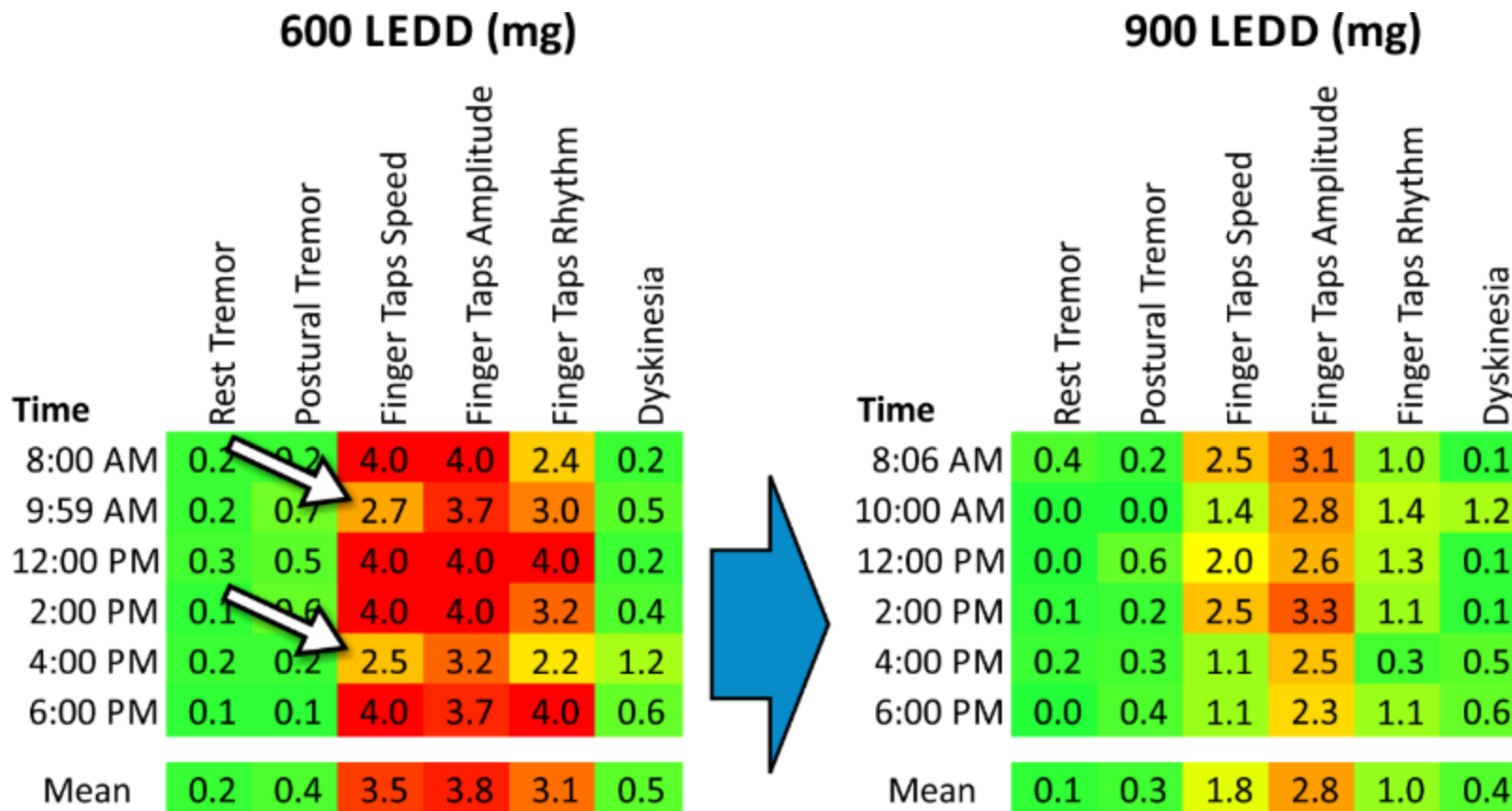
# Kinesia Helps Remotely Titrate Drugs

## Remotely assessed PD patients over 6 months

Patient's result: 51% improvement in motor symptoms



Kinesia report showing PD-related motor impairments through the day, before and after a change in treatment. Kinesia detected improved finger-tapping speed after each dose (arrows), prompting the clinician to escalate therapy. **Bradykinesia was significantly reduced on higher daily levodopa dose (LEDD;  $p < 0.001$ ).**



# Clinical Decision Making

## 12-week study

- 40 patients starting transdermal rotigotine patch
- Patients randomized 1:1 to Control Group or Experimental Group

Control Group	Experimental Group
Standard Care	<ul style="list-style-type: none"><li>• Kinesia 360 at home</li><li>• Patients viewed reports to monitor their progress</li><li>• Clinicians used the data to supplement care</li></ul>

	Control Group	Experimental Group
Starting dosage, mean (SD), mg/24 h	2.0 (0.0)	2.0 (0.0)
Dosage at Week 12, mean (SD)	3.9 (1.7)	4.8 (1.8)
Change in dosage from baseline to Week 12, mean (SD)	+1.9 (1.7)	+2.8 (1.8)
Number of dosage changes, mean (SD)	1.8 (1.2)	2.8 (1.7)

**Kinesia users experienced more dose changes and were titrated to higher doses than those receiving standard care.**

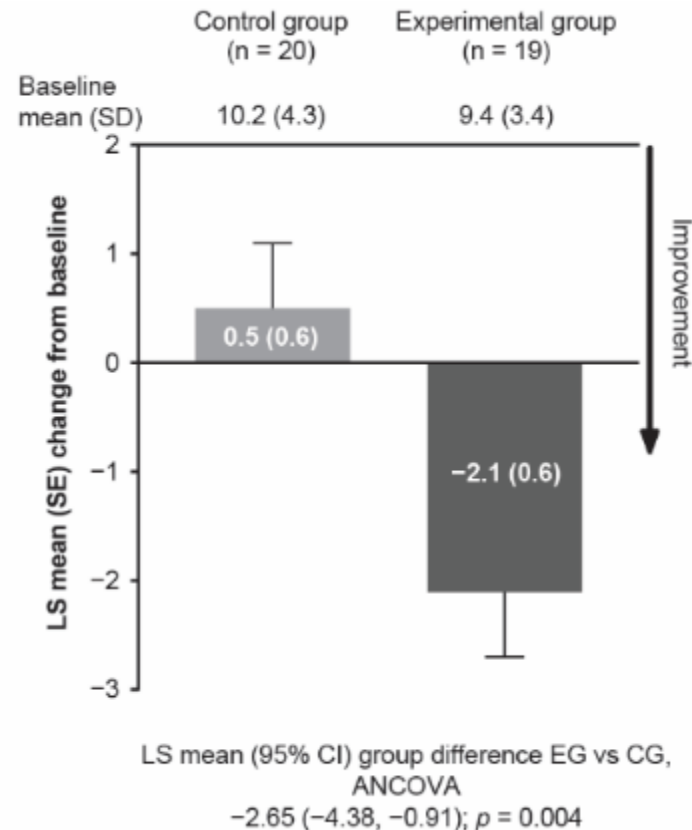
Published

Isaacson S, Boroojerdi B, Waln O, McGraw M, Kreitzman D, Klos K, Revilla F, Heldman D, Phillips M, Terricabras D, Markowitz M, Woltering F, Carson S, Truong D (2019) Effect of using a wearable device on clinical decision-making and motor symptoms in patients with Parkinson's disease starting transdermal rotigotine patch: A pilot study. *Parkinsonism and Related Disorders*.

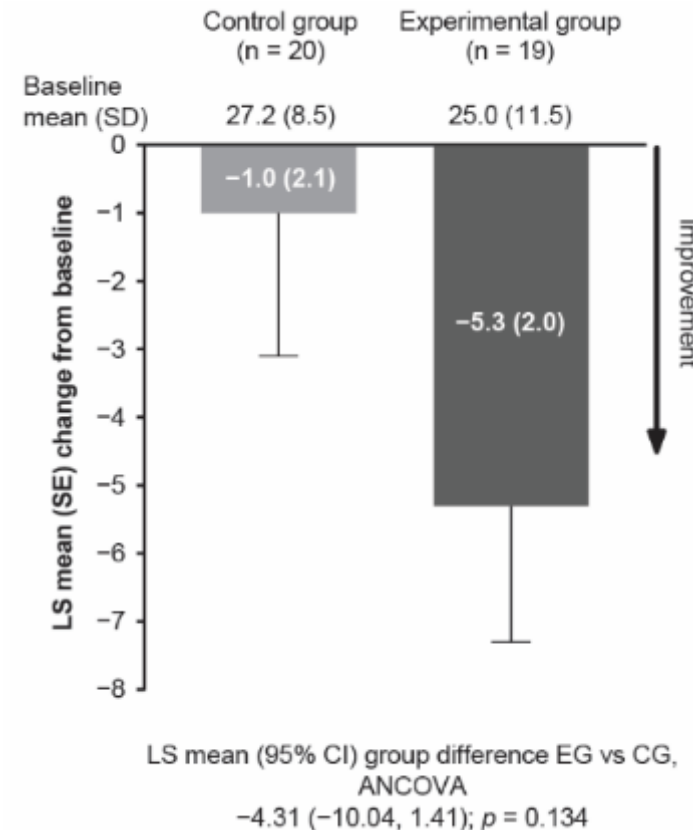


# Clinical Decision Making

## UPDRS-II



## UPDRS-III



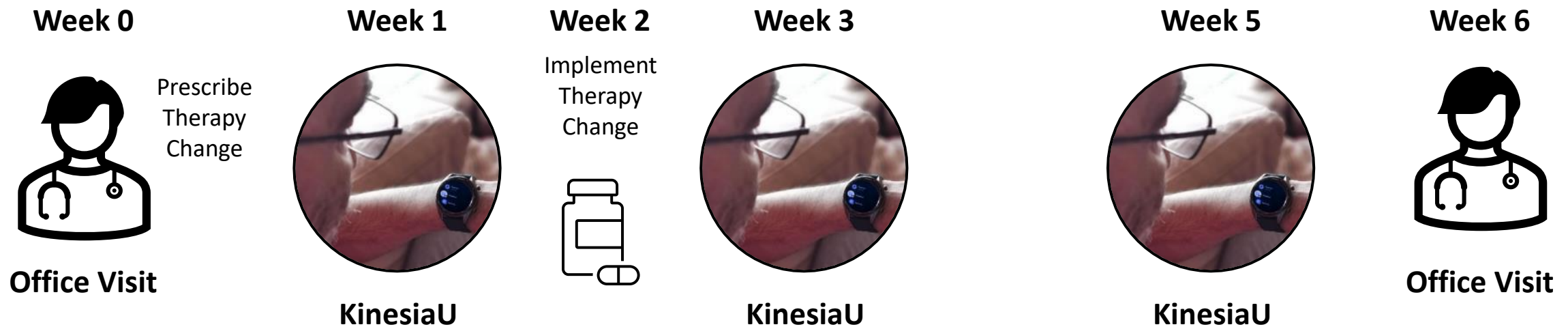
***Kinesia  
significantly  
improved  
patient  
outcomes***

Published

Isaacson S, Boroojerdi B, Waln O, McGraw M, Kreitzman D, Klos K, Revilla F, Heldman D, Phillips M, Terricabras D, Markowitz M, Woltering F, Carson S, Truong D (2019) Effect of using a wearable device on clinical decision-making and motor symptoms in patients with Parkinson's disease starting transdermal rotigotine patch: A pilot study. *Parkinsonism and Related Disorders*.

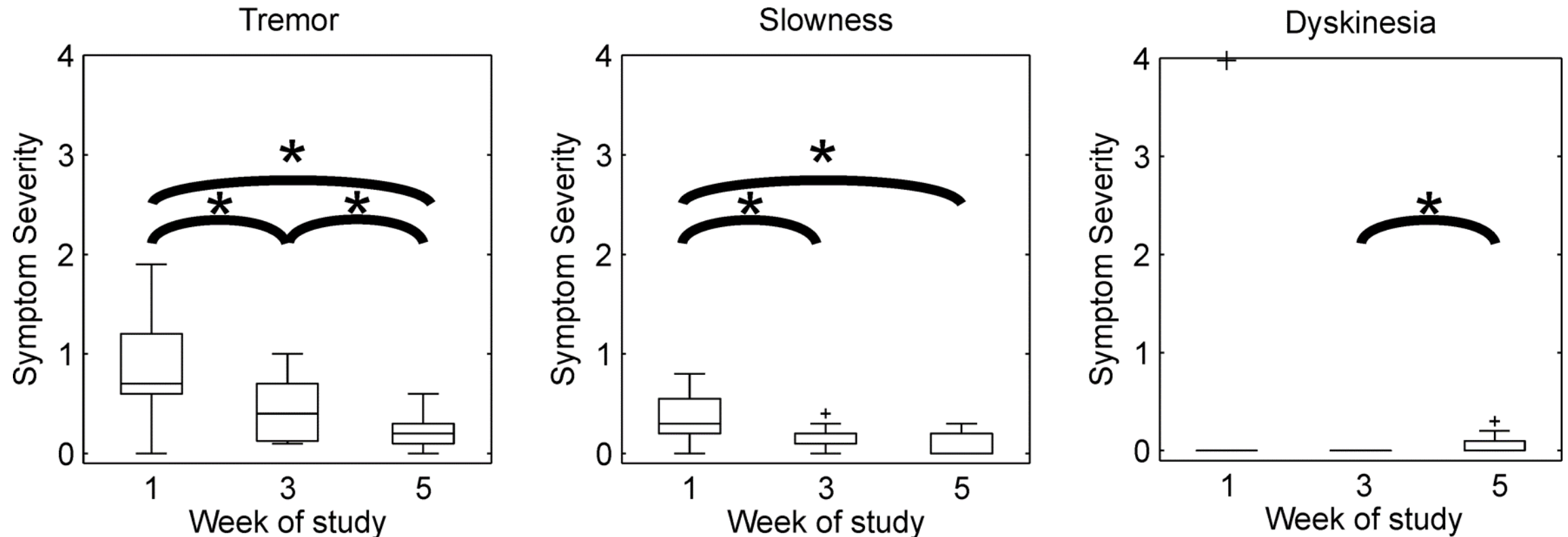
# KinesiaU in Patients Undergoing Therapy Changes

Sixteen patients with PD used KinesiaU before and after a therapy change



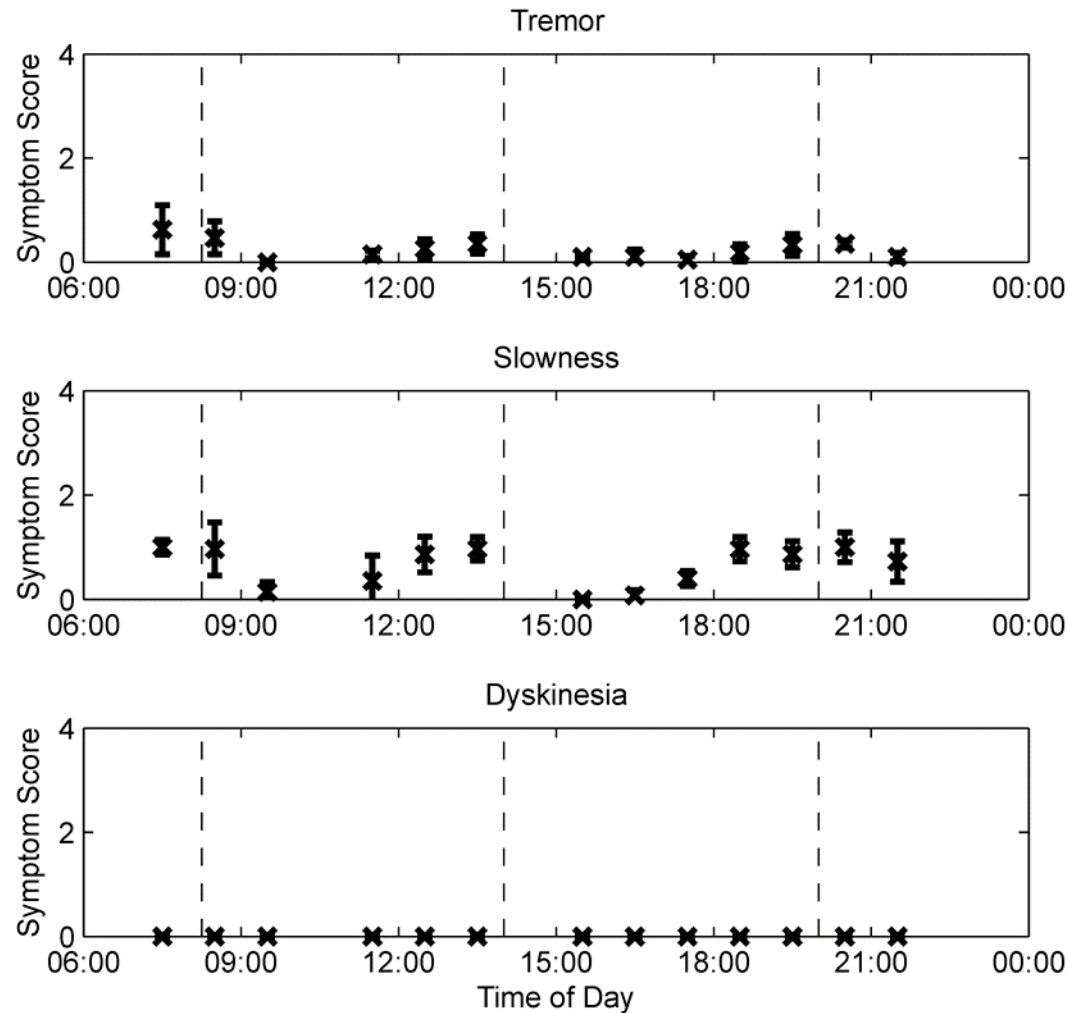
KinesiaU successfully captured intraday fluctuations and short and long-term responses to therapies, including detecting significant improvements ( $p<0.05$ ) in at least one symptom in 7 participants.

# Weekly Response



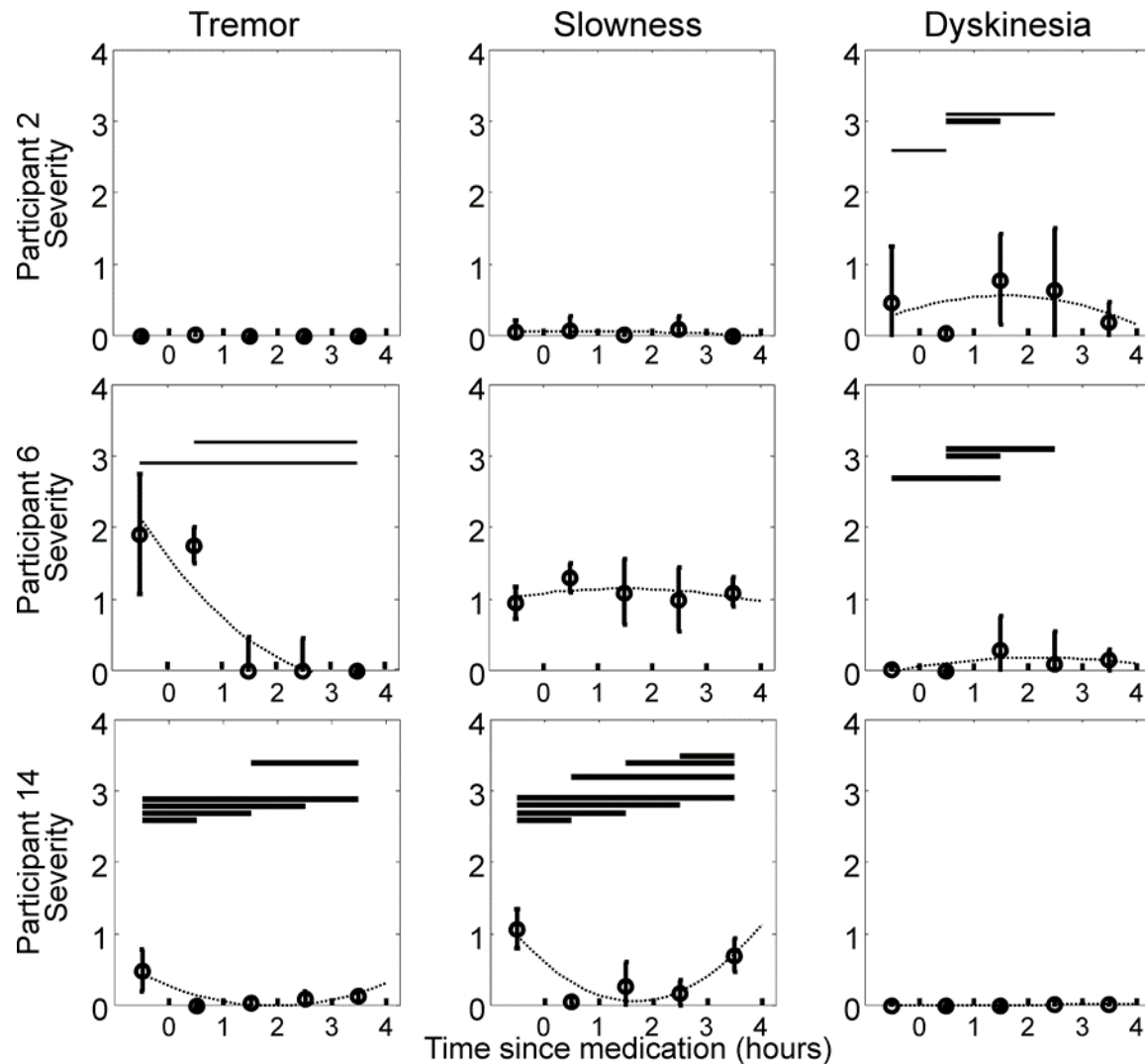
**KinesiaU measured significant ( $p < 0.05$ ) week-to-week changes**

# Intraday Fluctuations



**KinesiaU captured  
intraday fluctuations**

# Dose Response



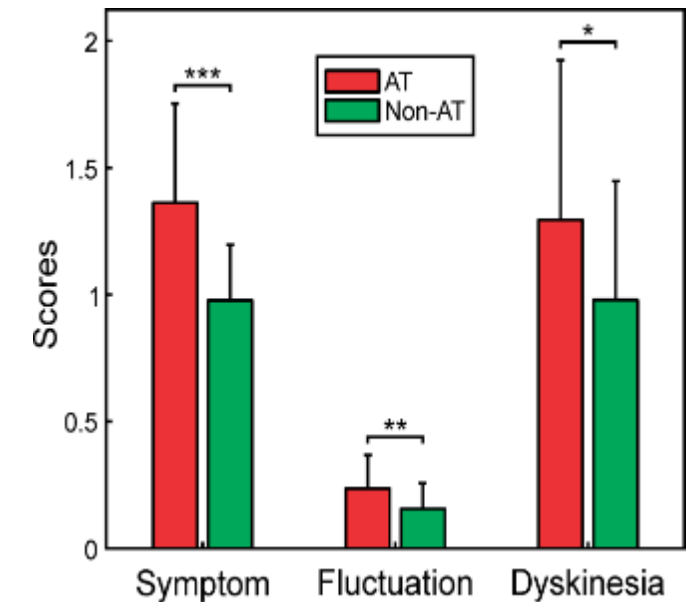
**KinesiaU captured  
medication dose  
response**

# Increased Advanced Therapy Referral

## Characteristics of study participants who were not already on DBS or drug pumps at the study start

	Kinesia (N = 11)	Control (N = 17)	Significant Difference
Age, years	66.73 (7.10)	67.17 (9.51)	
Gender, # male	7 (64%)	9 (53%)	
Levodopa equivalent dose (mg)	1289.3 (877.6)	1315.3 (527.6)	
UPDRS part I	2.36 (1.75)	2.44 (1.54)	
UPDRS part II	13.36 (5.20)	16.33 (6.53)	
UPDRS part III	26.30 (8.94)	33.89 (11.39)	
UPDRS part IV	5.09 (1.51)	6.44 (2.68)	
Recommended for advanced therapy	<b>7 (63.6%)</b>	<b>2 (11.8%)</b>	<b>*</b>
Initiated advanced therapy	<b>4 (36.4%)</b>	<b>0 (0%)</b>	<b>*</b>

**Using Kinesia increased advanced therapy referrals AND advanced therapy implementation**



Kinesia-derived measures differed in those recommend and not recommended for advanced therapy

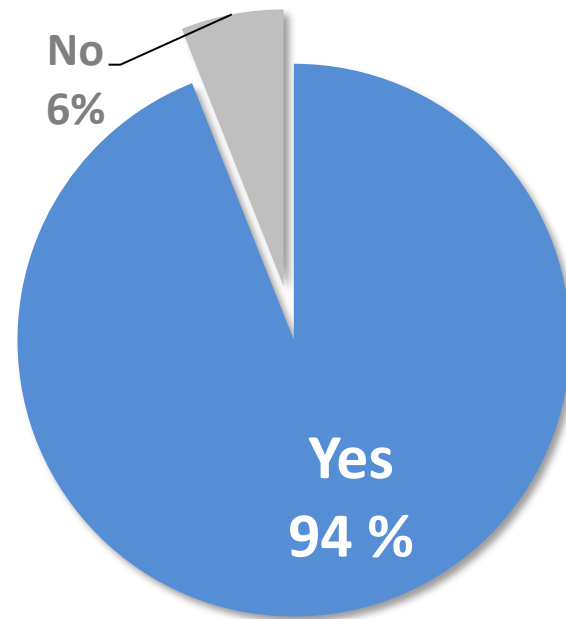
Published

Heldman DA, Giuffrida JP, Cubo E (2016) Wearable Sensors for Advanced Therapy Referral in Parkinson's Disease. *J. Parkinsons. Dis.* 6, 631–638.

# Neurologists Say Kinesia Will Increase Referrals

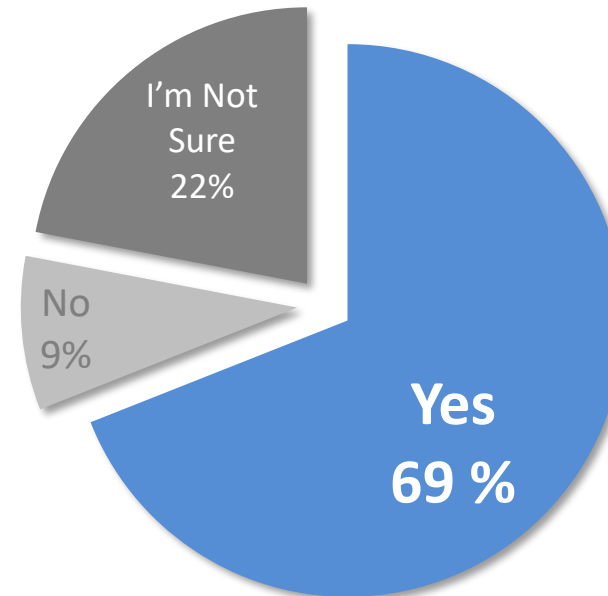
## Independent market research with 32 DBS neurologists

**94%** of neurologists *would recommend Kinesia to their patients* if it were available



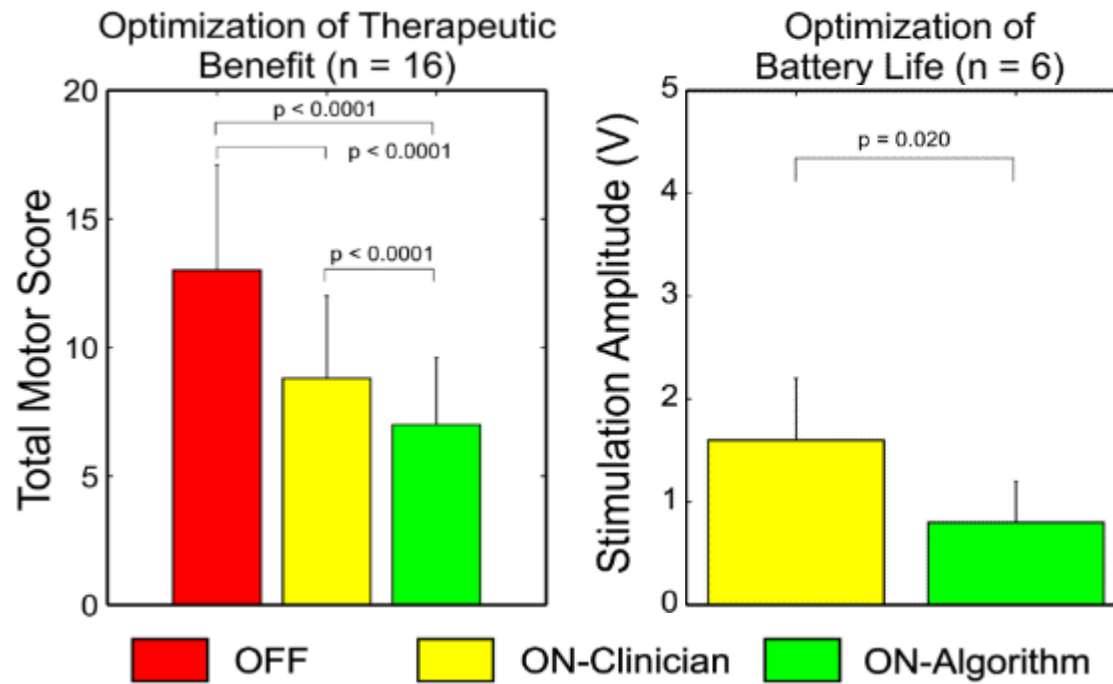
Survey Question: *The technology shown to you is clinically proven, FDA approved and reimbursed. **Would you recommend this technology to your PD patients** if it were available to you and your patients?*

**69%** of neurologists reported that they *would be more likely to recommend a DBS device to their patients* if Kinesia were available to them



Survey Question: *Would you be **more likely to recommend a DBS device** implant to your advanced levodopa-responsive PD patients whose symptoms are not adequately controlled with medication **if the DBS device incorporated wearable objective measurements technology described above?***

# Kinesia Improves Therapeutic Benefit of DBS



“This is a more efficient and effective approach. Patients will make fewer trips for care and in the end we will see reductions in health care costs.”

Jerrold Vitek, M.D., Ph.D., Chair of Neurology at the University of Minnesota<sup>1</sup>

- Kinesia algorithm **improves DBS therapeutic** benefit 42% more than clinician programming
- **Decreases battery usage** by 50% while maintaining therapeutic benefit

Published

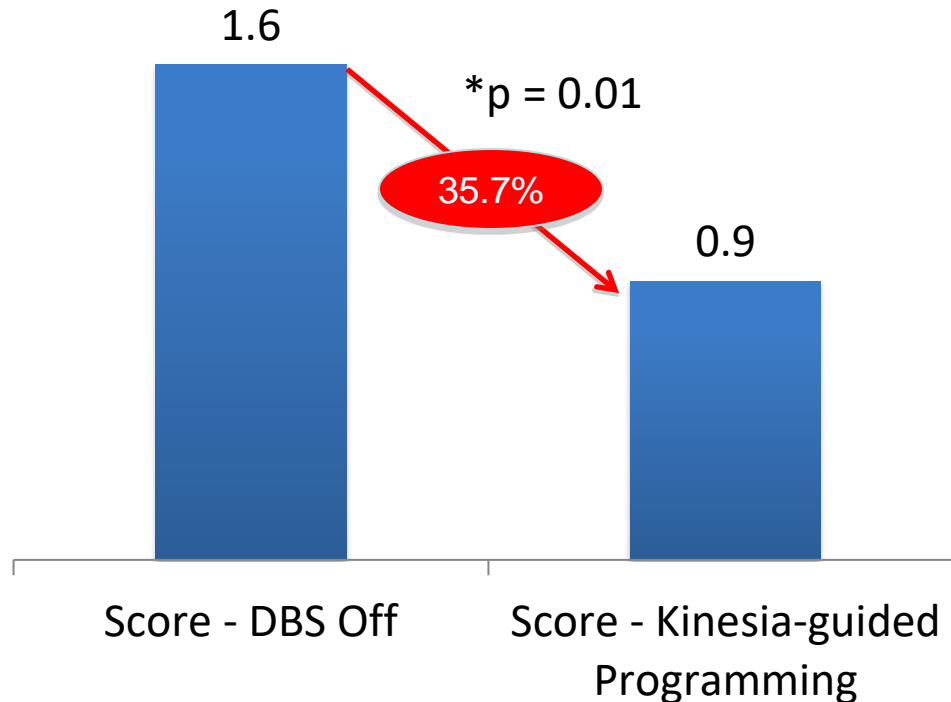
Pulliam, CL, Heldman, DA, Orcutt, TH, Mera, TO, Giuffrida, JP, and Vitek, JL (2015) Motion sensor strategies for automated optimization of deep brain stimulation in Parkinson's disease. *Parkinsonism Relat Disord*. 21(4):378-82.

<sup>1</sup><http://www.healthtalk.umn.edu/2015/03/18/research-snapshot-new-approach-programming-deep-brain-stimulation-parkinsons>



# Real-Time Computer Guided Programming

## Results of 7-patient study



**Symptoms improved by 35.7% when using Kinesia Programming**

- Patients programmed by Kinesia without clinician motor assessment
- Kinesia results comparable to clinician programming

- ✓ Reduces patient management burden:
  - Can be programmed by less experienced clinicians
  - Could help automate programming when integrated with DBS
  - Reduce training and education time for sales reps

Published

Heldman, D.A., Pulliam, C.L., Urrea Mendoza, E., Gartner, M., Giuffrida, J.P., Montgomery, E.B., Espay, A.J., Revilla, F.J. (2016) Computer-Guided Deep Brain Stimulation Programming for Parkinson's Disease. *Neuromodulation: Technology at the Neural Interface*. 19(2):127-32.

# GLNT Publications on Clinical Decision Making

1. Hadley A.J., Riley D.E., Heldman D.A. Real-World Evidence for a Smartwatch-Based Parkinson's Motor Assessment App for Patients Undergoing Therapy Changes. *Digit biomarkers*. 2021 Sep 8;5(3):206–15.
2. Isaacson S, Boroojerdi B, Waln O, McGraw M, Kreitzman D, Klos K, Revilla F, Heldman D.A., Phillips M, Terricabras D, Markowitz M, Woltering F, Carson S, Truong D. Effect of using a wearable device on clinical decision-making and motor symptoms in patients with Parkinson's disease starting transdermal rotigotine patch: A pilot study. *Parkinsonism & Related Disorders*. 2019.
3. Heldman D.A., Harris DA, Felong T, Andrzejewski KL, Dorsey ER, Giuffrida JP, Goldberg B, Burack MA. Telehealth Management of Parkinson's Disease Using Wearable Sensors: An Exploratory Study. *Digit Biomarkers*. 2017;1:43–51.
4. Vittal P, Pulliam CL, Goetz CG, Ouyang B, Jankovic J, Ramirez-Castaneda JL, Heldman, D.A. Does Added Objective Tremor Monitoring Improve Clinical Outcomes In Essential Tremor Treatment? *Mov Disord Clin Pract*. 2017.
5. Heldman, D.A., Giuffrida J.P., Cubo, E. Wearable Sensors for Advanced Therapy Referral in Parkinson's Disease. *J. Parkinsons. Dis*. 2016;6(3):631-638.
6. Heldman, D.A., Pulliam, C.L., Urrea Mendoza, E., Gartner, M., Giuffrida, J.P., Montgomery, E.B., Espay, A.J., Revilla, F.J. Computer-Guided Deep Brain Stimulation Programming for Parkinson's Disease. *Neuromodulation: Technology at the Neural Interface*. 2016;19(2):127-32.
7. Pulliam CL, Heldman D.A., Orcutt TH, Mera TO, Giuffrida JP, Vitek JL. Motion Sensor Strategies for Automated Optimization of Deep Brain Stimulation in Parkinson's disease. *Parkinsonism Relat Disord*. 2015;21(4):378–82.

A complete list of publications can be found at <https://www.glneurotech.com/resources/publications/kinesia-publications/>

# Additional Kinesia Products

# Task Based Assessment

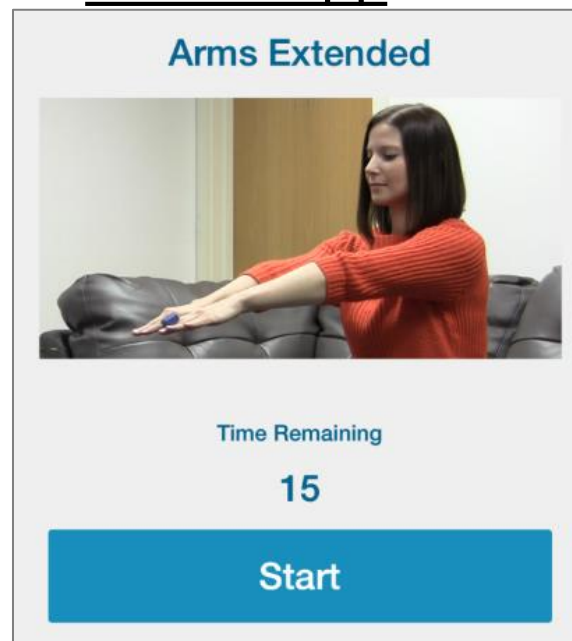


- Symptom assessment based on specific clinically validated tasks performed by patients
- 3 components: sensor, mobile app with patient instructions, and web reports for clinicians
- Proven for assessment of tremor, bradykinesia, dyskinesia, and gait in PD patients

## Objective Sensor



## Mobile App



## Web Portal and Reports

Time	Rest Tremor	Postural Tremor	Finger Taps Speed	Finger Taps Amplitude	Finger Taps Rhythm	Dyskinesia
6:55 AM	3.9	3.4	2.6	2.5	2.3	0.0
6:57 AM	SINEMET (300mg)					
7:28 AM	2.5	3.0	1.7	1.4	1.0	0.0
7:59 AM	0.5	1.9	1.8	1.5	1.2	1.3
8:30 AM	0.3	0.9	0.3	0.5	1.0	2.9
9:05 AM	0.1	0.5	0.2	0.2	1.2	3.5
9:33 AM	0.3	0.4	0.0	0.0	1.0	3.8
10:02 AM	0.5	0.1	0.5	0.3	1.0	3.7
10:31 AM	1.5	2.0	1.0	0.5	1.5	2.9
10:58 AM	3.0	3.1	2.3	2.2	2.0	0.0
11:05 AM	3.4	3.4	2.0	2.0	1.8	0.0

# Continuous Remote Monitoring

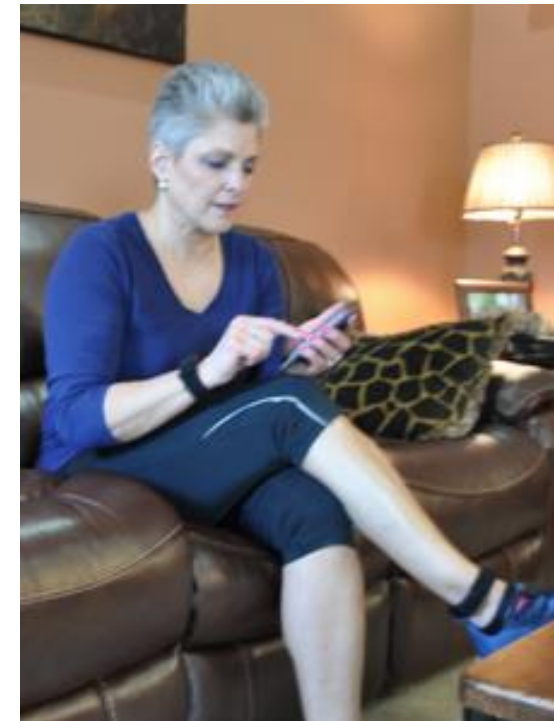


- Hassle-free, passive monitoring system for patients
- Provides motor scores every 2 minutes all day
- Objective measurement of tremor, slowness, dyskinesia and mobility
- Proven to distinguish between true symptoms and symptoms-like daily activities (typing, laundry, etc.)

## Mobile App



## Arm and Leg Sensors



# Preferred Technology for Pharma/Device Mfgs.

## Sample of Companies Using the technology

abbvie



Boston  
Scientific



## Clinical Trials that have used the products as Outcome measures

Study Type	# of studies	# of sites	# of patients
Phase 0/1	15	79	369
Phase 2	15	235	695
Phase 3	1	120	258
Phase 4	4	17	120
Total	35	451	1442

*"I have done research using [the company's] products for many years. It's one of the **easiest** and **also most comprehensive** wearable monitoring systems for motor function available"*

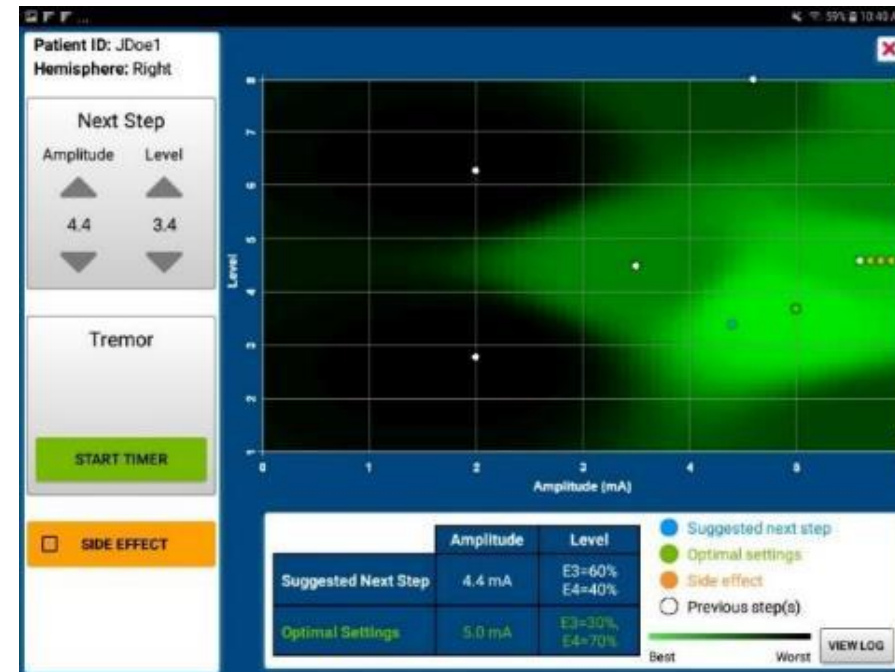
MvD KOL



# Objective DBS Programming



- Wearable objective sensor
- Symptom response visualization maps
- Improves DBS programming efficiency



Kinesia™ is a trademark of Great Lakes NeuroTechnologies Inc.  
StimPoint™ is a trademark of Boston Scientific Corporation.  
Distributed by Boston Scientific Neuromodulation Corporation, Valencia, CA;  
manufactured by Great Lakes NeuroTechnologies Inc., Cleveland, OH.