

GREAT LAKES NEUROTECHNOLOGIES ISSUED PATENT CLAIMS FOR TECHNOLOGY TO ASSESS PARKINSON'S DISEASE

6 JUN 2012: Valley View, OH – Great Lakes NeuroTechnologies announced today that the U.S. Patent Office has issued claims under patent number 8,187,209 covering their Movement Disorder Monitoring System and Method for quantitative assessment of motor symptoms associated with movement disorders. These intellectual property claims will help to protect the significantly growing market segment for their Kinesia technology platforms. The Kinesia™ and Kinesia HomeView™ systems include wireless patient-worn motion sensors to assess tremor, bradykinesia, rigidity, and dyskinesias associated with diseases like Parkinson's and essential tremor. Market applications include both in-clinic and home-based patient care, optimizing programming for deep brain stimulation, and providing quantitative endpoints to determine efficacy of clinical trials. Physicians utilize a web interface to track symptom responses and fluctuations for telemedicine applications.

The issued claims include a portable movement disorder device for measuring severity of a patient's movement disorder symptoms of tremor, bradykinesia, rigidity, or dyskinesia in real-time. The severity of a patient's movement disorder symptoms is calculated based on information from a movement or a biopotential sensor worn by the patient to measure body motion which may also be wirelessly transmitted to a computer or a monitor for processing. Finally, the claims cover the processing of the collected motion data into symptom severity scores and optionally transmitting the information over the Internet for review by clinicians.

For the last decade, the team at Great Lakes NeuroTechnologies has been committed to the development of the [Kinesia](http://www.glneurotech.com/Kinesia/) [http://www.glneurotech.com/Kinesia/] and [Kinesia HomeView](http://www.glneurotech.com/Kinesia-HomeView/) [http://www.glneurotech.com/Kinesia-HomeView/] medical technology platforms. "Great Lakes NeuroTechnologies is now uniquely positioned in the movement disorders market as a global leader in medical device manufacture and commercialization of technologies to standardize, automate, and remotely capture movement disorder patient assessments." says Joseph P. Giuffrida, PhD, President. "Our expertise in technology development and clinical validation is only part of our successful commercialization path. We have also strongly engaged in other critical components of market development including FDA clearance, ISO certification, CE mark, expanded marketing and sales, and now broad claims for intellectual property protection." Dr. Giuffrida also thanked the National Institute of Neurological Disorders and Stroke and the National Institute on Aging for their continued support of these technologies.

As the company's research and development arm is expanding its clinical trials and technology applications, building its intellectual property portfolio remains a priority both domestically and internationally. Brian Kolkowski, PhD, Executive Vice-President and General Counsel stated "The broad claims that were awarded with this initial patent should provide a significant competitive advantage in the growing movement disorder diagnostics and therapy market. The portable movement disorder system claims also include administering a drug from a reservoir based on the calculated severity of the

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subject's movement disorder. The awarded claims provide a strong intellectual property foundation on which our other submitted patent applications and international filings should continue to build.”

About Great Lakes NeuroTechnologies

[Great Lakes NeuroTechnologies](http://www.glneurotech.com) [http://www.glneurotech.com] is committed to pioneering innovative biomedical technologies to serve research, education, and medical communities, improving access to medical technology for diverse populations, and positively impacting quality of life for people around the world.

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Giuffrida

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(54) **MOVEMENT DISORDER MONITORING SYSTEM AND METHOD**

OTHER PUBLICATIONS

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 2142 days.

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(52) **U.S. Cl.** **600/595**

(58) **Field of Classification Search** **600/595**
See application file for complete search history.

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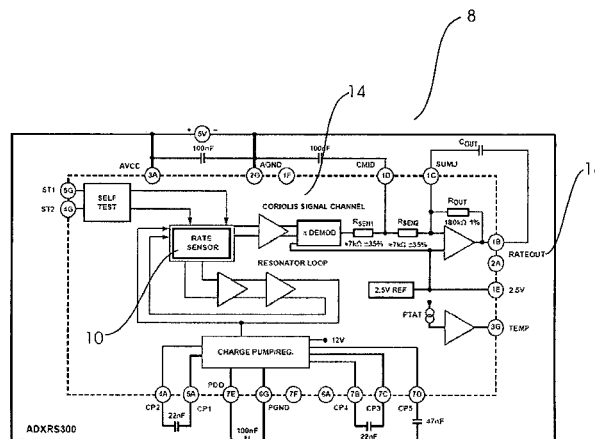
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(57) **ABSTRACT**

The present invention relates to a movement disorder monitor, and a method of measuring the severity of a subject's movement disorder. The present invention additionally relates to a drug delivery system for dosing a subject in response to the increased severity of a subject's symptoms. The present invention provides for a system and method, which can accurately quantify symptoms of movements disorders, accurately quantifies symptoms utilizing both kinetic information and electromyography (EMG) data, that can be worn continuously to provide continuous information to be analyzed as needed by the clinician, that can provide analysis in real-time, that allows for home monitoring of symptoms in subject's with these movement disorders to capture the complex fluctuation patterns of the disease over the course of days, weeks or months, that maximizes subject safety, and that provides remote access to the clinician or physician.

20 Claims, 14 Drawing Sheets



What is claimed:

1. A portable movement disorder device for measuring severity of a subject's movement disorder having symptoms comprising one or more of tremor, bradykinesia, rigidity, or dyskinesia, the device comprising

a first sensor for measuring a subject's external body motion having a signal related to the subject's external body motion; and
a second sensor for measuring a subject's electrical muscle activity having a signal related to the subject's electrical muscle activity
wherein the severity of the subject's tremor, bradykinesia, rigidity, or dyskinesia is calculated based in part on the signals of the first and second sensors.

2. The portable movement disorder device in Claim 1, wherein the first sensor comprises an accelerometer.

3. The portable movement disorder device in Claim 1, wherein the first sensor comprises at least one accelerometer and at least one gyroscope.

4. The portable movement disorder device in Claim 1, wherein the first sensor is attached to one of the subject's extremities.

5. The portable movement disorder device in Claim 1, wherein the second sensor is a dry electrode.

6. The portable movement disorder device in Claim 1, wherein the device weighs less than 2 lbs.

7. A method of measuring severity of a subject's movement disorder having symptoms comprising one or more of tremor, bradykinesia, rigidity, or dyskinesia, the method comprising the steps of:

measuring with a first device the external body motion of a subject who is believed to have a movement disorder in order to determine a severity of the subject's movement disorder;
transmitting a radio frequency signal from the first device worn by a subject based in part on the subject's measured external body motion;
receiving the radio frequency transmitted signal with a second device; and
scoring the severity of a subject's tremor, bradykinesia, rigidity, or dyskinesia based in part on the radio frequency transmitted signal.

8. The method in Claim 7, further comprising a step of re-transmitting the radio frequency signal or transmitting the score based on the radio frequency score over the internet.

9. The method in Claim 7, further comprising a step of re-transmitting the radio frequency signal or

transmitting the score based on the radio frequency score over telephone lines.

10. The method in Claim 8, further comprising a step of having a clinician review the radio frequency signal or score that has been transmitted over the internet.

11. The method in Claim 9, further comprising a step of having a clinician review the radio frequency signal or score that has been transmitted over the telephone lines.

12. The method in Claim 7, wherein the second device is a PDA.

13. The method in Claim 7, wherein the second device is a computer.

14. A portable movement disorder device or system for measuring severity of a subject's movement disorder having symptoms comprising one or more of tremor, bradykinesia, rigidity, or dyskinesia, the device or system comprising

at least one external sensor having a signal for measuring a subject's external body motion or physiological signal associated with a movement disorder; and

at least one processor for receiving the signal and calculating the severity of the subject's tremor, bradykinesia, rigidity, or dyskinesia in real time.

15. The portable movement disorder system in Claim 14, wherein the system weighs less than about 15 lbs.

16. The portable movement disorder system in Claim 14, further comprising a drug reservoir, wherein a drug in the drug reservoir is administered to the subject based in part on the severity of the subject's movement disorder.

17. The portable movement disorder system in Claim 16, further comprising a closed loop control system wherein the drug administration is controlled in part by the closed loop control system.

18. The portable movement disorder system in Claim 14, wherein the severity of the subject's movement disorder is calculated in less than 30 seconds.

19. The portable movement disorder system in Claim 14, wherein the severity of the subject's movement disorder is calculated in less than 1 second.

20. The portable movement disorder system in Claim 14, wherein the severity of the subject's movement disorder is calculated in less than 0.1 seconds.