

New imaging test gives physicians better tool to diagnose Parkinson's disease

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Thanks to a new diagnostic imaging technique, physicians now have an objective test to evaluate patients for parkinsonian syndromes, such as Parkinson's disease. Northwestern Memorial Hospital is among the first institutions in the country to offer DaTscan™, the only FDA-approved imaging agent for assessment of movement disorders. Until now, there were no definitive tests to identify the disease, forcing physicians to rely on clinical examinations to make a diagnosis. This technology allows doctors to differentiate Parkinson's from other movement disorders.

"The scan by itself does not make the diagnosis of Parkinson's but it allows us to identify patients who have loss of [dopamine](#), the major chemical responsible for the symptoms, from those who have no dopamine deficiency," said Tanya Simuni, MD, a neurologist at Northwestern Memorial and director of Northwestern's [Parkinson's Disease](#) and Movement Disorders Center. "This is a very important step in being able to accurately identify and treat movement disorders and hopefully allow us to better understand these diseases over time."

Parkinson's disease is a neurodegenerative disorder that afflicts nearly 1.5 million Americans, with an additional 50,000 to 60,000 new cases identified each year. People with Parkinson's lack dopamine in the brain, which leads to tremor, slowness of movement, muscle stiffness and balance problems. Clinical examinations, particularly early in the disease when symptoms are slight, can be inconclusive or lead to misdiagnosis of another movement disorder, such as essential tremor, which share similar symptoms to Parkinson's, but require different treatment.

Developed by GE Healthcare, DaTscan is a substance used to detect the presence of dopamine transporters (DaT) in the brain. A patient is injected with the contrast agent and then undergoes a single-photon emission computed tomography (SPECT) scan. The test captures detailed pictures of the brain's dopamine system and can provide visual evidence of the presence of dopamine transporters. Scans of patients with Parkinson's disease or another parkinsonian syndrome will show very low dopamine levels. A SPECT scan examines brain function, rather than structure, and can show change in the brain's chemistry.

"In Parkinson's patients the brain's anatomy remains largely normal, unlike other conditions such as stroke, where damage to the brain is visible," explained Simuni, who is also an associate professor of neurology at Northwestern University Feinberg School of Medicine. "DaTscan attaches to dopamine neurons which illuminate on the SPECT scan; the more light areas that exist, the more healthy dopamine brain cells remain. If the areas of the brain that should show dopamine remain dark, it may indicate the patient has some type of parkinsonian syndrome."

An accurate clinical diagnosis for patients with neurodegenerative movement disorders, such as Parkinson's, can take up to six years. While symptoms often mimic Parkinson's, other movement disorders, such as essential tremor, occur in different areas of the brain and do not involve the dopamine system.

"Even though they may appear similar, other movement disorders require different management. DaTscan allows us to confirm our diagnosis earlier and start the correct course of treatment sooner," said Simuni. "We are hopeful that this will lead to improved quality of life for these patients with better long term outcomes, as well as protection from unnecessary treatments initiated because of misdiagnosis."

While Simuni does not believe it is necessary for every patient to confirm their Parkinson's diagnosis with DaTscan, she does see it as a valuable tool for patients with uncertain syndromes, or those who have not responded to treatment. She also sees it as a means for improving Parkinson's research by ensuring those enrolled in studies actually have the disease. DaTscan is already being used by the Michael J. Fox Foundation for its landmark biomarkers study, the Parkinson's Progression Markers Initiative (PPMI), to validate that the subjects have Parkinson's disease. Northwestern is one of the 14 U.S. medical centers enrolling for the PPMI, which is among the first clinical trials using DaTscan in this way.

"Currently, we are not able to say with certainty that those enrolled in Parkinson's studies have the disease," said Simuni. "With the addition of DaTscan, we can be much more confident in the status of research subjects in both the control and experimental groups. By having a better understanding of these populations, we should be able to have clearer outcomes and hopefully that will translate sooner into treatments and eventually a cure."

Researchers are also hopeful that DaTscan will prove to be useful in following the progression of Parkinson's throughout a patient's lifetime. "The disease is clinically measured at certain points of time to help physicians understand its development," said Simuni. "A lot of questions about how Parkinson's disease progresses can be answered if DaTscan is able to show us changes in the brain's chemistry over time."

Provided by Northwestern Memorial Hospital

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