

Irregular arm swing may point to Parkinson's disease

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Irregular arm swings while walking could be an early sign of Parkinson's disease, according to neurologists who believe early detection may help physicians apply treatments to slow further brain cell damage until strategies to slow disease progression are available.

Parkinson's disease is an age-related disorder involving loss of certain types of [brain cells](#) and marked by impaired movement and slow speech.

"The disease is currently diagnosed by tremors at rest and stiffness in the body and limbs," said Xuemei Huang, associate professor of neurology, Penn State Hershey College of Medicine. "But by the time we diagnose the disease, about 50 to 80 percent of the critical cells called dopamine neurons are already dead."

Huang and her colleagues are studying gait, or the manner in which people walk, to understand the physical signs that might be a very early marker for the onset of Parkinson's. They have confirmed Huang's clinical impression that in people with Parkinson's, the arm swing is asymmetrical. In other words, one arm swings much less than the other as a person walks.

"We know that Parkinson's patients lose their arm swing even very early in the disease but nobody had looked using a scientifically measured approach to see if the loss was asymmetrical or when this asymmetry first showed up," said Huang. Her team's findings appear in the current issue of *Gait and Posture*. "Our [hypothesis](#) is that because Parkinson's is

an asymmetrical disease, the arm swing on one arm will be lost first compared to the other."

The researchers compared the arm swing of 12 people diagnosed three years earlier with Parkinson's, to eight people in a control group. The Parkinson's patients were asked to stop all medication the night before to avoid influencing the test results.

The team used special equipment to measure movement accurately, including many reflective markers on the study participants and eight digital cameras that captured the exact position of each segment of the body during a walk.

"Images from the cameras were sent to a computer where special software analyzed the data" explained Huang. "When a person walks, the computer was able to calculate the degree of swing of each arm with millimeter accuracy."

Analysis of the magnitude of arm swing, asymmetry and walking speed revealed that the arm swing of people with Parkinson's has remarkably greater asymmetry than people in the control group -- one arm swung significantly less than the other in the Parkinson's patients.

When the participants walked at a faster speed, the arm swing increased but the corresponding asymmetry between them remained the same.

"We believe this is the first demonstration that asymmetrical arm swings may be a very early sign of the disease," said Huang.

While slightly irregular arm swing occurs in people without Parkinson's, the asymmetry is significantly larger in those suffering from the disease.

"Our data suggests that this could be a very useful tool for the early

detection of Parkinson's," noted Huang. "There are wide scale efforts to find drugs that slow cell death. When they are found, they could be used in conjunction with this technique to arrest or perhaps cure the disease because they could be given before great damage has occurred."

Source: Pennsylvania State University ([news](#) : [web](#))

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