

# A better way to track your every move

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Physical activity tracking apps on smartphones are a potentially important tool for doctors who want to collect data and create treatment or intervention plans to improve the health of patients who struggle with activity and movement—such as those with Parkinson's disease.

A new Northwestern Medicine study has found a way to make these apps more accurate—no matter where patients carry their phones. The study was recently published online in the *Journal of Neuroscience Methods*.

Previous studies of activity tracker apps have found that patients generally carry their phone in a pocket, on a belt or in a purse or bag throughout the day and are not aware that where they carry their phone can impact how well the tracker works.

Designed with fashion and comfort in mind, a new algorithm—developed by an interdisciplinary team at Northwestern—can be used with a [physical activity](#) app to predict the location of a phone throughout the day with near perfect accuracy.

"While it remains true that smartphone activity trackers are the most accurate when the phone is placed in the pocket or on a belt, with this algorithm we can provide an estimate of error associated with other locations where the phone is carried," said Konrad Kording, principal investigator of the study.

Kording is an associate professor of physical medicine and rehabilitation

and of physiology at Northwestern University Feinberg School of Medicine and a research scientist at the Rehabilitation Institute of Chicago.

This finding is important because studies have shown that in everyday life people carry their phones in different ways. It is unrealistic to expect all patients with activity tracker apps to always carry their phone in their pocket or on a belt, Kording said.

"Most women carry their phones in a purse," said Stephen Antos, first author of the study. "Some people carry theirs on their belt or in their hand. We may change where we carry our phone throughout the day as well. We wanted to solve this problem and find a way to make these trackers as accurate as possible no matter where you carry your phone."

Antos is a PhD candidate in the department of biomedical engineering at Northwestern University's McCormick School of Engineering and Applied Science and a research scientist in the Sensory Motor Performance Program, Rehabilitation Institute of Chicago.

For the study, a team of interdisciplinary researchers from Feinberg's Center for Behavioral Intervention Technologies recruited twelve healthy subjects to take on pre-arranged activities such as walking, sitting and standing while carrying a [smartphone](#) in different places (purse/backpack, belt, hand and pocket.) The same method was used on two people with Parkinson's disease.

The data was used to train a computer algorithm to predict where a phone is being carried and to detect second-by-second activity such as sitting, standing and walking.

This study is one of many taking place at Northwestern's Center for Behavioral Intervention Technologies that uses smart [phone](#) apps to

improve health. Kording believes that in the near future smartphones will have a major role in how we manage our health.

"I believe we will have apps running on smartphones that will know exactly what we're doing activity-wise and will warn us of diseases before we even know that we have those diseases," Kording said. "In the future, phones will have a major role in motivating people towards behavior that is good for their health."

Provided by Northwestern University

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