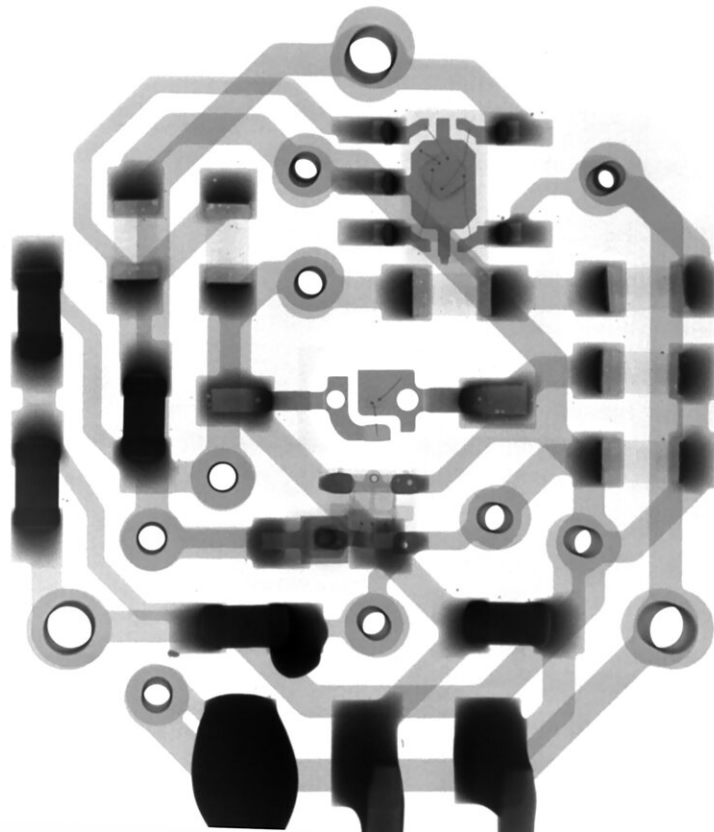


Wearable biosensors can help people with complex health conditions

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Remote monitoring of health-related behavior with wearable sensor technology is feasible for people with complex health conditions, shows a recent University of Waterloo study.

"Information from wearables can provide insight into patterns of health-related behavior and disease symptoms as they occur over days and weeks. This may be important for monitoring disease progression and the impact of therapeutics, supplementary to assessments conducted in the clinic," said Karen Van Ooteghem, a researcher in Kinesiology and Health Sciences at Waterloo. "Within our research program, we carry out work to validate novel outcomes derived from wearables for these purposes and develop avenues to relay this information to patients and clinicians."

It was important for researchers to understand feasibility in participants' natural environments because behavior in the lab or clinic may not reflect what occurs in day-to-day living, Van Ooteghem said.

The researchers recruited 39 participants with cerebrovascular or [neurodegenerative diseases](#) to wear up to five devices on their ankles, wrists and chest continuously for seven days at home and in the community following a clinic visit. For people living with complex health conditions, there are advantages to using multiple sensors to capture specific behaviors and symptoms, for example, upper versus lower limb impairment. Participants wore at least three devices for a median of 98 percent of the study period. They also enrolled with a study partner who could help them navigate any issues that arose during the study.

Beth Godkin, a Waterloo Kinesiology and Health Sciences doctoral student and first author on the paper, said the willingness to wear the technology might have been influenced by the support offered to participants during the study. Through interviews with participants and study partners, researchers also learned that there is still room for improvement when it comes to the technology itself that could enhance the user experience.

"Participants felt it was important to optimize comfort, ease of use and appearance if they needed to wear sensors for long periods and felt that continued effort should be made to ensure the technology does not interfere with activities of daily living," Godkin said. "The generally positive response from participants and willingness to engage in multi-sensor wear over an extended period is the necessary first step towards meaningful integration of our approach in larger research studies and eventually, for uptake within clinical care."

The study, Feasibility of a continuous, multi-sensor remote [health monitoring approach in persons living with neurodegenerative disease](#), co-authored by Godkin, Van Ooteghem and others at Waterloo, alongside other investigators within the Ontario Neurodegenerative Disease Research Initiative, was published in *Journal of Neurology*.

More information: F. Elizabeth Godkin et al, Feasibility of a continuous, multi-sensor remote health monitoring approach in persons living with neurodegenerative disease, *Journal of Neurology* (2021). [DOI: 10.1007/s00415-021-10831-z](https://doi.org/10.1007/s00415-021-10831-z)

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