The Graduate School of Biomedical Sciences
MD|PhD Program in Biomedical Sciences

Announces the PhD Thesis Defense of

ERIC DING

Feasibility of Smartwatch-Based Atrial Fibrillation Detection Among Older Adults After Stroke

Wednesday, July 28, 2021 at 4 p.m. Via Zoom Meeting

Atrial fibrillation (AF) confers high risk of stroke, but often goes undiagnosed due to difficulties in its diagnosis. AF detection is important in post-stroke populations for secondary prevention and smartwatches have emerged as a promising modality for detecting AF, but little is known about their use in older adults who have experienced a stroke. This dissertation used data from the Pulsewatch study, a two-phased randomized controlled trial assessing accuracy, usability, and adherence of smartwatch-based AF detection among older patients after stroke. Analyses performed include: descriptive statistics, linear and logistic regressions, qualitative and mixed-methods analyses, mixed effects modeling, and group-based trajectory modeling. The Pulsewatch system was highly accurate in detecting AF compared to a clinical gold-standard. Participants found the system easy to use, but indicated that streamlining the smartwatch's functionalities to focus on passive cardiac monitoring is crucial. Improving battery life to allow for longer wear time would alleviate anxiety in some participants. Participants with previous experience using cardiac rhythm monitors rated the system lower on usability, but overwhelmingly preferred it to previous monitors due to the watch's comfort, appearance, and convenience. Watch wear decreased over time, though we observed three distinct patterns of decline. No individual-level characteristics were associated with usability or adherence to watch wear. Smartwatches are promising for AF detection in older adults after stroke, though while they offer high accuracy and usability, adherence to wear is low. Strategies to encourage extended watch wear are necessary to realize the potential of smartwatches as a viable cardiac monitoring modality.

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