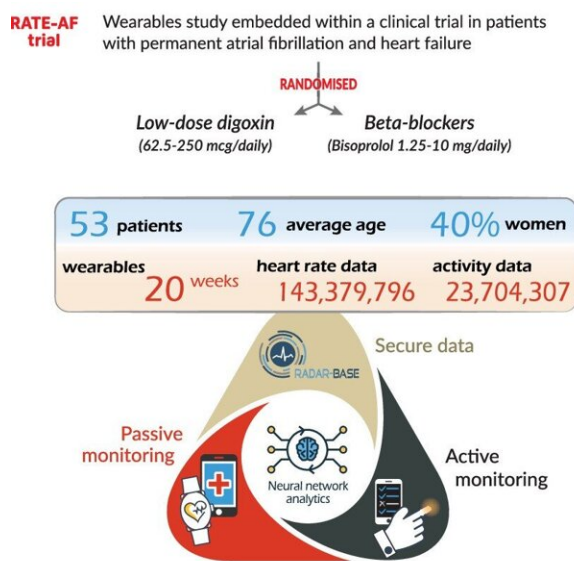


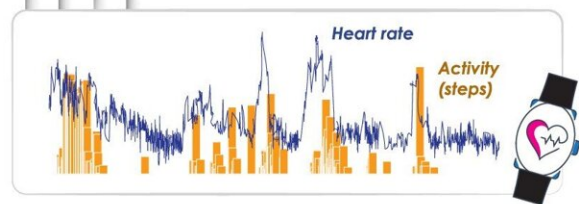
Off-the-shelf wearable trackers provide clinically-useful information for patients with heart disease

July 15 2024



DESIGN

- OUTCOMES**
- 01 Wearables able to continuously monitor heart rate and physical activity response to treatment change
 - 02 Feasible approach even in older patients with multiple comorbidities
 - 03 Wearable sensor data comparable to conventional in-person trial assessments
 - 04 No difference in heart rate for digoxin versus beta-blockers, including on exertion



Overview of the RATE-AF randomized trial wearable study. mcg = micrograms; mg = milligrams; RATE-AF = RAtE control Therapy Evaluation in permanent Atrial Fibrillation. Credit: *Nature Medicine* (2024). DOI: 10.1038/s41591-024-03094-4

A study [published](#) in *Nature Medicine* examined if a commercially-available fitness tracker and smartphone could continuously monitor the response to medications, and provide clinical information similar to in-person hospital assessment.

The [wearable devices](#), consisting of a wrist band and connected smartphone, collected a vast amount of data on the response to two different medications prescribed as part of a clinical trial called RATE-AF.

Led by researchers from the cardiac group at the University of Birmingham, the team used artificial intelligence to help analyze over 140 million datapoints for heart rate in 53 individuals over 20 weeks. They found that digoxin and beta-blockers had a similar effect on [heart rate](#), even after accounting for differences in physical activity. This was in contrast to previous studies that had only assessed the short-term impact of digoxin.

A [neural network](#) that took account of missing information was developed to avoid an over-optimistic view of the wearable data stream. Using this approach, the team found that the wearables were equivalent to standard tests often used in hospitals and clinical trials that require staff time and resources. The average age of participants in the study was 76 years, highlighting possible future value regardless of age or experience with technology.

Professor Dipak Kotecha from the Institute of Cardiovascular Sciences at the University of Birmingham and the lead author of the study said, "People across the world are increasingly using wearable devices in their daily lives to help monitor their activity and health status. This study shows the potential to use this new technology to assess the response to treatment and make a positive contribution to the routine care of patients."

"Heart conditions such as [atrial fibrillation](#) and [heart failure](#) are expected to double in prevalence over the next few decades, leading to a large burden on patients as well as substantial health care cost. This study is an exciting showcase for how [artificial intelligence](#) can support new ways to

help treat patients better."

More information: Simrat K. Gill et al, Consumer wearable devices for evaluation of heart rate control using digoxin versus beta-blockers: the RATE-AF randomized trial, *Nature Medicine* (2024). [DOI: 10.1038/s41591-024-03094-4](https://doi.org/10.1038/s41591-024-03094-4)

Provided by University of Birmingham

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