

Independent study finds Oura Ring most accurate wearable for heart rate variability and resting heart rate

Summary

A peer-reviewed study, published in *Physiological Reports*, found Oura Ring Gen3 and Oura Ring 4 consistently showed the strongest agreement for both heart rate variability (HRV) and resting heart rate (RHR) measurements, outperforming devices from WHOOP, Polar, and Garmin.

OVERVIEW OF STUDY



Objective

The purpose of this study was to assess the validity of nocturnal RHR and HRV from five wearable devices against an electrocardiogram (ECG) reference device.



Participants

Thirteen healthy adults wore an ECG reference device and multiple wearables simultaneously during sleep, totaling 536 nights.



Design

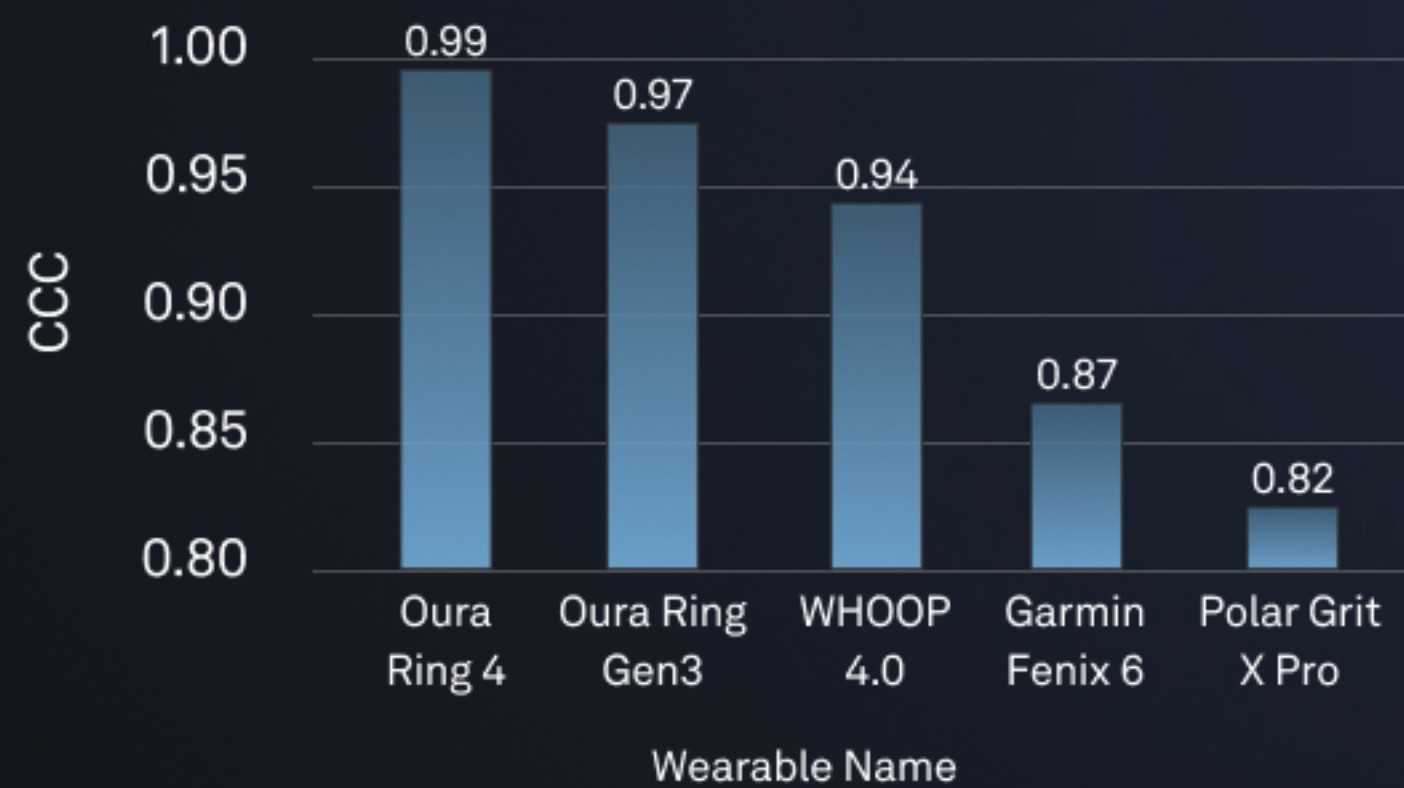
This was a real-world, home-based sleep study to mirror typical device usage, allowing for natural variations in sleep conditions such as body position, room temperature, and potential distractions or interruptions.

RESULTS

After analyzing the wearable data against the criterion assessment, researchers consistently observed the strongest accuracy for Oura Ring Gen3 and Oura Ring 4, compared to other wearables.

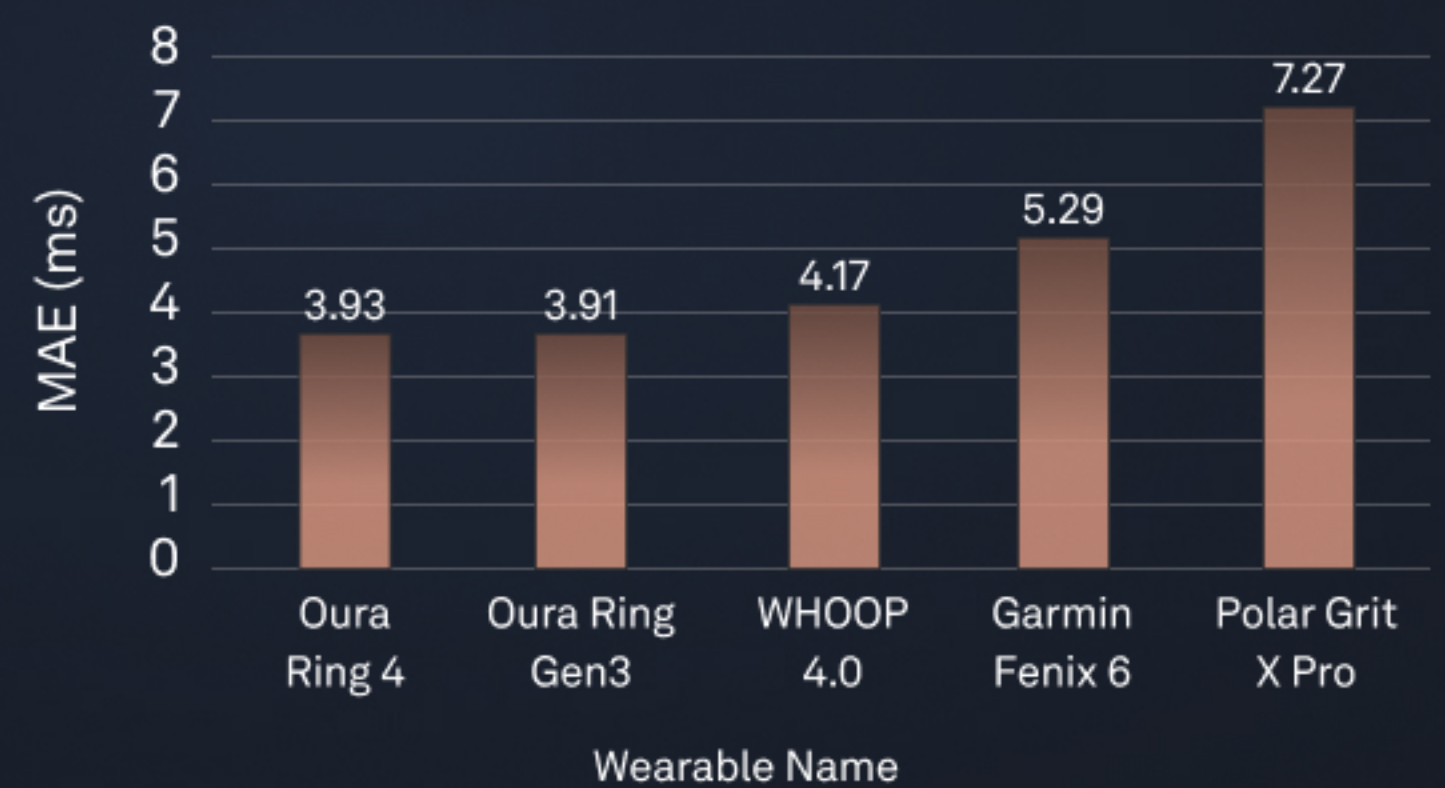
RESULTS

HRV Accuracy: CCC (Concordance Correlation Coefficient)



Oura Ring Gen3 and Oura Ring 4 demonstrated the highest degree of reliability, achieving Concordance Correlation Coefficients (CCC) of 0.97 and 0.99 respectively — outperforming wrist-worn devices.

HRV Accuracy: MAE (Mean Absolute Error)



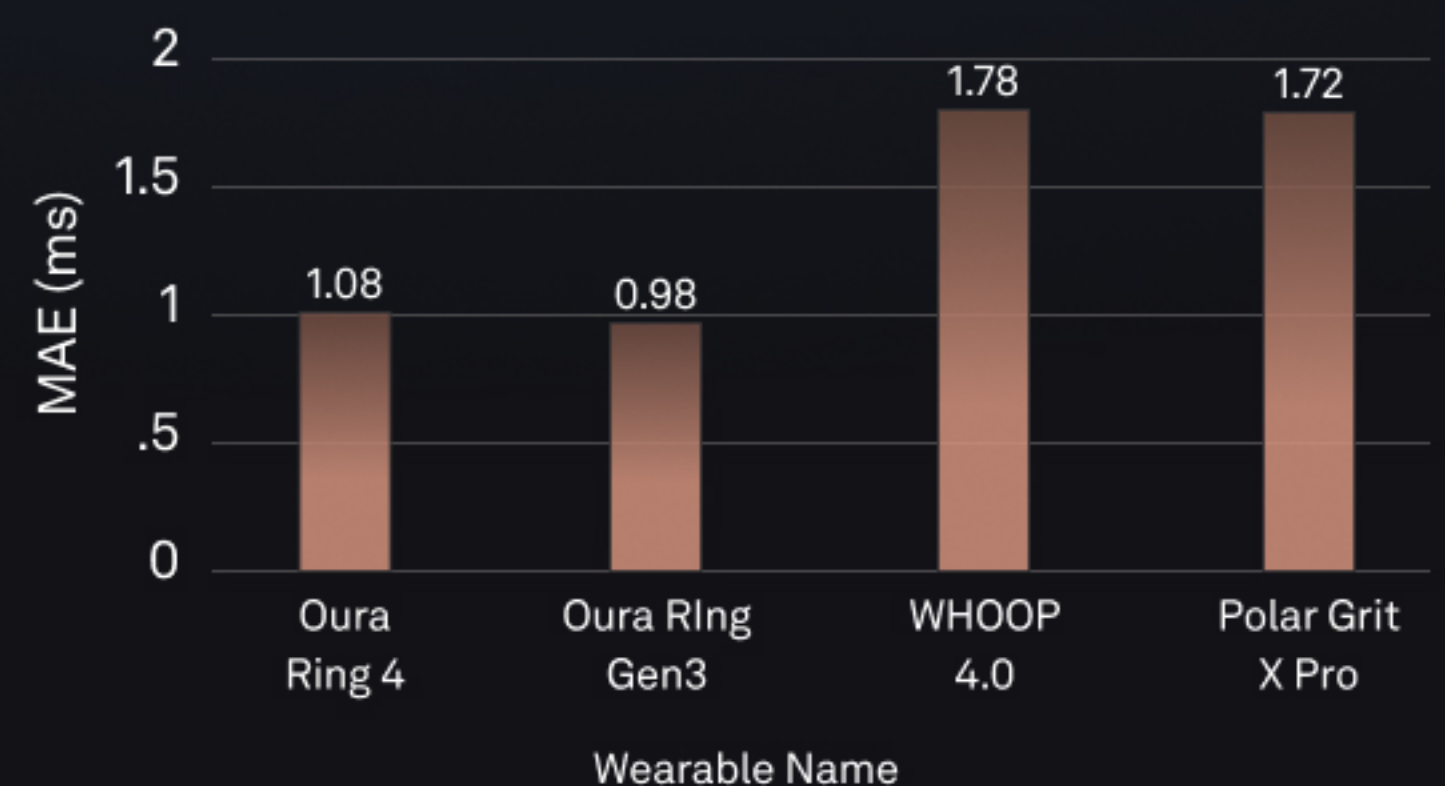
Oura devices minimized data discrepancies with the lowest Mean Absolute Error (MAE) for HRV (approx. 3.9ms) for the most accurate and reliable measurements compared to the gold-standard ECG reference.

RHR Accuracy: CCC (Concordance Correlation Coefficient)



Oura Ring Gen3 and Oura Ring 4 led in RHR precision, achieving "substantial" agreement by delivering near-perfect correlation with ECG gold-standard measurements.

RHR Accuracy: MAE (Mean Absolute Error)



Oura Ring Gen3 and Oura Ring 4 produced the lowest Mean Absolute Error (MAE) for RHR against the gold-standard measurements with a precision profile nearly 2x better than leading wrist-worn devices.

KEY TAKEAWAYS



Accurate data

Oura Ring Gen3 and Oura Ring 4, which are finger-worn devices, provide the most accurate metrics compared to wrist-worn devices included in the study with nearly identical performance.



Longitudinal use

Unlike traditional ECG methods, which are costly and impractical for continuous monitoring, wearable devices, like Oura Ring, enable long-term, real-world data collection in home environments.

Learn more about Oura for [healthcare providers](#) and [research](#).

Referenced study: Dial, et al., 2025, Validation of nocturnal resting heart rate and heart rate variability in consumer wearables, *Physiological Reports*.
This study was financially supported by the Air Force Research Laboratory.