Accuracy of Smartwatch Device ECGs for At-Home Cardiac Health Monitoring

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Background

- Smartwatches equipped with electrocardiogram (ECG) have potential to support decision-making tools.
- While current usage primarily revolves around rhythm classifications, there is a growing interest to use them for more sophisticated measurements such as corrected QT (QTc) monitoring.
- The QTc interval is crucial in assessing cardiac repolarization and detecting arrhythmias.
- The extent to which smartwatch ECGs can guide clinical decisions with QTc measurements remains uncertain.

Methods

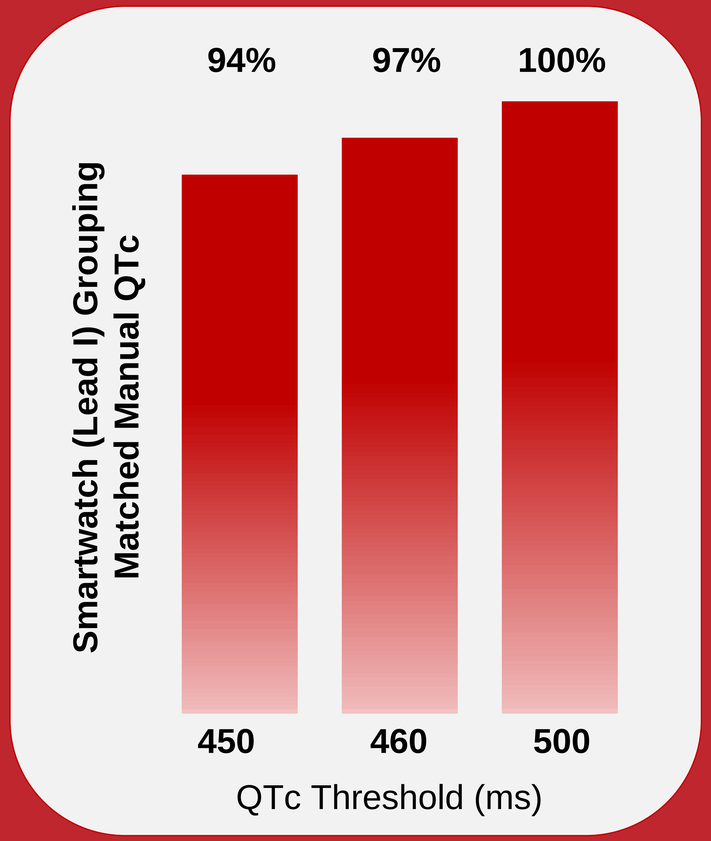
Searched literature databases from 1990-2022.

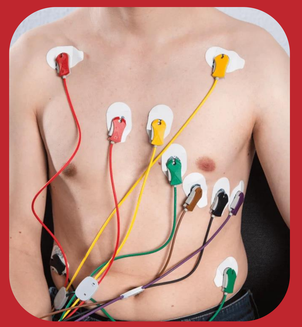
Articles were screened to identify studies that compared 12-lead ECG data to Smartwatch ECG data (Lead I).

Selected articles reported mean QTc intervals for both smartwatch and manual measurements, along with correlation coefficients.

Forest plot used to determine the mean difference between smartwatch and manual readings.

Smartwatch ECGs showed reasonable accuracy, cementing their use for at-home health monitoring





12L ECG

Smartwatch ECG

Highest reported specificity: **91.3%**

Highest reported correlation coefficient: **0.886**

SCAN to learn more

Results

- Six articles met the inclusion criteria. Four studies (n = 561) reported mean and standard deviations of QTc measurements from smartwatch and manual methods.
- Average sensitivity and specificity reported by three of these articles was 74% and **91.3%,** respectively.
- One article reported a Spearman correlation coefficient of **0.886** and used an Apple Watch Series 4 on 119 patients.
- Accuracy of the smartwatch (lead I) was **94% for QTc > 450 ms, 97% for QTc > 460 ms,** and **100% for QTc > 500 ms.**

What does this mean?

- The findings suggest that smartwatch ECGs offer reasonable accuracy in measuring QTc intervals.
- ***This underscores their utility in "hospital-at-home" care settings.***
- With continuous and non-invasive monitoring, smartwatches have the potential to improve patient outcomes while also reducing healthcare costs.
- Further research is needed to validate the accuracy of smartwatch ECGs among diverse patient populations and various clinical settings.

Disclosures

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