



# SSRI QT Tracker – Information for healthcare professionals

QT/QTc trend from single-lead ECGs in Apple Health – self-monitoring, not a medical device

## THE KEY FACTS

**Data source:** Single-lead ECGs from Apple Health, e.g. from an Apple Watch (Series 4 or later): 30 seconds, 512 Hz, similar to lead I.

**Measurement:** Signal-averaged beat built from the clean individual beats; QRS onset where the signal leaves the isoelectric line, T end by the tangent method.

**Correction:** QTcF (default), QTcB, Framingham and Hodges are calculated side by side; RR is the median RR interval of the recording.

**Classification:** Men 450 / 470 / 500 ms, women 460 / 480 / 500 ms. Additional flags for a rise of 30 ms and 60 ms over baseline.

**Baseline:** Mean of all usable measurements before the recorded start of therapy.

**Data protection:** All analysis runs on the iPhone only. No server, no account – patients share the report themselves.

## METHODOLOGY

1. **Pre-processing:** Removal of baseline wander and light low-pass smoothing.
2. **R-peak detection:** Pan-Tompkins principle: derivative, squaring, moving-window integration and an adaptive threshold.
3. **Selective averaging:** Each beat is correlated with a median template. The cleanest ~80% ( $r \geq 0.8$ ) form the averaged beat – ectopic beats and artefacts drop out.
4. **QRS onset:** From the steepest QRS slope back to the stable isoelectric PR segment.
5. **T end:** Tangent at the steepest point of the descending T-wave limb; its intersection with the isoelectric line is the T end (tangent method).
6. **Quality control:** QT dispersion across individual beats (standard deviation). Recordings with a heart rate above 120 bpm or an implausible QT are flagged and excluded from trend, baseline and risk statistics.

## REPORT CONTENTS

- Summary: median QTc with range, latest measurement, baseline, therapy period and share within the normal range
- Mean values before, during and after therapy
- QTc trend with risk zones and therapy markers, plus resting heart rate and HRV trends from Apple Health
- Averaged beat of every measurement with marked QRS onset and T end – for visual review
- Measurement table with date, heart rate, QT, QTcF, QTcB and classification
- Medications with dose and logged intakes (from Apple Health on iOS 26 or later)
- A4 in 31 languages or as an English US clinical report in Letter format

## QTC LIMITS

| CLASSIFICATION     | MEN           | WOMEN         |
|--------------------|---------------|---------------|
| Normal             | < 450 ms      | < 460 ms      |
| Borderline         | 450–469 ms    | 460–479 ms    |
| Prolonged          | 470–499 ms    | 480–499 ms    |
| Markedly prolonged | $\geq 500$ ms | $\geq 500$ ms |

## LIMITATIONS

- **Not a medical device:** The app is for self-monitoring. It does not diagnose and does not replace ECG monitoring as required by the prescribing information.
- **Not clinically validated:** The automatic measurement has not yet been systematically validated against the 12-lead ECG. We are looking for partners to do so (see below).
- **A single lead:** In a 12-lead ECG, QT is usually measured in the lead with the longest QT. Values from a single lead may differ, typically being shorter.
- **Difficult T waves:** Flat, biphasic or U-wave-overlapped T waves make T-end detection harder. That is why every averaged beat is shown for review.
- **Rhythm and rate:** In atrial fibrillation, bundle branch block or paced rhythm, QTc values are of limited value. Rate correction is meaningful between about 45 and 120 bpm.



More information, sample report and references:

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**Not a medical device.** No. The app is a self-monitoring diary. It does not diagnose, gives no treatment recommendations and does not replace ECG monitoring as required by the prescribing information. Abnormal values should be checked with a 12-lead ECG as usual.