

Abstract sessies Online NVVC Voorjaarscongres  
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**a Comparison of Over-the-Counter Available Smartwatches and Devices for ECG-based Detection of Atrial Fibrillation.**

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**Purpose:**

There is an increasing number of commercially available devices that can generate and automatically interpret an electrocardiogram (ECG). Nonetheless, there is limited data on sensitivity/specificity of these devices and comparative studies are lacking. Our purpose was to compare three frequently used devices for atrial fibrillation (AF) detection.

**Methods:**

We performed a prospective study in consecutive patients with AF presenting for electrical cardioversion (ECV). Standard 12L-ECGs were recorded before and after the ECV, which were interpreted by a cardiologist, and used as golden standard for heart rhythm. Simultaneously, we recorded 30 second ECGs with different devices: Withings Move ECG (lead I), Apple Watch series 5 (lead I), Kardia Mobile 6L (six leads) and Withings/Apple (1:1 ratio) on left knee (lead II). Sensitivity/specificity were determined for each AF detection algorithm excluding patients with atrial flutter or uninterpretable ECGs. Also, proportions of uninterpretable ECGs were determined.

**Results:**

A total of 178 patients were included (age  $70 \pm 11$  years, female 33%, first ECV 49%) and in total 342 12-lead ECGs were performed. All devices had comparable sensitivity/specificity (Withings 98%/95%, Apple 94%/99%, Kardia 99%/91%.  $P > 0.05$  for all). Withings, Apple and Kardia had a comparable rate of uninterpretable ECGs (20%, 22%, 24%, respectively.  $P > 0.05$  for all). Lead II had higher rate of uninterpretable ECGs (35%,  $p < 0.001$ ).

**Keywords:**

Atrial fibrillation, ECG monitoring, Smartwatch Atrial fibrillation

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**Figure:**

Table 1: Overview of sensitivity/specificity and proportion uninterpretable ECGs for each smartwatch/device

<b>Device</b>	<b>Lead</b>	<b>Sensitivity (%)</b>	<b>Specificity (%)</b>	<b>Uninterpretable (%)</b>
Withings Move ECG	Lead I	97,7	95,2	19,9
Apple Watch series 5	Lead I	93,8	98,5	21,7
Withings (50%)/Apple (50%)	Lead II	93,6	98,3	34,5
Alive Cor Kardia 6L	Six leads	99,2	90,9	24,4