Digital Engagement With A Patient Smartphone App Is Associated With Increased Symptom **Reporting And Symptom-Rhythm Correlation In Patients Undergoing Ambulatory Cardiac Monitoring**

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Background

- Patient-reported symptoms are most common indication for ambulatory cardiac monitoring (ACM) and key component of arrhythmia management.
- Symptom severity and context are useful in risk stratification and traditionally captured in paper diaries.
- MyZio® is a patient Smartphone App (iOS and Android) for use with Zio® ACM devices (iRhythm Technologies, Inc; San Francisco, CA). Enables digital symptom logging and is associated with improved rates of ACM device return¹.
- Association of the App with symptom-rhythm correlation is not well established.

Objective

• To evaluate impact of MyZio App digital symptom logging, as compared to paper patient diaries, on symptom-rhythm correlation (SRC).

Methods

- Retrospective random sample of patients \geq 18 yrs prescribed Zio ACM (Monitor, XT or AT) in the US for up to 14 days between Jan 1 and Jun 30, 2024.
- Symptoms identified by button press within ±45 second window of an arrhythmia were considered rhythm correlated (Figure 1).
- Symptom details could be logged by paper diary or entries in a digital diary available to App users (Figure 2).
- Continuous ECG data were divided into epochs (short duration) rhythm segments) for classification using FDA-cleared algorithm.
- Percentage of symptomatic episodes documented by button press or diary entry were calculated for App users and non-users.
- Odds ratios with 95% CI were calculated to compare groups.

Figure 1. Symptom Button: Zio[®] Monitor Long-Term Continuous Monitor

Patient can press the symptom button to mark the time of a symptom on the recorded ECG data, allowing for correlation of symptoms with any detected arrhythmia.

Zio Monitor is an FDA cleared device.



The Zio monitor is a prescription-only, single-use ECG monitor that continuously records data for up to 14 days. It is indicated for use on patients who may be asymptomatic or who may suffer from transient symptoms such as palpitations, shortness of breath, dizziness, lightheadedness, pre-syncope, syncope, fatigue, or anxiety.

Figure 2. Symptom Logging Methods: D



Results

- Among 164,661 patients, 30,299 (18.4%) used the MyZio App (Figure 3).
- App users younger (mean 50.1 vs. 64.1 yrs.), more likely to be female (62.2% vs. 53.9%), and had lower arrhythmia yield² (59.6% vs. 77.4%) vs. non-users.
- App users had increased odds of rhythm-correlated symptoms by button press (OR=1.86; 95%CI 1.84-1.89) and diary entry (OR=3.44; 95%CI 3.38-3.50) (Table).
- Overall engagement was greater among App users, with higher rate of episodes identified by button press alone and per-patient SRC³ (16.0% vs. 13.9%).
- Additional impact of MyZio App: 1.85X increase in rate of rhythm-correlated diary entries (OR 1.85, 95%CI 1.81-1.89) over increase in rate of rhythm-correlated button presses alone.

Table. Arrhythmia Epochs and Per-Patient Rhythm-Correlated Symptoms With and Without Use of the MyZio Patient-Dedicated Smartphone App					
Arrhythmia Episodes	MyZio App Users (N=30,299)	Did Not Use MyZio App (N=134,362)	Odds Ratio (95% CI)	P-value	
Total number of episodes ⁺ (n)	22,792,910	147,170,510			
Symptomatic episodes (n, %)	51,090 (0.22%)	146,644 (0.10%)	2.25 (2.23-2.28)	<0.001	
Symptomatic episodes identified by button press* (n, %)	31,840 (0.14%)	110,499 (0.08%)	1.86 (1.84-1.89)	<0.001	
Symptomatic episodes identified by diary entry** (n, %)	19,250 (0.08%)	36,145 (0.02%)	3.44 (3.38-3.50)	<0.001	

⁺Episodes include any AF, SVT, VT (including PVT, TdP, VF), pause, AVB (any 2nd Deg or CHB), bigeminy, trigeminy, ectopic atrial rhythm, idioventricular rhythm, and junctional rhythm.

*Button press includes only episode identification using a button press.

**Diary entry includes episode identification using diary entry only or diary entry plus button press.

gital or Pape	er Diaries		
	PENCIL (D)		
	When did you press the button?		
ymptoms	(MM / DD / YYYY		
symptom			
n on your ECG monitor	Fainted		
t flash when the button is pressed	 Irregular beats 	Short of breath	
nash when the button is pressed.	Other		
for the button press in this	_		
L			
button was pressed			
press	How long did this last?	?	
symptom was experienced	1 min or less	 1 hour or less Mana than 1 hour 	
		O More than I hour	
	What were you doing o	during this time?	
e requested entries on the Symptom Log or			
d with the device will not be documented or			
o share additional information with them.		7	



Conclusions

- contextual clinical information.
- enhancing product ease of use.

Limitations

References and Definitions

- 1. Battisti et al. Circulation 2024;150 Suppl 1. A4139306.

Disclosures

E Barnhill, R Pinkerton, C Gordon, A Fan, V Fokin, and AJ Battisti are employees of and have received equity from iRhythm Technologies, Inc. Dr. Turakhia has received equity from iRhythm, Connect America, Evidently, PocketRN, AliveCor, and Hippocratic.ai. Dr. Turakhia is an employee and corporate officer of iRhythm Technologies, Inc.

• • • • ×		My Log
w are you feeling? 🕕	When did you feel the symptom(s)?	10 Symptoms
Pain Fainted	September 17, 2018 at 9:30 PM	Fainted, Light Headed, Short of Breath
ٱ (``	How long did you feel the symptom(s)?	May 6, 2023 at 7:42 AM Duration: 20 minutes Activity: Walking
r Beats Light Headed	1 min or less10 min or less1 hour or lessMore than 1 hour	While walking my dog, I started to feel short of breath and briefly fainted afterwards.
) ≦≈		
ng Short of Breath		Chest Pain, Irregular Beats, Racing, Short of Breath,
		May 5, 2023 at 5:14 PM
r		Activity: Sitting
Continue	Save	I was sitting down and I started to teel a

• In patch-based ACM, use of a dedicated patient app was associated with increased symptom logging, greater symptom-rhythm correlation and greater rate of arrhythmia-correlated diary entries.

Use of a patient digital app as an adjunct to ACM can provide greater

Data underscore use of patient digital health interventions in

 Symptoms may have been present but not reported by diary in some cases. Rates of participation by MyZio App use/Paper Diary use not pre-specified. • Findings are unadjusted for differences in sex, age or user engagement.

2. 'Arrhythmia Yield' defined as % of patients with any episode of AF \geq 30 sec, SVT \geq 90 bpm & \geq 4 beats, VT \geq 100 bpm & ≥ 4 beats, including PVT/TdP/VF, Pause ≥ 3 sec, and/or AVB (any 2nd Deg or CHB). 3. 'Per-patient SRC' defined as % of patients with ≥ 1 rhythm-correlated button press during wear.