

Nov 7th, 8:00 AM

# Acceptability of a Novel Smartphone Application for Rhythm Evaluation in Patients with Atrial Fibrillation

Daniel J. Amante

*University of Massachusetts Medical School*

Thomas M. English


*University of Massachusetts Medical School*

Jane S. Saczynski

*University of Massachusetts Medical School*

*See next page for additional authors*

Follow this and additional works at: [http://escholarship.umassmed.edu/chr\\_symposium](http://escholarship.umassmed.edu/chr_symposium)

 Part of the [Cardiovascular Diseases Commons](#), [Civic and Community Engagement Commons](#), [Community-Based Research Commons](#), [Community Health and Preventive Medicine Commons](#), [Diagnosis Commons](#), [Health Information Technology Commons](#), and the [Translational Medical Research Commons](#)

Amante, Daniel J.; English, Thomas M.; Saczynski, Jane S.; Esa, Nada; Nieto, Iryna; Chon, Ki H.; and McManus, David D., "Acceptability of a Novel Smartphone Application for Rhythm Evaluation in Patients with Atrial Fibrillation" (2014). *Community Engagement and Research Symposia*. 2.  
[http://escholarship.umassmed.edu/chr\\_symposium/2014/posters/2](http://escholarship.umassmed.edu/chr_symposium/2014/posters/2)

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in Community Engagement and Research Symposia by an authorized administrator of eScholarship@UMMS. For more information, please contact [Lisa.Palmer@umassmed.edu](mailto:Lisa.Palmer@umassmed.edu).

---

**Presenter Information**

Daniel J. Amante, Thomas M. English, Jane S. Saczynski, Nada Esa, Iryna Nieto, Ki H. Chon, and David D. McManus

**Creative Commons License**

This work is licensed under a [Creative Commons Attribution-Noncommercial-Share Alike 3.0 License](https://creativecommons.org/licenses/by-nc-sa/3.0/).

# Acceptability of a Novel Smartphone Application for Rhythm Evaluation in Patients with Atrial Fibrillation

Daniel J. Amante, MPH,<sup>1</sup> Thomas M. English, PhD,<sup>1</sup> Jane S. Saczynski, PhD,<sup>1,2</sup> Nada Esa, MD,<sup>2</sup> Iryna Nieto, MD,<sup>2</sup> Ki H. Chon, PhD,<sup>3</sup> David D. McManus, MD ScM<sup>1,2,4</sup>

<sup>1</sup>Department of Quantitative Health Sciences, University of Massachusetts Medical School, Worcester, MA;

<sup>2</sup> Department of Medicine, University of Massachusetts Medical School, Worcester, MA;

<sup>3</sup>Department of Biomedical Engineering, University of Connecticut, Storrs, CT;

<sup>4</sup>Department of Biomedical Engineering, Worcester Polytechnic Institute, Worcester, MA



## Background/Aims

Atrial fibrillation (AF) is the world's most common, serious health rhythm problem. In its early stages, most cases of AF are paroxysmal (pAF), making timely detection of the disease difficult. Long-term, home cardiac monitoring can be clinically impactful but existing technologies have cost or methodological limitations. Smartphone use is increasing and may provide an inexpensive and user-friendly means to diagnose AF.

Our aim was to examine patient acceptability of using PULSESMART, a novel smartphone application co-developed by investigators at UMass Medical School and WPI to detect AF.

## Methods

52 adults with pAF presenting to the University of Massachusetts Medical Center for electrical cardioversion underwent rhythm assessment using a novel iPhone 4S application before and after electrical cardioversion and answered a brief survey.

To examine patient acceptability, we looked at responses to 3 specific questions: 1) How easy was it to use? 2) How important could it be for you? and 3) To what extent does it fit into your daily life?

## Baseline Characteristics of Participants

Demographic Characteristics	
Age, years, M (SD)	68.5(10.7)
Sex, male, n (%)	31 (59.6)
White Race, n (%)	48 (92.3)
Medical Characteristics, n (%)	
Hypertension	44 (86.3)
Hyperlipidemia	36 (70.6)
Coronary artery disease	14 (27.5)
Diabetes mellitus	19 (37.3)
Congestive heart failure	26 (51.0)
Body Mass Index, kg/m <sup>2</sup> , M (SD)	30.4 (7.6)

## Conclusions

In a prospective cohort study of 52 adults with AF, we found that patients are receptive to using smartphone applications as a supplement to more intensive and expensive diagnostic tools.

Since it requires no additional hardware, is real-time realizable, and generally acceptable to the patient population, our smartphone application may be useful to improve AF detection in the general population.

Further data are needed to explore the feasibility and efficacy of using smartphone-based applications for AF detection in older, at-risk populations and out-of-hospital settings.

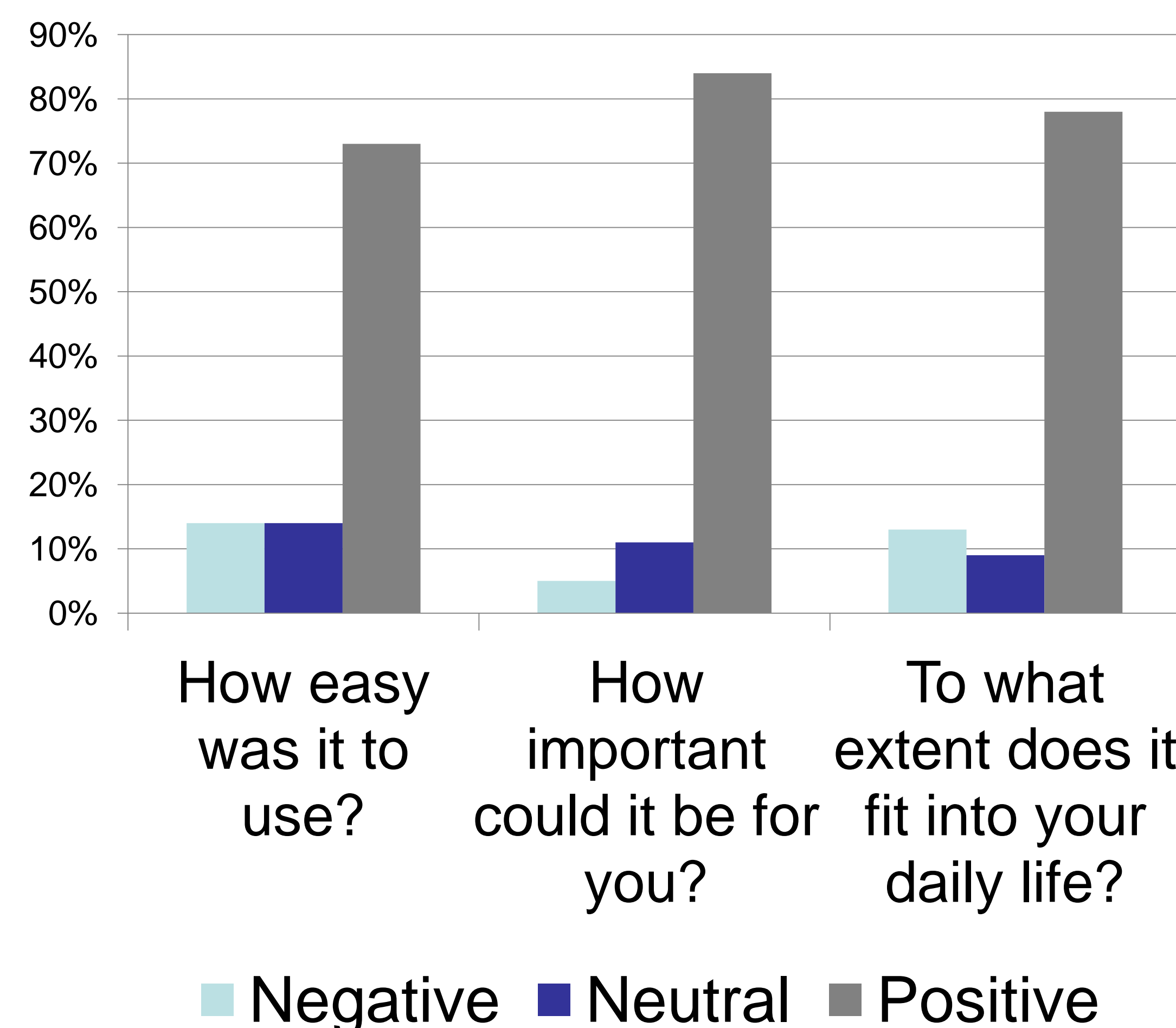
## Future Steps

•Qualitative Work: To complement the initial survey results, focus groups and semi-structured interview should be conducted to obtain enriched data on patient and provider perspectives on the acceptability and usefulness of the technology.

•Larger study: Study findings that patients are receptive to the technology should be replicated in a larger cohort consisting of more sustained use.

•Clinically relevant testing situations: The technology should be applied to areas of clinical practice which it may be particularly beneficial. One such area is to detect heart arrhythmias in patients experiencing cryptogenic strokes.

## Patient Acceptability Feedback



## An iPhone Application for AF Detection



## Collaborative Work

We are actively looking for collaborations in the fields of health information technology, mhealth, and patient-facing technologies.

If you are an engineer, qualitative researcher, clinician, or biostatistician and are interested in collaborating in related Health IT research, please contact us.