



Diagnostic Accuracy of a Smartphone-Operated Single-Lead ECG for Detection of Rhythm and Conduction Abnormalities in Primary Care

Divya Manda, MD, Grant Family Medicine, Michael E Jobansen, MD, MS, Associate Editor

Ann Fam Med 2019;17(5):iii. <https://doi.org/10.1370/afm.2458>.

The *Annals of Family Medicine* encourages readers to develop a diverse learning community to think critically about important issues affecting primary care, conduct journal clubs, and act on those discussions.¹

HOW IT WORKS

In each issue, the *Annals* selects an article and provides discussion tips and questions. Post a summary of your conversation in our online discussion. (Open the article and click on "TRACK Discussion/ Submit a comment.") Discussion questions and information are online at: <http://www.AnnFamMed.org/site/AJC/>.

CURRENT SELECTION

Article for Discussion

Himmelreich JC, Karregat EP, Lucassen WA, et al. Diagnostic accuracy of a smartphone-operated, single-lead ECG for detection of rhythm and conduction abnormalities in primary care. *Ann Fam Med*. 2019;17(5):403-411.

Discussion Tips

Many patients present to primary care physicians with symptoms that are suspicious for cardiac arrhythmias, but 12-lead ECGs to evaluate the symptoms are not always available or are cumbersome. This article describes a blinded case series to evaluate the utility of a smartphone-enabled 1-lead ECG.

Discussion Questions

- What does this study investigate and why does this matter?
- How is this study different from previous studies about smartphone-enabled ECGs? What does this study add to the field?
- How strong is the study design to answer the researchers' questions?
- Define sensitivity, specificity, likelihood ratios, positive/negative predictive value. How are these calculated?
 - What are some criticisms about the use of these values?^{2,3}

- What were the primary and secondary findings of the study? How accurate was 1-lead ECG for detecting atrial fibrillation/atrial flutter vs other arrhythmias vs ectopic beats? Is there value in combining these end points?
 - Importantly, what does this study not investigate?
- To what degree can the findings be accounted for by:
 - How patients were selected, excluded, or lost to follow-up; how the main variables were measured?; confounding variables, and how the findings were interpreted?
- How applicable are the study results to your patient population? How applicable are the study results in a typical primary care office? What is the transportability of the findings?
- How might spectrum bias be relevant to this study?
- How might the study change your practice? Would you be more likely to use a smartphone-enabled 1-lead ECG in your office or at home visits?
- What are the limitations of the study and how may this limit the applicability of the results?
- How does this study relate to and differ from the discussion around using smartphone ECG as a screening tool?⁴
- What are next steps in applying the findings to clinical practice and in primary care?
- What research questions remain regarding the use of smartphone-enabled 1-lead ECGs in primary care?

References

1. Stange KC, Miller WL, McLellan LA, et al. *Annals Journal Club: It's time to get RADICAL*. *Ann Fam Med*. 2006;4(3):196-197. <http://annfammed.org/cgi/content/full/4/3/196>.
2. Janssens AC, Deng Y, Borsboom GJ, Eijkemans MJ, Habbema JD, Steyerberg EW. A new logistic regression approach for the evaluation of diagnostic test results. *Med Decis Making*. 2005;25(2):168-177.
3. McNutt R, Hadler NM. Rethinking our thinking about diagnostic tests: there is nothing positive or negative about a test result. <https://thehealthcareblog.com/blog/2015/12/01/rethinking-about-diagnostic-tests-there-is-nothing-positive-or-negative-about-a-test-result/>. Accessed Aug 9, 2019.
4. Mandrolia J, Foy A. Downsides of detecting atrial fibrillation in asymptomatic patients. *Am Fam Physician*. 2019;99(6):354-355.