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# Medtronic LINQ™ family of insertable cardiac monitors with AI-based algorithms accurately predicts risk thresholds for patients with atrial fibrillation

DEFINE AFib results at AF Symposium 2025: First-of-its-kind app-based study uses AF burden data to identify patients at high risk for AF-related healthcare utilization

LINQ™ insertable cardiac monitors showed 4 times greater episode sensitivity compared to Apple Watch™\*

Primary results from the DEFINE AFib clinical study show the Medtronic LINQ family of insertable cardiac monitors (ICM), paired with a novel algorithm, were able to detect atrial fibrillation episodes and properly risk stratify patients as high risk prior to an AF-related healthcare utilization 80% of the time. Using artificial intelligence (AI)-based algorithms, the Reveal LINQ™ and LINQ II™ ICMs quantified AF burden (a measure of time a person spends in atrial fibrillation during a monitored period) to inform treatment decisions and help anticipate future healthcare needs. The results were presented at the AF Symposium 2025.

By 2030, approximately 12.2 million people in the U.S. will have AF, an irregular and potentially dangerous heart rhythm.<sup>i</sup> Despite AF being a serious, chronic and progressive disease, there remains a lack of clinical consensus on AF burden thresholds and how much AF is clinically relevant.<sup>ii</sup> The DEFINE AFib clinical study enrolled 973 patients using an app-based enrollment feature and characterized the impact of AF burden on patient outcomes and quality of life. Using the data, researchers built an algorithm capable of predicting patients' risk of needing AF-related healthcare in the next 30-day period, in addition to predicting clinically meaningful reductions in patient-reported quality of life.

Results from the study showed that 22% of study participants who crossed into the high-risk threshold for the first time experienced an AF-related healthcare utilization (AFHCU) at a mean time of  $164 \pm 145$  days compared to 9% of patients in the low-risk group. The data supports the conclusion that the AI-based analytics from the ICMs provide valuable information, particularly for those at a higher risk of an AF-related hospitalization, clinic visit, or therapeutic intervention.

"The first-of-its-kind DEFINE AFib study leveraged a unique design that engaged patients from the very beginning.

We know that how much AF a patient experiences matters, but we don't know how different durations or patterns impact the risk of future health events. Combining continuous rhythm monitoring with traditional risk factors has helped clarify how AF burden and patterns can inform risk, prioritization, and treatment decisions," said Jonathan P. Piccini, M.D., clinical cardiac electrophysiologist and professor of medicine and population health at Duke University Hospital and the Duke Clinical Research Institute, and chair of the DEFINE AFib clinical study steering committee. "Using upgraded AI-based algorithms and ICM data, physicians are better equipped to understand variance in patients' AF patterns, offering the opportunity to provide the right patient with the right therapy at the right time."

### **Performance of consumer wearables in AF detection**

A sub-analysis from the DEFINE AFib clinical study, recently presented at the European Society of Cardiology (ESC) Congress in 2024, showed important differences in performance between the LINQ family of ICMs and the Apple Watch™\* for AF episode detection. Notably, 40% of AF episodes (191 episodes) occurred while the Apple Watch was not being worn; AF episodes can often occur at night while wearables are often taken off to recharge. In addition, when worn, the Apple Watch was only able to detect 26% of AF episodes (lasting 75 minutes or more) that the LINQ ICM detected.<sup>iii</sup>

"Wearables allow patients to capture more real-time heart health data than ever before, but medical grade technology, like the LINQ family of ICMs, is necessary to provide clinicians with an accurate and reliable way to detect and manage cardiac conditions like AF," said Alan Cheng, M.D., chief medical officer of the Cardiac Rhythm Management business, which is part of the Cardiovascular Portfolio at Medtronic. "These findings also indicate that, while consumer-grade devices such as smartwatches and monitors can provide some insights into overall heart health, they are limited in their ability to screen for and help manage chronic conditions like AF. Medical grade devices with continuous monitoring capabilities like ICMs are more appropriate."

The DEFINE AFib clinical study used AI and machine-learning techniques to analyze changes in AF burden over time; the ICM-based model separated individuals into high- vs low-risk of AFHCU groups. AFHCUs included clinical actions such as ablation, cardioversion, initiation/intensification of rate or rhythm control medication, or progression to a pacemaker or implantable cardioverter-defibrillator.

### **About Medtronic**

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Contacts:

Joey Lomicky  
Public Relations  
+1-763-526-2494

Ryan Weispfenning  
Investor Relations  
+1-763-505-4626

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<sup>i</sup> Centers for Disease Control and Prevention. (2024, May 15). About Atrial Fibrillation. Centers for Disease Control and Prevention. <https://www.cdc.gov/heart-disease/about/atrial-fibrillation.html>

<sup>ii</sup> Chen, L. Y., Chung, M. K., Allen, L. A., Ezekowitz, M., Furie, K. L., McCabe, P., Noseworthy, P. A., Perez, M. V., & Turakhia, M. P. (2018). Atrial fibrillation burden: Moving beyond atrial fibrillation as a binary entity: A scientific statement from the American Heart Association. *Circulation*, 137(20).  
<https://doi.org/10.1161/cir.0000000000000568>

<sup>iii</sup> [https://academic.oup.com/eurheartj/article/45/Supplement\\_1/ehae666.3538/7839071](https://academic.oup.com/eurheartj/article/45/Supplement_1/ehae666.3538/7839071)

<https://news.medtronic.com/Medtronic-LINQ-TM-family-of-insertable-cardiac-monitors-with-AI-based-algorithms-accurately-predicts-risk-thresholds-for-patients-with-atrial-fibrillation>