



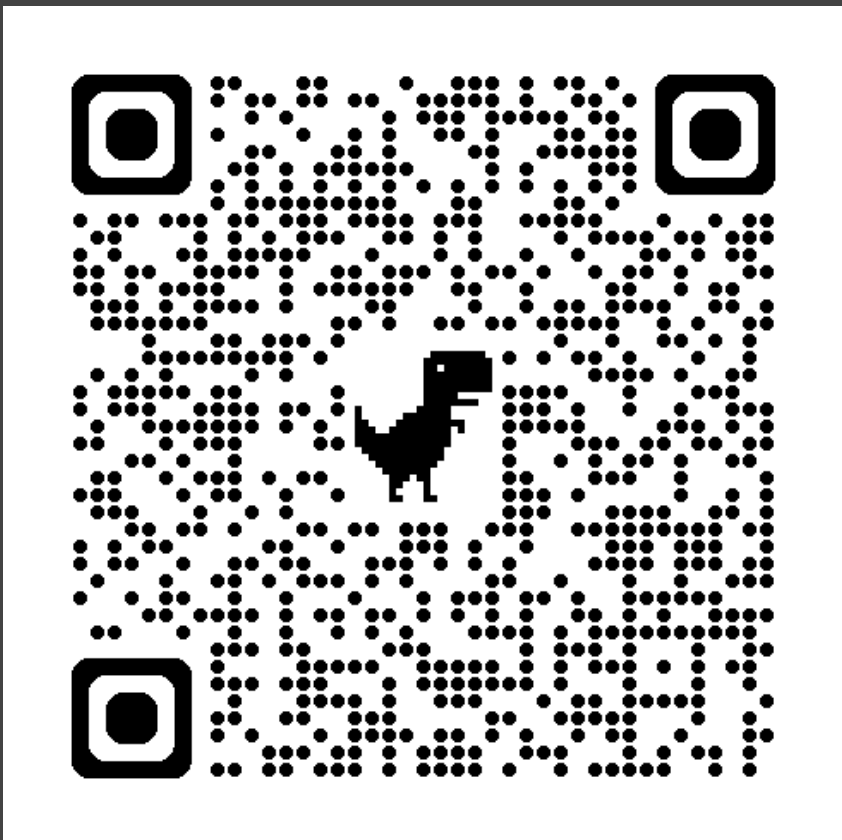
University of Colorado  
Anschutz Medical Campus

Developing a Physician  
Sleep Research App  
Without Developer  
Expertise: Insights from  
Apple’s Limited Beta  
Program

Maren Clark MS,<sup>1</sup> Jonathan Gomez-Picazo BS,<sup>1</sup> Walter Williamson MS,<sup>2</sup> Andrew Leroux PhD,<sup>2</sup> Elizabeth Goldberg MD, ScM<sup>1</sup>

<sup>1</sup>Department of Emergency Medicine,  
University of Colorado Anschutz Medical  
Campus, Aurora, CO USA

<sup>2</sup>Department of Biostatistics and Informatics,  
Colorado School of Public Health, University  
of Colorado, Aurora, CO USA

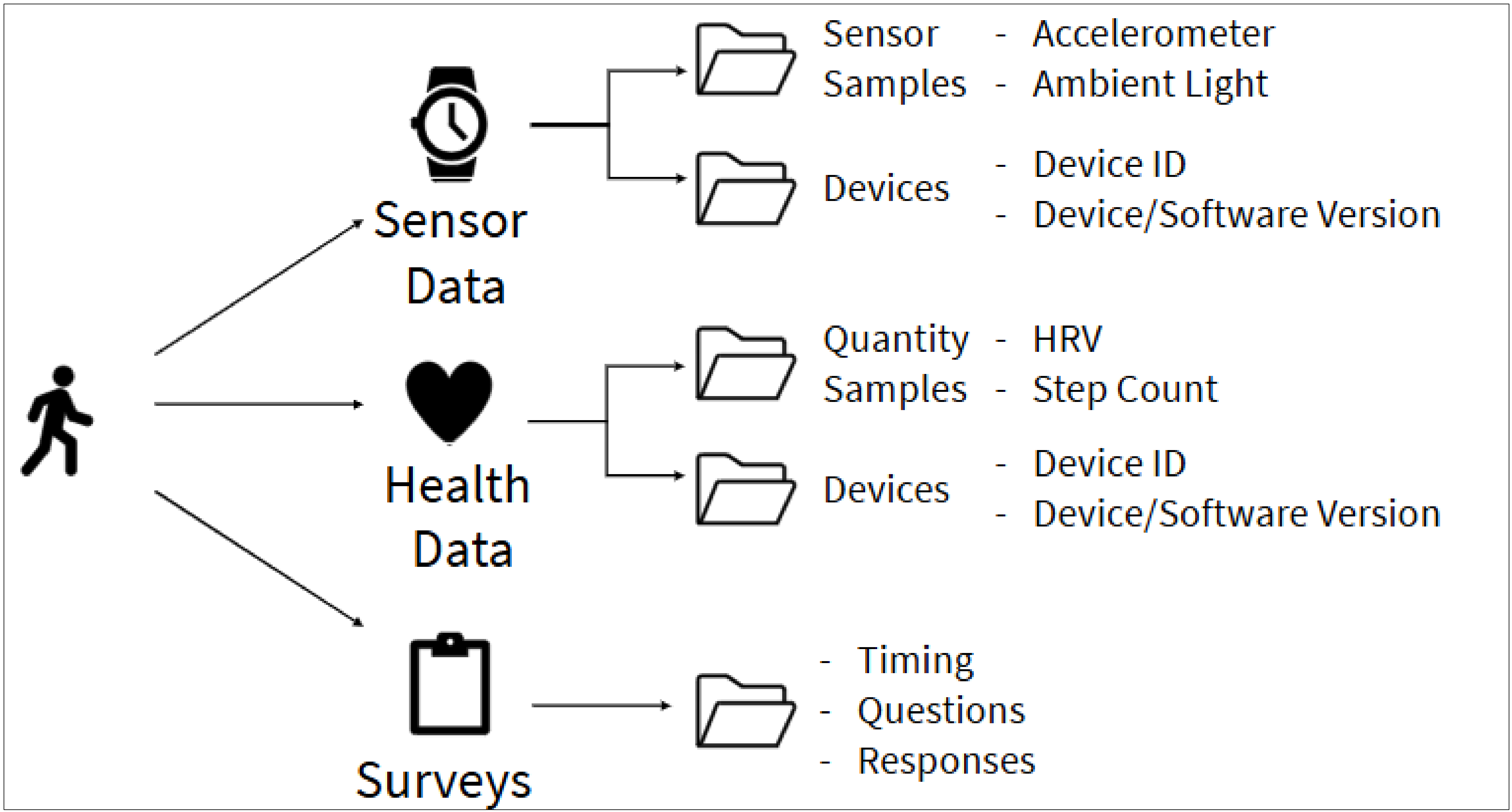


References + More  
Information

ACKNOWLEDGEMENTS

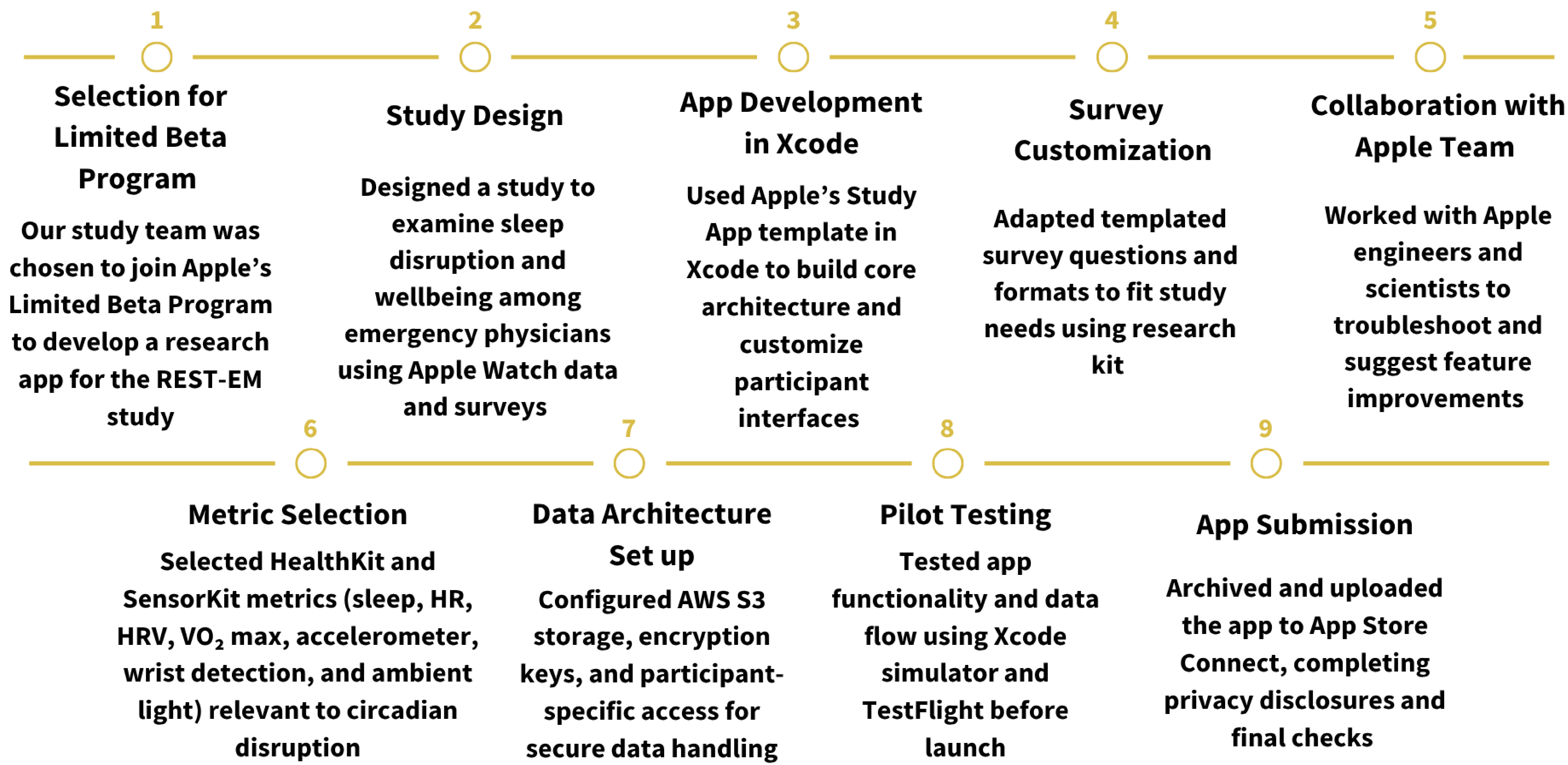
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Apple’s Limited Beta Program decreased barriers to integrating wearable sensors into clinical research. Our team’s experience highlights the potential of industry-academic partnerships to further innovation and improve application of sensor-based research in clinical environments.



Schematic of Encrypted Data Flow from Participant's Apple Watch to AVS S3 Bucket

APP DEVELOPMENT TIMELINE



BACKGROUND

- Wearable sensors are increasingly used in clinical research for continuous, non-invasive data collection<sup>1,2</sup>
- Building custom apps to capture this data often requires technical expertise and resources<sup>1,3,4</sup>
- Apple launched the Limited Beta Program to provide a templated framework for researchers without formal software development training

PURPOSE

- Share the experience of a physician-scientist led team using Apple’s Limited Beta Program to develop and deploy a research app for REST-EM, a physician sleep and wellbeing study

METHODS

- Participated in Apple’s Limited Beta Program in 2024
- Used the Study App Template in Xcode to create an app for the REST-EM study
- Collected HealthKit data (e.g., sleep duration, HRV, body temperature) and SensorKit data (accelerometer), and administered validated surveys via ResearchKit
- Securely stored data on AWS and integrated with REDCap

RESULTS

- Built and launched the app within six months at no cost despite no prior app development experience
- Enrolled 164 participants as of November 2025
- Challenges: survey customization, app publishing, user permission settings
- Solutions: collaboration with Apple engineers, workarounds for unsupported features, remote participant support.

CLINICAL RELEVANCE

- Demonstrates that clinician-led teams can develop research apps without software developers
- Highlights a pathway for integrating wearable technology into clinical research and care
- Supports broader access to personalized health insights and innovation in clinical research