



ActiGraph is a pioneer and innovator in the field of wearable-enabled digital measurement solutions.

“Long-term, continuous data collection puts usability front and center. We debated each and every detail, such as size and weight of the watch, the shape of the PPG lens, the watch band materials, and so on, to deliver this unique DHT product with high usability and technical excellence.”

— Christine Guo

Chief Scientific Officer,  
ActiGraph



## The situation



- ActiGraph recently released a new hardware, [LEAP](#), the next generation multisensor wearable for patient-centered clinical research with a focus on combining patient comfort and ease of use with fit-for-purpose digital measures.
- Sensor-based digital health technologies (sDHTs) include hardware, firmware, and software components and they each have different implications for design specification, usability testing, feedback, and change management. Hardware components tend to have the highest impact on usability for the end-user, but it is the most expensive and time-consuming to iterate.

## The impact



- The usability component of the V3+ Framework provides guidance for product developers to incorporate usability testing into the product development life cycle. Aligning with the framework, ActiGraph LEAP is a first-of-its-kind wearable DHT, purposely built for long term continuous use in patients' home, with a comprehensive sensor suite that can be use to derive a wide spectrum of digital measures and use cases.
- One such case is the use of nocturnal scratch and sleep measures. ActiGraph is currently planning a clinical study dedicated to the analytical validation of the associated algorithms applied to the sensor data from LEAP. Further usability testing is included as part of this study, [DECODE: Nocturnal Scratch](#). ActiGraph's final digital product of nocturnal scratch will support updated firmware and software components based on the study outcomes and incorporation of additional usability testing.

## The resource



- Months of multi-stakeholder discussion based on scientific, engineering, and operations expertise and patient experience went into the design stage of ActiGraph LEAP to ensure the most technically capable devices that patients are willing to wear continuously over months or years, elucidating the importance of the use specification component of DiMe's [V3+ Framework](#). Optimal design specifications from the beginning is key to minimizing future iterations.
- The initial two rounds of formative usability testing were primarily focused on testing features related to the hardware components and basic firmware functionality. Coupling design, formative testing, and use-related risk analysis, provided a pragmatic process for conducting usability testing.