Lung
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ABSTRACTS

Abstracts from the 2023 American Cough Conference

ACC2307. Validation of the Hyfe Cough Monitoring System

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Background: Cough is one of the most common reasons for which patients seek medical care. Accurate and reliable monitoring of cough is essential for both clinical care and drug development. Additionally, reliable monitoring allows for further cough frequency evaluation—for meaningful dynamics and patterns. Current cough monitoring systems have limitations, including patient discomfort and inconvenience, and monitoring periods limited to 24 h. We have developed a new smartwatch-based privacy-preserving cough monitoring system—Hyfe CoughMonitor—that passively monitors, detects and quantifies coughs utilizing Artificial Intelligence. The system is non-intrusive, easy to use, and provides continuous, accurate cough monitoring.

Methods: We are conducting a multi-center validation study to assess the accuracy and reliability of the CoughMonitor. At least 18 participants are being recruited and instructed to wear the Hyfe CoughMonitor smartwatch and another smartwatch serving as a continuous audio recorder, and go about their day as usual, without turning off the devices for the duration of 24 h. All audio recordings are being manually reviewed and labeled by a minimum of two specially trained cough labelers. Cough results measured by Hyfe will

be compared to the "gold standard" of human labeled continuous audio recordings. The coughs-person-hours will be compared using linear and Bland–Altman analyses.
Results: Our co-primary endpoints are hourly tabulations of time-stamped coughs based on two complementary units of analysis: individual coughs and cough-seconds (a second during which at least one individual cough occurs). Our preliminary pilot study with four research subjects and a total of 2832 coughs showed high correlation for both cough and cough-seconds, with a correlation of 0.91 and 0.90 and slopes of 0.76 and 0.79, respectively. Full results will be presented at the conference.
Conclusions: Our validation study will assess the accuracy and reliability of the Hyfe CoughMonitor system, with expected high correlation for both cough and cough-seconds. The system's AI-powered cough detection and quantification capabilities provide continuous and non-intrusive monitoring and has the potential to improve patient care, cough research and support drug development through continuous, more accurate and reliable cough monitoring.

Keywords: Cough monitoring, AI, Hyfe CoughMonitor.

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