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Digital Monitoring Could Create an Earlier Warning Window in Asthma

Ryan Quigley:
You're listening to ReachMD, and this is an *AudioAbstract*. I'm Ryan Quigley, and today, I'll be discussing preliminary results from the DIGIPREDICT study, which was presented at the 2026 European Respiratory Society International Congress in Barcelona.

For many patients with asthma, there's little warning before an attack becomes clinically apparent. Inflammation can build silently. Then, symptoms such as wheezing or coughing emerge, and patients reach for their rescue inhaler. But by that point, the opportunity for earlier intervention may already be narrowing. That's why the DIGIPREDICT study is exploring whether continuous digital monitoring could help create that missing warning window.

The study asks a practical question: can digital markers predict an asthma attack seven days ahead, and how does their performance compare with measures clinicians already use?

But before we answer that, let's review the study design. DIGIPREDICT is a prospective observational study in New Zealand. It enrolled 220 people with asthma aged 10 years and older, with 219 included in the updated analysis. The mean age was 37 years, and 15 percent were younger than 18. The investigators also intentionally oversampled Māori and Pacific peoples to support a more diverse real-world cohort.

Participants were followed for an average of 208 days, and the study captured several different signals. Smartwatches passively measured heart rate, activity, and sleep, while digital inhalers captured medication and inhalation patterns. Participants also provided peak-flow measurements and daily symptom reports, completed the Asthma Control Test every two weeks, and had nocturnal cough monitored.

But the broader DIGIPREDICT framework goes even further. As illustrated in the study overview, these patient-level signals can ultimately be considered alongside health-system and environmental data. And so the longer-term aim is to translate these inputs into an asthma exacerbation risk estimate and, in the study's second phase, a clinical risk score that could support alerts and provide information to the care team.

So, what did the investigators find?

Over an average follow-up of 208 days, participants generated more than 14,000 daily check-ins. Across the cohort, 450 asthma attacks occurred in 101 participants.

For seven-day prediction, the Asthma Control Test and smartwatch produced the strongest discrimination, and their performance was nearly identical. The area under the receiver operating characteristic curve was 0.658 for the Asthma Control Test and 0.654 for the smartwatch.

However, the smartwatch performed ahead of the other individual data sources. The corresponding values were 0.597 for the digital inhaler, 0.586 for peak flow, 0.573 for daily symptoms, and 0.568 for cough. And when F1 score and accuracy were considered together, the smartwatch provided the most balanced performance profile.

That distinction is clinically interesting because the smartwatch didn't clearly outperform the best traditional measure. Instead, passive physiologic monitoring performed about as well as the Asthma Control Test, without requiring patients to actively report how they're feeling. That suggests objective digital signals may eventually complement—rather than simply replace—established approaches to asthma monitoring.

Now, with all this being said, there are some important caveats to consider. Predictive discrimination in the updated models was modest. This is also an observational study of prediction rather than a trial showing that digital alerts prevent asthma attacks. And attrition was substantial, with 25 participants withdrawing and 40 lost to follow-up. Lastly, since the proposed clinical risk score and alert system represent a later phase of the research, their impact on clinical decision-making remains to be established.

Still, DIGIPREDICT points toward a different model of asthma care. Instead of waiting for symptoms to become obvious enough for a patient to react, passive monitoring could potentially identify changes earlier and create an opportunity for proactive assessment.

And so the next step is to determine whether combining these digital signals into a clinically useful risk score can provide enough warning to change management and, ultimately, prevent attacks. That's the key potential of this approach: turning continuously collected, passive data into an actionable warning window before an asthma attack occurs.

This has been an *AudioAbstract*, and I'm Ryan Quigley. To access this and other episodes in our series, visit ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!

Reference:

Chan AHY, Zhou Y, Wilson H, et al. Digital and traditional markers for predicting asthma attacks: preliminary results from the DIGIPREDICT study. Presented at: European Respiratory Society International Congress; September 5-9, 2026; Barcelona, Spain.