

Asthma attacks may be cut by half with digital tools

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Digital interventions that help people take their asthma medication better, such as "smart" inhalers or text messages, may cut the risk of asthma attacks by half, finds a new review of evidence led by UCL,

Queen Mary University of London, and University of Auckland researchers.

The new Cochrane Review paper found that digital interventions improve [medication adherence](#) by 15% and can yield a clinically-significant improvement in [asthma](#) control. The researchers say their findings support continued investigation of how to improve digital interventions so that they could be used more widely to help people manage their asthma.

Lead author Dr. Amy Chan (UCL School of Pharmacy and University of Auckland) said: "By pulling together evidence from numerous studies from around the globe, we have found that [digital tools](#) can help people to take their asthma medication more effectively, which subsequently improves their health.

"Asthma is the most common lung condition worldwide, affecting over 330 million people, and yet despite effective treatments many people are not taking their medications in the most optimal manner. We hope that digital tools can help to make it easier for people to manage their health."

For the paper, published by the Cochrane Library as part of the *Cochrane Database of Systematic Reviews*, the researchers reviewed evidence from 40 randomized controlled trials across more than 50 years of research on four continents, with data from over 15,000 adults and children with asthma. Study participants were using digital tools to support taking maintenance asthma medications for long-term control of symptoms and prevention of attacks.

The digital interventions under review included smart inhalers, or electronic adherence monitors, which can feed back information about medication use such as by tracking the time and date of dosing, or

monitoring if a person is correctly using their inhaler. Other tools included [mobile apps](#), SMS ([text message](#)) reminders and information alerts, or game-based approaches.

The researchers found that smart inhalers and text messages were more effective than the other types of digital interventions for improving medication taking, while interventions that included an in-person element also seemed to yield greater benefits for asthma control. However, the researchers caution that the strength of evidence was limited by the smaller number of studies looking at each specific [intervention](#).

The review authors say that the 15% improvement in [asthma medication adherence](#) they identified is likely to be clinically significant, particularly for people with low baseline levels of adherence.

The researchers found moderate evidence that people had much better [asthma control](#) when using digital supports. They found that digital tools reduced the risk of asthma attacks by roughly half, although the quality of evidence was judged to be low and the improvement could range from 32% to 91%. There was some evidence suggesting that digital interventions might improve quality of life.

Co-author Dr. Anna De Simoni (Asthma UK Center for Applied Research, Barts and The London School of Medicine and Dentistry, Queen Mary University of London) said: "The evidence in this review gives me, as a practicing GP, more confidence in discussing apps and other digital tools with my patients. With further research to identify the best way of using digital supports, we hope to continue helping people with asthma to improve their health."

Co-author Professor Chris Griffiths (Asthma UK Center for Applied Research, Barts and The London School of Medicine and Dentistry,

Queen Mary University of London) said: "Our review suggests that rolling out electronic adherence monitors—such as smart inhalers, and text messages, will make it easier for people with asthma to take their [medication](#) more effectively—and enjoy healthier lives."

The review also found that digital support tools tend to be highly acceptable to users, though more data are needed. The included studies did not have sufficient data on the effect of the digital tools on time off school or work or cost-effectiveness, and the researchers caution that their confidence in the evidence was reduced by risk of bias and inconsistency between the studies.

Dr. Erika Kennington, Head of Research & Innovation at Asthma + Lung UK, welcomed the report but stressed that more research was needed to understand which tools would work for which patients.

She said: "It's great to see the evidence that digital interventions improve adherence however it is simplistic to suggest that one tool will work for every single person with asthma or that one type of [tool](#) will work best for everyone. Furthermore, it is important to focus on finding tools for those who struggle with their asthma the most, with the emphasis being on patient needs and not only clinician needs."

More information: Amy Chan et al, Digital interventions to improve adherence to maintenance medication in asthma, *Cochrane Database of Systematic Reviews* (2022). [DOI: 10.1002/14651858.CD013030.pub2](https://doi.org/10.1002/14651858.CD013030.pub2)

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