

# Study shows digital device can improve patients' asthma management

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A new international study led by RCSI University of Medicine and Health Sciences has revealed significant potential for digital technology to improve asthma control for patients.

The study, published in *The Lancet Respiratory Medicine*, examined the effectiveness of combining information from digital device in a [digital platform](#) to effectively manage [uncontrolled asthma](#). The findings, which on average led to a health care cost reduction of \$3,300 per patient, demonstrate the future potential of digital medicine in the management of many chronic diseases.

Asthma is one of the most prevalent chronic respiratory conditions, affecting hundreds of millions of people worldwide. Steroid medicines can effectively treat and manage asthma, if delivered into the airways efficiently and in a timely manner using an inhaler. About one in 10 people with asthma find they cannot control their asthma symptoms with inhalers, however, often experiencing severe attacks or needing stronger medication. It is thought that in some of these cases, [patients](#) may not be using the inhalers effectively.

To assess this, doctors typically have had to rely on patients' own reports about their inhaler use and symptoms to adjust medications. Now, novel technologies developed by the INCA Research Team at RCSI can deliver and monitor asthma care in a completely digital manner.

The Inhaler Adherence in Severe Unstable Asthma (INCA-SUn) study, led by the INCA Research Team, involved more than 200 patients with severe or difficult-to-control asthma at 10 centers across Ireland, Northern Ireland and England. Half of participants (the "control" group) were monitored using traditional methods while the remaining participants (the "active" group) had their inhaler use monitored by a device called an INCA.

Co-developed by RCSI and Trinity College Dublin, the INCA device provides an objective assessment of how patients use their inhalers, by measuring acoustic or sound-wave signals from the inhaler. The data is provided to the patient's healthcare provider through a digital clinical

decision platform which advises the [best treatment](#), which may include educating the patient on effective inhaler technique.

The study revealed that patients assigned to the "active" group improved their medication adherence and were less likely to require corticosteroids, thus avoiding potential side effects. Fewer were switched to more expensive biologic medications, with a larger proportion of patients having their medication levels reduced while still controlling their symptoms effectively.

INCA Lead Investigator Professor Richard Costello, described how the 32-week study showed that the INCA devices can help to differentiate between people who have severe asthma and those who have difficult-to-treat [asthma](#), which is one of the challenging distinctions that respiratory physicians often need to make.

"This means that the digital monitoring technology can help doctors decide with more confidence which patients would benefit from a step up to biologic drugs, as opposed to continuing high-dose inhaled corticosteroid therapy alone.

"In this trial, which we believe to be the first of its kind, we have brought a completely digital approach to medication management and we believe that this is a substantial step towards improving the outcomes and [economic burden](#) in patients with severe and difficult-to-control symptoms," said Professor Costello, who is a Professor at RCSI Department of Medicine and a Consultant Physician at Beaumont Hospital.

**More information:** Elaine Mac Hale et al, Use of digital measurement of medication adherence and lung function to guide the management of uncontrolled asthma (INCA Sun): a multicentre, single-blinded, randomised clinical trial, *The Lancet Respiratory Medicine* (2023). [DOI:](#)

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