*Cochrane Database of Systematic Reviews - - Cochrane Review*

# Digital technology for monitoring adherence to inhaled therapies in people with cystic fibrosis

**Code:** CD013733 **Year:** 2023 **Date:** 2020 - updated: 9 NOV 2021 **Author:** Smith S

## Study design (if review, criteria of inclusion for studies)

randomised controlled trials (RCTs) looking at the effects of a digital technology for monitoring adherence of children and adults with CF to inhaled therapies

## Participants

Patients with CF

## Interventions

Digital technology

## Outcome measures

Adherence to inhaled therapies and health status

## Main results

We included two studies in our review, with 628 participants aged five to 41 years. There was one study each for two different comparisons. Nebuliser target inhalation mode versus standard inhalation mode - The included parallel study was carried out over 10 weeks after a runâ€•in period of four to six weeks. The study compared the effects of a digitally enhanced inhalation mode (target inhalation mode) for nebulised antibiotics compared to standard mode in children attending a regional CF clinic in the United Kingdom. The study's primary outcome was the time taken to complete the inhaled treatment, but investigators also reported on adherence to therapy. The results showed that there may be an improvement in adherence with the target inhalation mode when this intervention is used (mean difference (MD) 24.0%, 95% confidence interval (CI) 2.95 to 45.05; lowâ€•certainty evidence). The target inhalation mode may make little or no difference to forced expiratory volume in one second (FEV1) % predicted (MD 1.00 % predicted, 95% CI â€•9.37 to 11.37; lowâ€•certainty evidence). The study did not report on treatment burden, quality of life (QoL) or pulmonary exacerbations. eNebuliser with digital support versus eNebuliser without support - One large multicentre RCT monitored adherence via dataâ€•tracking nebulisers. The intervention group also receiving access to an online webâ€•based platform, CFHealthHub, which offered tailored, flexible support from the study interventionist as well as access to their adherence data, educational and problemâ€•solving information throughout the 12â€•month trial period. We graded all evidence as moderate certainty. Compared to usual care, the digital intervention probably improves adherence to inhaled therapy (MD 18%, 95% CI 12.90 to 23.10); probably leads to slightly reduced treatment burden (MD 5.1, 95% CI 1.79 to 8.41); and may lead to slightly improved FEV1 % predicted (MD 3.70, 95% CI â€•0.23 to 7.63). There is probably little or no difference in the incidence of pulmonary exacerbations or QoL between the two groups.

## Authors' conclusions

Digital monitoring plus tailored support via an online platform probably improves adherence to inhaled therapies and reduces treatment burden (but without a corresponding change in QoL) in the medium term (lowâ€• and moderateâ€•certainty evidence). In a shorter time frame, technological enhancement of inhaling antibiotics may improve adherence to treatment (lowâ€•certainty evidence). There may be little or no effect on lung function with either intervention, and online monitoring probably makes no difference to pulmonary exacerbations. Future research should assess the effect of digital technology on adherence in both children and adults. Consideration of adherence to the total treatment regimen is also important, as an improvement in adherence to inhaled therapies could come at the cost of adherence to other parts of the treatment regimen.

https://doi.org/10.1002/14651858.CD013733.pub2

## See also

Smith S, Calthorpe R, Herbert S, Smyth AR. Digital technology for monitoring adherence to inhaled therapies in people with cystic fibrosis. Cochrane Database of Systematic Reviews 2023, Issue 2. Art. No.: CD013733. DOI: 10.1002/14651858.CD013733.pub2

## Keywords

Adolescent; Adult; information; non pharmacological intervention - psyco-soc-edu-org; Self-Management; Psychoeducation; Behavioural interventions;