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A case study on the impact of Artificial Intelligence supported spirometry in primary care

Spirometry, Asthma - diagnosis, COPD - diagnosis

C. Adams[1], **E. Smets**[2], **J. Maes**[2], **J. Rees**[3], **M. Topalovic**[2]

[1]**Health Innovation Network - North-East and North Cumbria (United Kingdom),** [2]**ArtiQ - Leuven (Belgium),** [3]**School of Psychology, Faculty of Health Sciences and Wellbeing - University of Sunderland (United Kingdom)**

Background:

Spirometry is a key test to identify respiratory diseases. However, long waiting lists are present throughout England, with an estimated backlog of 200 –250 patients per 500.000. Moreover, poor quality of spirometry data and a lack of confidence when interpreting spirometry in primary care further drive suboptimal use. This study aims to investigate the impact of providing ArtiQ.Spiro, i.e. AI-based software to support primary care practitioners in performing and interpreting spirometry.

Methods:

Two ARTP-accredited healthcare professionals, a general practitioner and a nurse, used ArtiQ.Spiro over 5 months. They evaluated spirometry quality and made a diagnostic interpretation first without the ArtiQ.Spiro software and then with AI support. For each, they recorded (i) the time it took to interpret the test, (ii) how confident they were in their interpretation.

Results:

51 spirometry sessions were collected. The average time to evaluate the spirometry results decreased by using ArtiQ.Spiro from 10.6 ± 4.1 min. to 5.6 ± 5.6 min ($p<0.001$). The confidence level in the interpretation did not change, with a median of 4 on a 5-point Likert scale without and with AI support. The AI matched the quality assessment in 94% of the cases and matched the diagnosis in 86% of the cases (4% missing data). The final diagnosis needed further clinical consideration.

Conclusion:

This study shows that AI has the potential to reduce the time for interpretation of spirometry traces and support healthcare professionals in the execution and interpretation of spirometry. This could improve access to spirometry services.