County Durham Community Respiratory Nursing Service: Service Restructure, Skill Mix and Artificial Intelligence (AI) supporting community diagnostic spirometry

Nichola Hayes[1], Elena Smets[2], Marko Topalovic[2]
(1) CDDFT Community Services (2) ArtiQ, a Clario company, Leuven, Belgium
nichola.hayes@nhs.net; elena.smets@clario.com

Context

County Durham challenges:

- Increasing demand for accurate, accessible diagnostic spirometry across community services
- Workforce challenges & Delays in care

The local community respiratory nursing service **redesigned** its model to:

- **Increase capacity and workforce satisfaction** through revised skill mix
- **Maintain clinical** quality through whole service consultation and Integrating artificial intelligence (AI)

Hypothesis

AI can safely and effectively support diagnostic delivery by lower-band staff, enabling sustainable and scalable respiratory care in the community.

Methodology

Qualitative comparison between Band 3 and Band 6/7 performance and interpretation.

A survey, co-developed with the CDDFT patient experience team, collected feedback from primary care clinicians on the usability and quality of AI-supported spirometry.

Traditional Spirometry delivery at CDDFT

Spirometry performed and interpreted by **Band 6/7** Association for Respiratory Technology and Physiology (ARTP) certified Respiratory Nurse Specialists → Significant strain on the workforce →

- Staff resigned
- Sickness increased
- Service delayed
- Waiting list increased

Revised Service Model

Spirometry performed by **Band 3 Respiratory Care and Support Workers** (C&SW) received spirometry training, endorsed by Integrated Care Board (ICB)

C&SW +

Annual competency assessments supported quality assurance, with Band 6/7 ARTP certified nurse's interpreting. →

ARTP standard spirometry + **AI-assisted interpretation** (ArtiQ.Spiro)

Supervised by Band 6/7 ARTP certified staff

Effects of Changes

Appointment times were reduced from 60 to 45 minutes → **Increased testing capacity** from 300 to over 375 tests per month →

- Releasing 206 clinical hours at Band 6/7
- Releasing 90 hours at Band 4

Patient waiting times and backlog volumes are declining, with full resolution anticipated within eight months.

Impact on the service:

- The service currently has zero vacancies,
- 3 percentage points decrease of sickness absence
- Morale is high.

Feedback from Survey

40% Doctors
37% Practice nurses
11.5% Nurse practitioners
11.5% Other
9% holds ARTP accreditation
49% feels uncomfortable interpreting spirometry

33% found the AI generated disease suggestion slightly useful
40% sometimes used AI to influence their decision making
32% felt extremely confident or confident with the accuracy of the AI report
20% agreed AI saved them time

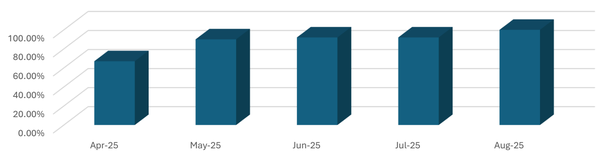
Only 17% felt satisfied with the AI service as compared to the previous nurse-led model

→ nurse led service is preferred to AI as included history and examination plus considered diagnosis plus treatment advice, however, proved unsustainable and not best use of clinical resource

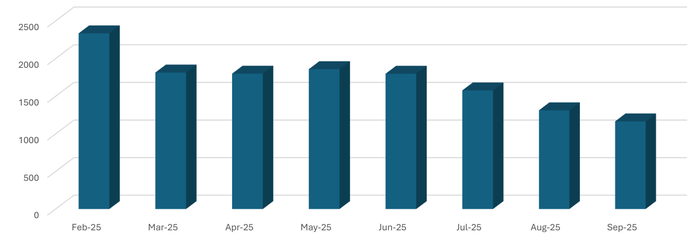
→ Additional training and support needed on how to interpret the AI reports

Results

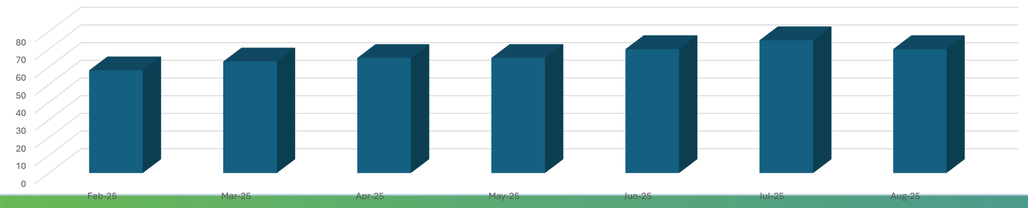
AI Quality Check: Median 92% accurate interpretation report.



Declining Spirometry Waiting List



Over 20% productivity increase per 1.0 whole time equivalent



Conclusion

Performing ARTP standard diagnostic spirometry by band 3 care and support workers with AI interpretation, supervised by ARTP respiratory specialist nurses:

- Provides a sustainable, productive, efficient, safe, clinically assured service model.
- Robust AI accuracy.
- Improved patient experience and organisational reputation through reduced waiting lists
- Survey showed nurses and doctors prefer nurse-led service, providing diagnosis plus treatment advice. Additional training to be provided to support interpretation of AI reports.