



Improving Asthma Care: Introducing FeNO Testing at Point-of-Care

A Quality Improvement Project Increasing Point-of-Care FeNO Testing for Paediatric Asthma in Primary Care

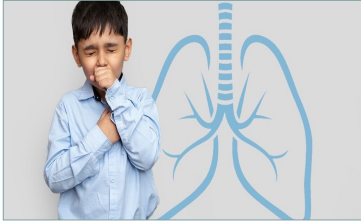
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Quality Improvement Project: December 2025 – March 2026



BACKGROUND



Asthma is one of the most common chronic conditions of childhood, causing substantial preventable morbidity, hospital admission and mortality in the UK. Robust, objective diagnosis is central to management, yet many children are still treated empirically without confirmatory testing.

Fractional exhaled nitric oxide (FeNO) is a non-invasive breath test measuring airway inflammation. BTS/SIGN/ NICE (NG245) recommend it as a first-line objective test supporting asthma diagnosis in children, alongside spirometry and clinical history - yet primary care uptake remains inconsistent nationally.

In Northern Ireland, FeNO access is largely confined to centralised hospital hubs, delaying diagnosis and removing the opportunity for point-of-care decision-making in general practice.

This project introduced point-of-care FeNO testing within a primary care practice to improve access, increase uptake, and support faster, more accurate diagnosis and treatment.

Culture, Context & Local Barriers

Nationally, NI asthma outcomes remain among the poorest in the UK, with low objective-testing uptake in children. Locally, shared FeNO machines exist but are not held by individual practices, delaying access.

Process mapping identified further barriers: limited device access, low staff awareness of indications and interpretation, and low patient/parent understanding of FeNO. Some parents associated testing with spirometry and were reluctant; some clinicians were unaware a FeNO pathway existed.

Project Aim (SMART)



Within 3 months, increase the proportion of 6-11 year olds with suspected/confirmed asthma undergoing FeNO testing from 0% to 20%.

This balanced ambition with feasibility given 0% baseline uptake, staff unfamiliarity, and limited clinic capacity. A stepwise approach was taken, allowing early success to drive engagement and sustainability.



DISCUSSION: STANDARDISATION, SUSTAINABILITY & SPREAD

Standardisation

Following successful PDSA testing, the pathway was standardised via a defined SOP, EMIS workflow and NICE-aligned thresholds. This ensured consistent delivery by any clinician, not just those involved in the QI project.

Documentation & Sustainability

FeNO was embedded into the asthma pathway and EMIS 'Asthma Review Template', aligned with existing review clinics; the SMS recall process was retained to minimise workload. Ongoing education, a practice champion, and dashboard monitoring support long-term uptake.

Limitations & Reflections

This project used a loaned device in a single practice over 3 months; results may not fully generalise. Diagnostic yield (53% elevated FeNO, n=19) was encouraging but reflects a small sample; longer follow-up is needed to confirm accuracy and prescribing change.

References

- Asthma + Lung UK (2026) What is asthma? asthmaandlung.org.uk (Accessed 21 Mar 2026).
- NICE (2024) Asthma: diagnosis, monitoring and chronic asthma management (NG245).
- National Review of Asthma Deaths (2014) Why asthma still kills. RCP.
- RCP (2022) National Asthma and COPD Audit Programme (NACAP) report.
- Whittaker, H. et al. (2025) Incidence/prevalence of asthma, COPD & ILD 2004-2023. Thorax.



METHODS

A structured QI approach used process mapping, root-cause analysis and iterative PDSA cycles. A driver diagram translated the SMART aim into three primary drivers: staff engagement, patient engagement, and workflow integration.

Root-Cause Analysis

A fishbone diagram identified three domains driving low uptake: staff/patient awareness; workflow and system limits (no FeNO EMIS code, scheduling difficulty); and equipment access - showing the problem was structural, not just educational.

Staff Awareness

Limited education on indications; clinical uncertainty when FeNO conflicts with spirometry results

Patient Awareness

Low parent understanding of FeNO; some assumed it required effortful technique, as with spirometry

Equipment & Access

No dedicated practice device; limited testing kits; no ring-fenced funding for equipment

Workflow & Systems

No FeNO code on EMIS; difficulty scheduling within existing consultations

EFFECT: 0% FeNO Uptake (baseline)

Driver Diagram

AIM: 0% → 20% FeNO uptake in 6-11yr olds, 3 months

Staff Engagement & Knowledge

- Staff education session
- Consultation room reminders
- Email prompts to clinicians

Patient ID & Engagement

- EMIS asthma search tool
- SMS recall & education
- Dedicated FeNO clinic slots

Workflow Integration

- FeNO EMIS code created
- Results documented consistently
- Built into asthma review

Measures

Outcome, process and balancing measures tracked progress and unintended impact.

Outcome: proportion of eligible children tested.

Process: staff trained; patients SMS-contacted; posters displayed practice-wide.

Balancing: workload impact on Respiratory Nurse, admin team and review clinic time.



BASELINE & PDSA CYCLES

Baseline Data Collection

An EMIS-based 'Asthma Dashboard' identified all patients aged 6-11 with diagnosed or suspected asthma.

77

Eligible patients

0%

Baseline uptake

Baseline data confirmed 0% of the eligible population had undergone FeNO testing prior to any intervention.

PDSA Testing Cycles

Three sequential PDSA cycles tested distinct, iterative interventions to increase FeNO uptake, each building on the learning from the cycle before it.



PDSA 1 · STAFF EDUCATION

17 Dec 2025 - 17 Jan 2026

Plan: staff education session on FeNO indications & technique; predicted ~4 patients tested in 1 month.

Do: 8 staff attended (limited by illness/scheduling); engaged, asked questions.

Study: 2 patients tested (50% of predicted) - lower attendance and winter effects likely responsible.

Act: avoid holiday scheduling; repeat sessions; adjust predictions; shift to direct patient contact.

PRED 4

ACTUAL 2

50% of predicted uptake achieved



PDSA 2 · SMS INVITATION

19 Jan - 19 Feb 2026

Plan: SMS to eligible patients with FeNO education & booking info; predicted 6 additional patients.

Do: SMS sent as planned; rapid positive response; extra clinics arranged.

Study: 10 patients tested (167% of predicted) - direct engagement far more effective than education alone.

Act: continue SMS + posters; ensure clinic capacity; refine messaging; consider automated recalls.

PRED 6

ACTUAL 10

167% of predicted uptake achieved



CYCLE 3 & RESULTS



PDSA 3 · EDUCATIONAL POSTERS

20 Feb - 20 Mar 2026

Plan: educational poster with FeNO info & booking details; predicted 3 further patients.

Do: poster approved; 15 copies displayed in waiting areas & consult rooms.

Study: 7 patients tested (233% of predicted) - low-cost visual cues meaningfully boosted uptake.

Act: continue posters long-term; explore digital screens & GP prompts.

PRED 3

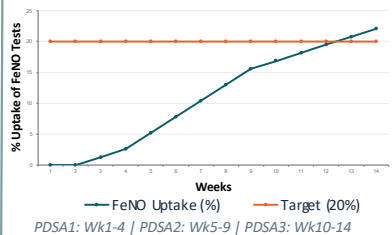
ACTUAL 7

233% of predicted uptake achieved

Results

FeNO uptake rose from 0% to 22% over 3 months, surpassing the 20% SMART target (110% of goal). Uptake was slowest in Cycle 1, accelerated sharply in Cycle 2, and was sustained steadily in Cycle 3. No adverse impact on nursing/admin workload or clinic time was reported.

Cumulative FeNO Uptake vs. Target



Number of FeNO Tests per Week



0% → 22%

20% SMART target surpassed in 3 months.

19

children

tested

53%

had elevated

FeNO

100%

normalised with

Tx

Of the 19 children tested, 53% had an elevated FeNO result; all normalised on repeat testing following diagnosis and treatment. No adverse impact on Respiratory Nurse/admin workload or asthma review time was reported.



CONCLUSION

Over 3 months, point-of-care FeNO testing was successfully introduced and sustained within a primary care practice using a loaned device, without pre-existing infrastructure or dedicated funding - demonstrating feasibility, clinical usefulness in real-time decisions, strong patient engagement, and improved quality of diagnosis and treatment. FeNO uptake among eligible 6-11 year olds increased from 0% to 22%, surpassing the original 20% SMART target.

The practice is now in active discussion regarding permanent FeNO provision.

Acknowledgements & Contact

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