

FeNO Implementation F.A.Qs

Fractional exhaled nitric oxide (FeNO) is a measure of the nitric oxide in an exhaled breath. Exhaled nitric oxide is raised when eosinophilic inflammation is present in the lungs and so we can use it to identify patients who will benefit from inhaled corticosteroids, which treat inflammation.

A FeNO machine is a small, portable, device which measures the nitric oxide a patient exhales. It is simple to set up and clean, fast to use and training is freely accessible.

Here are some questions you might have about using FeNO in practice to help you make decisions about whether to implement FeNO testing in your practice or PCN.

What impact will getting a FeNO machine have on my patients?

In line with the new NICE (2024) guideline FeNO testing presents an opportunity for patients with suggestive clinical history and symptoms to get a confirmed asthma diagnosis from a single appointment in primary care.

- ✓ The test is quick and comfortable to perform with FeNO taking about 10 minutes to do with a patient unfamiliar with it.
- ✓ Having a FeNO test in practice will improve asthma diagnosis and can be done quickly alongside peak flow variability (calculated as peak flow amplitude mean) and full blood count to check for raised blood eosinophil count.
- ✓ FeNO can also be used to identify patients who are at higher risk of asthma attack and poor asthma control.

This means as well as diagnosing asthma faster, when you are reviewing patients already on moderate dose maintenance and reliever therapy you can use FeNO alongside full blood count, to identify who to refer to specialist services and who to trial montelukast or a long-acting muscarinic antagonist (LAMA) inhaler. FeNO can also be done alongside spirometry but should be done first as forced spirometry manoeuvres may temporarily increase the FeNO reading.

How is the test done?

The test is simple; the machine is portable and ready to use after being plugged in. When it is first turned on a FeNO machine will take up to 3 minutes to sense the background levels of nitric oxide in the air. A mouthpiece (single patient use) is then attached, and patients are asked to blow at a steady flow rate into the mouthpiece for 10 seconds. Once the breath is finished the result appears on screen as a value of parts per billion e.g. 50ppb.

What training is needed for staff to perform and interpret the test?

Manufacturers will typically provide machine specific videos and information in the machine manual, all of which is very short and straightforward. We recommend the [e-learning](#) available on eLearning for Health which takes about 30minutes and covers performance and interpretation of FeNO. There are no portfolios, external training courses or periods of supervision necessary!

How do I maintain the machine?

Between patients wiping the handheld parts with a clinical wipe and disposing of used mouthpieces in the clinical waste bin is important. You do not need to consider additional ventilation above usual clinic requirements as FeNO testing does not use a forced breath and generally does not provoke cough. Depending on the device you choose servicing once yearly may be required and this should be a consideration when choosing the device.

How much will a FeNO Machine cost me?

As well as purchase cost of the machine there are a few other costs to consider.

Item	Approximate pricing
Machine	£2,994.00- £5,900
Servicing	£150
Mouthpiece (single patient use)	£4.00-£8.00

Some FeNO companies allow a practice to rent a machine, sometimes on the understanding they will buy a set number of mouthpieces per year for a fixed number of years. This option tends to be cheaper. Mouthpieces come in boxes of 50 or more usually and bulk purchasing can be cheaper if you will use higher numbers of them.

Lifespan of FeNO machines is typically 5 years after which they may need to be refurbished or replaced. Be sure to ask manufacturers about options when considering buying a FeNO machine.

Limitations of FeNO testing?

FeNO is not a test designed for screening and so while it is useful to add an objective measure of airway inflammation supporting clinical diagnosis of Asthma and meeting QOF and NICE recommendations for diagnosis it has limitations. In a person without clinical history and symptoms suggestive of asthma a FeNO result doesn't mean much. It is also better at ruling in asthma than at ruling it out which is why when FeNO is negative but clinical history and symptoms suggest asthma patients should typically be offered

further testing which could be blood eosinophil count, Peak flow variation monitoring or spirometry.

FeNO is falsely lowered in smokers and is likely not to be a useful test in this group. FeNO can be elevated by physical exertion, eating leafy greens, drinking hot drinks, caffeine and alcohol. It is useful to give patients information beforehand to ensure they have the best chance of getting an accurate test, this [patient information leaflet](#) is one resource you could use to do this.

Finally, even if a patient has a high FeNO, if symptoms do not respond to asthma treatment or there is high clinical suspicion of a different underlying cause patients should have further investigation and if appropriate be referred for specialist opinion. FeNO is not useful in children under 5 years of age and some machines are only licensed for use in ages 7 and above.

How do I make the case for FeNO?

Asthma and Lung UK (2023) have reported up to 30% of asthma diagnosis may be inaccurate and by using FeNO as part of your primary care diagnostic pathway diagnostic accuracy is increased. FeNO accuracy is highly predictive of asthma with Sensitivity: 88% and Specificity: 79% when paired with history and symptoms suggestive of asthma (Schneider, 2022). The National Institute for Health and Care Excellence (NICE) now recommend FeNO as a first line diagnostic test for asthma in children over 5 and in adults (NICE, 2024).

Undiagnosed asthma has a multitude of costs, consider appointments, medication and cost of problems occurring where diagnosis is delayed or control is suboptimal. Outside of the direct cost and time impact on practice the burden of undiagnosed asthma and poor asthma control can be seen as missed days of school or work for patients and use of urgent care and emergency services.

If you are looking at bidding for FeNO funding across a larger service you might want to make use of the fantastic [PCRS FeNO 'Plan on a Page' resource](#) by Dr Sanjeev Rana.

How do practices and PCNs use FeNO?

FeNO is a useful point of care test that practices use to reduce appointments needed to diagnose asthma and to address the problem of variability (tests for asthma tend to be positive only when symptoms are active). This means patients do not face a delay in diagnosis because of clinicians appropriately starting treatment as the test can be done at point of care.

Case Studies of FeNO Use

FeNO SAPA5 'We set up a FeNO testing service in our PCN run in the out of hours appointment hub and staffed by nurse associates and health care assistant's. We have so far had around 130 patients through the services from Jan - July 2025. We are hopeful that access to this timely and easy to access diagnostic service will improve their asthma diagnosis and management, leading to better health outcomes for our population.'

FeNO Royston Group Practice 'In Royston Group Practice FeNO has been used as part of standard nurse respiratory clinics to aid decision making. Victoria Martin who is a Practice Nurse and a Respiratory Champion in SY has used this opportunity to look at quality improvement and has measured impact of FeNO on individual patients. Victoria has demonstrated that FeNO can be helpful in determining new diagnosis but majority of uses in her clinic were done to guide stepping up treatment. 36% of patients with poor symptom control had an associated high FeNO (above 50ppb) and were appropriately stepped up in their asthma treatment or referred. Another 30% of symptomatic patients did not have a raised FeNO and in these patients Victoria was better able to use investigations to consider additional pathologies such as COPD and could step up appropriately to LAMA or LRTA. Victoria is pleased to have the resource of a FeNO machine in practice and feels it has supported her to provide better care for patients.'

References and Resources

ALUK (2023) Diagnosing the Problem: Right test, right time. Online. Available from: <https://www.asthmaandlung.org.uk/diagnosing-problem-right-test-right-time> Accessed 11th August 2025.

PCRS (2021) FeNO testing in primary care – are we nearly there yet?. [online] available from: <https://www.pcrs-uk.org/resource/current/guide-feno-testing> Accessed 01 August 2025.

PCRS (2019) Consensus Guide to FeNO Testing in Asthma Diagnosis. [online] Available from: <https://www.pcrs-uk.org/resource/current/pcrs-consensus-feno-testing-asthma-diagnosis> Accessed 13 August 2025.

PCRS (2025) Diagnosis of asthma in children and young people (CYP)[online] Available from: <https://www.pcrs-uk.org/resource/current/diagnosis-asthma-children-and-young-people-cyp> Accessed 08 September 2025

Dr Sanjeev Rana (2025) A Personal Perspective on using the Plan-on-a-Page tool to support the development of FeNO services [online] Available from: <https://www.pcrs-uk.org/resource/current/feno-plan-page> Accessed 01 September 2025.

Schneider, Antonius et al. (2022) Diagnostic accuracy of FeNO in asthma and predictive value for inhaled corticosteroid responsiveness: A prospective, multicentre study. [online] eClinicalMedicine, Volume 50, 101533 Available from: [https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370\(22\)00263-2/fulltext](https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(22)00263-2/fulltext) Accessed 01 September 2025.

Resources

E Learning for health FeNO e-learning

<https://learninghub.nhs.uk/Resource/51628/Item>

FeNO Patient Information Leaflet <https://www.england.nhs.uk/aac/wp-content/uploads/sites/50/2021/08/fractional-exhaled-nitric-oxide-feno-patient-leaflet.pdf>