

Introduction

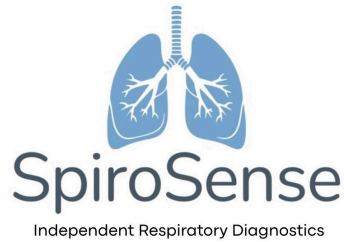
What is Fractional Exhaled Nitric Oxide (FeNO)?

A FeNO device is a small hand-held machine which can be used to measure the fractional expired Nitric Oxide (FeNO) levels in a single expired breath and provides an indication of the eosinophilic inflammation in the airways. FeNO measurement is not considered an aerosol generating procedure and it rarely induces cough. Alongside a detailed clinical history, examination, and other important tests to assess variability (peak flow, reversibility, and challenge tests) it can be used to support the diagnosis of asthma. A positive test increases the probability of asthma, but a negative test does not exclude asthma (PCRS, 2021). NICE guidance (2024) regards a positive FeNO level of 50 ppb in adults and 35ppb in children. FeNO only forms one element of the diagnostic process for respiratory diseases and should not be the sole basis of any diagnosis. Commencing any treatment, for example inhalers or onward referral should never be delayed due to lack of or access to FeNO testing.

Purpose

Why use FeNO testing?

NHS Primary Care Services are being asked to restore asthma registers and monitoring for adults and children, to pre-pandemic levels in 2022/23, as outlined in the Quality and Outcomes Framework (QOF). In addition to spirometry, FeNO can be used to support the diagnosis of asthma, as one of the minimum of two diagnostic tests required by QOF to confirm an asthma diagnosis and for that individual to be added to the asthma register. The National Institute for Health and Care Excellence (NICE), supports the use of FeNO testing alongside clinical assessment, spirometry, and peak flow as part of the diagnostic algorithm for adults with respiratory symptoms suggestive of asthma (NICE, 2024). Along with the British Thoracic Society and Scottish Intercollegiate Guidelines Network (BTS-SIGN, 2024) both support the use of FeNO as part of an assessment process where asthma is considered possible.



Scope

This policy applies to all employed registered nurses & HCAs. It also applies to other people who work at SpiroSense e.g., non-employed nursing staff

Responsibilities

- **Operations Director** – Is responsible for:
 - ensuring that the appropriate policies are in place and that robust monitoring arrangements are in place.
- **Nurse Leads** – Are responsible for:
 - Ensuring and monitoring compliance of the policy within areas of their control.
- **Registered Nurses** – Are responsible for:
 - Ensuring and monitoring compliance of the policy within areas of their control.
- **Non-registered practitioners** - Are responsible for:
 - Ensuring and monitoring compliance of the policy within areas of their control.

SpiroSense will ensure that all registered nurses, supervisors, managers, and employee representatives will be trained to enable them to apply the principles of this Policy within their roles and provide advice and guidance.

Implementation

FeNO testing - pre-test preparation

Where possible an information leaflet should be provided ahead of the FeNO appointment. Ahead of a FeNO test the individual must be instructed to:

- Avoid eating, drinking (hot drinks, caffeine, and alcohol) and smoking for at least 1 hour prior to their appointment
- Avoid any significant exertion or exercise for at least 1 hour prior to their appointment • Avoid nitrate rich foods such as celery, leek, beetroot, lettuce, spinach, or other green leafy vegetables, for at least 3 hours prior to their appointment.

When to undertake FeNO testing – inclusion criteria

- New presentation with intermediate probability of asthma (BTS-SIGN 2019) • New high probability of asthma - where if resources allow for this to be done without delay prior to commencing treatment(BTS-SIGN,2019, NICE 2017)
- Complex asthma patients e.g. Those not improving with treatment, possible poor compliance to medication and ongoing symptoms. These presentations should all be discussed with a respiratory lead nurse or GP prior to FeNO testing.

The following scenarios may also benefit from FeNO testing:

- To assist in assessing the aetiology of respiratory symptoms
- To help identify the eosinophilic asthma phenotype
 - To assess potential response or failure to respond to anti-inflammatory agents • To establish a baseline FeNO during clinical stability for subsequent monitoring • To monitor step-down/step-up dosing, or discontinuation of anti-inflammatory medications
- To assist in the evaluation of adherence to anti-inflammatory medications • Non-compliant patients where Feno may be used as educational tool

When not to undertake FeNO testing – exclusion criteria

- Children aged 5 or under, or those unable to provide a sustained 6-second blow • Those presenting with signs of viral infections such as Covid-19, flu, cold-virus • Those presentation with signs of an infective exacerbation such as a bacterial chest infection

Familiarising yourself with FeNO devices

Due to the slight variation between the makes of each machine it is essential that before use

those who are performing the FeNO test familiarises themselves with the specific product and model that they will be using. Instruction manuals and How-to-guides can be found on the suppliers' websites (see additional resources section for links)

Interpreting a FeNO test result

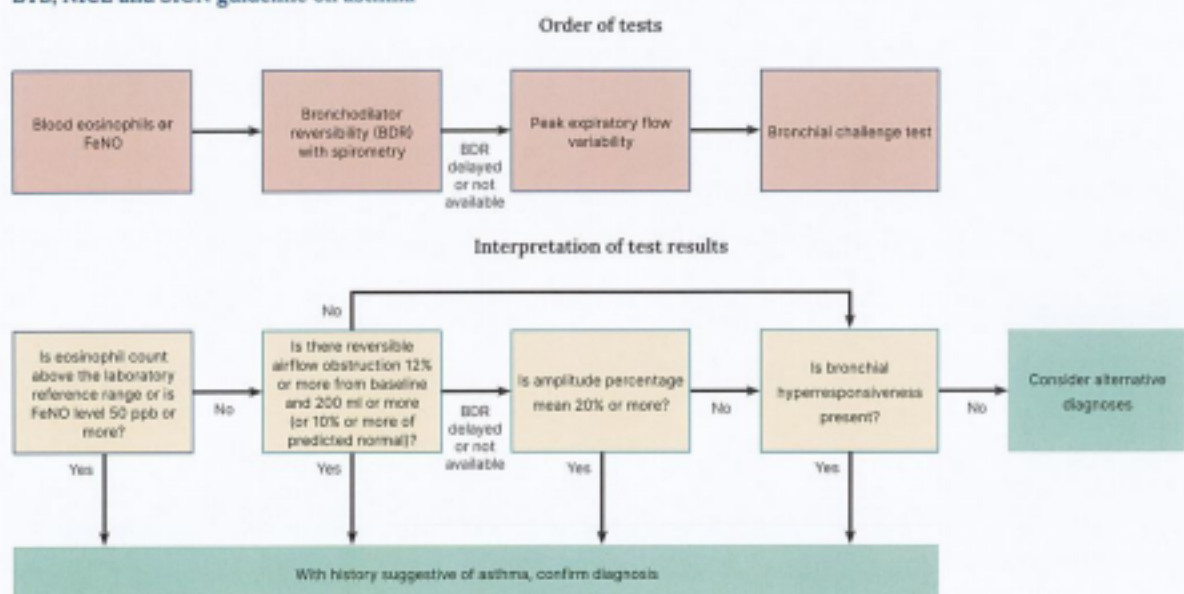
Interpretation of all FeNO tests should be undertaken by clinicians who are trained and competent in diagnosing asthma as well as have appropriate understanding of the value of FeNO in making a diagnosis (usually competence based).

When confirming an asthma diagnosis, FeNO test results should be considered in conjunction with a detailed clinical history, examination and additional tests assessing airways reversibility or diurnal variation. The following algorithm (NICE Asthma: diagnosis, monitoring, and chronic asthma management (2024)) can be used to guide the interpretation of test results from

Fractional Exhaled Nitric Oxide (FeNO)

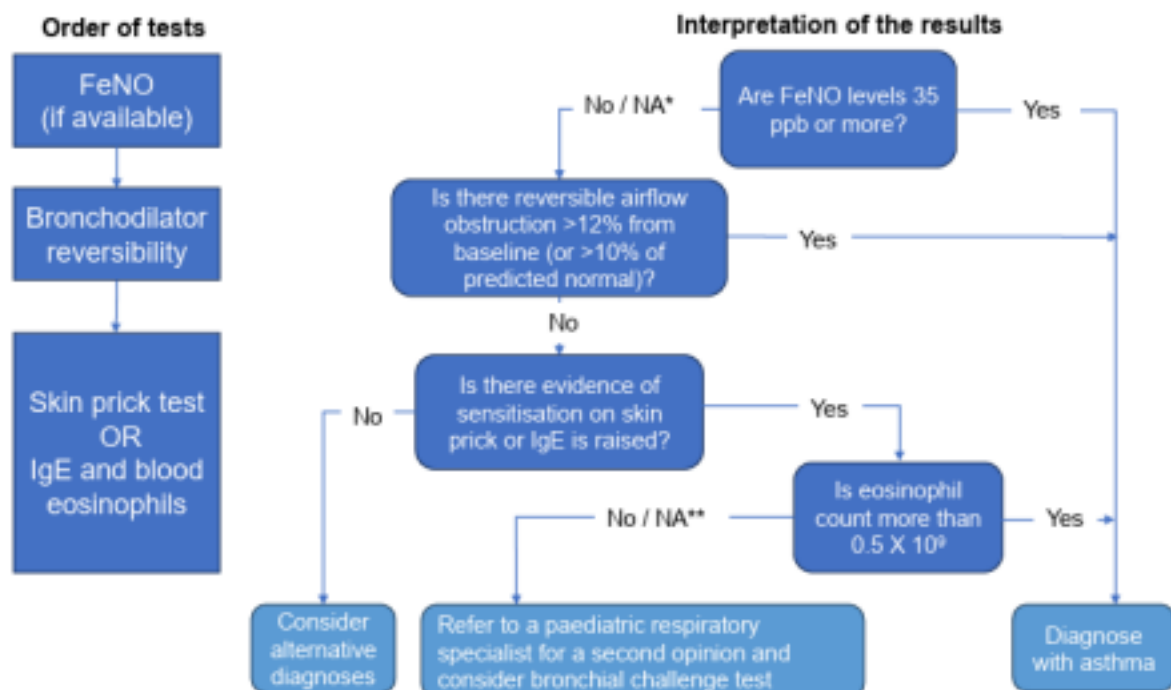
spirometry, FeNO and a completed peak flow diary. Alternative algorithms are available such as, for those under 17 years of age (see additional resources section).

Algorithm A: Objective tests for diagnosing asthma in adults and young people (aged over 16 years) with a history suggesting asthma
BTS, NICE and SIGN guideline on asthma



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This is a summary of objective tests for diagnosing asthma in children aged 5 to 16 from the draft guideline on asthma produced by BTS, NICE and SIGN. See the [draft guideline](#) for more details.



Additional considerations when interpreting a FeNO test result

There are several confounding factors requiring additional caution when interpreting FeNO results. The following additional factors could be influencing the FeNO test result so should also be considered and excluded prior to advising alternative care.

The following factors that may lower FeNO levels and therefore results should be interpreted with caution before changing asthma management or excluding an asthma diagnosis:

- Inhaled and oral corticosteroid treatments
- Recent hot drink, caffeine and alcohol consumption
- Cigarette smoking

The following factors that may **raise** FeNO levels and therefore results should be interpreted with caution before changing asthma management:

- sino-nasal disease such as allergic rhinitis
- a diet high in nitrate-rich foods such as leafy green vegetables
- an active respiratory tract infection

There are many other associations that have been made with a raised FeNO result that are non respiratory, most of which would have symptoms of other problems. In a population study of FeNO in people without known asthma less than 1/3 with raised FeNO levels had any evidence of

Fractional Exhaled Nitric Oxide (FeNO) SOP V1.0

respiratory disease (after further testing, reversibility spirometry, challenge testing, bronchoscopy, sputum eosinophil analysis, bronchoalveolar lavage and imaging).

Therefore, FeNO is not suitable as a general screening tool for the population and should only be undertaken when the result is likely to influence management.

Recording a FeNO test result

It is important to record all FeNO test results and add to patient report

Infection Protection Control considerations.

SpiroSense should ensure a consistent application of all current Infection Protection Control (IPC) measures, following both local and national guidance, and be able to provide assurance on their adherence. This would include room ventilation, social distancing, hand hygiene, environmental cleanliness, and use of appropriate Personal Protective Equipment (PPE). Check for the latest nationally available Coronavirus(Covid-19) updates and guidance and consult directly with your local IPC lead for support in applying the guidance. Each test requires the appropriate filtered mouthpiece. The mouthpiece can be used by the same individual for more than one attempt at testing on the same day, but a new mouthpiece is required for each visit.

Maintenance & cleaning of FeNO device

- All equipment should be part of the practices annual service schedule. • FeNO devices will need either annual calibration or annual sensor replacement depending on the manufacturer/brand, therefore practices must follow the relevant manufacturers guidance.
- All sensors, filters and other components within the device should be replaced according to the manufacturer's guidance, so as not to nullify the results gleaned from the testing. • Where appropriate check consumables such as mouthpieces and filters are "in-date" • External surfaces of devices should be cleaned with anti-microbial wipes that are non alcohol based.
- Do not allow battery to fully discharge.
- Avoid exposing the FeNO device to extremes of temperature i.e. do not leave in direct sunlight on windowsill, do not leave in car overnight.

Training and Competence

FeNO should be used as an additional tool to support the diagnosis of asthma by clinicians who are trained, confident and competent in the diagnosis of asthma. Training can be accessed as on line modules via E-learning for health and the training video supplied by the device manufacturer.

Fractional Exhaled Nitric Oxide (FeNO)

To assure that a clinician is deemed competent to perform quality assured FeNO testing this training and the acquired knowledge and skills attained should be assured by completion of an annual review at reviewed by the Lead Nurse.

It is each person's professional responsibility to ensure their knowledge is updated accordingly as part of his or her personal professional development plan.

Equality Impact Assessment

SpiroSense has made every effort to ensure this policy does not discriminate, directly or indirectly, against employees, patients, contractors, or visitors on the grounds of race, colour, age, nationality, ethnic (or national) origin, gender, sexual orientation, marital status, religious belief, or disability. This policy will apply equally to full and part time employees.

All SpiroSense policies are assessed for equality and impact.

Additional resources, FAQ's & References

<https://www.e-lfh.org.uk/programmes/feno-in-asthma/>

<https://www.nobreathfeno.com/us/>

<https://www.nice.org.uk/guidance/ng245/chapter/recommendations>

<https://www.pcrs-uk.org/resource/current/feno-patient-leaflet-multi-language>

[e https://www.pcrs-uk.org/resource/current/feno-sms-template-accurx](https://www.pcrs-uk.org/resource/current/feno-sms-template-accurx)

Fractional Exhaled Nitric Oxide (FeNO) SOP

Appendix

Example of competency template for undertaking FeNO testing

All staff must be trained in how to use their specific brand of machine AND able to evidence their completing FeNO training such as the online learning module (E-learning for health) and the associated assessments before deemed competent to perform quality assured diagnostic FeNO.

Below are some example competency elements you may wish to include in an observed FeNO competency assessment use for delivery of the test. A competency assessment should be conducted by a clinician experienced in FeNO testing. A minimum of five observed FeNO test is recommended to obtain competency

Name (clinician)						
	Observed test					
FeNo Competency Assessment	1	2	3	4	5	Comments
Observed correct preparation of FeNO device and all equipment required for safe practice.						
Confirms with patient the absence of contradictions to performing a FeNO test						
Provides clear explanation to patient of required technique for FeNO test						

Identify factors that may artificially increase or decrease FeNO test results		
Able to demonstrate how to add patient profile for specific FeNO device		
Observed ability to support patient to perform a valid FeNO test		
Discuss how FeNO testing can support in the diagnosis of asthma including the interpretation of results		
Discuss Infection Prevention & Control measures including clinic & device cleaning procedures		

Patient ID	Date	Comments	Signed
1.			
2.			
3.			
4.			
5.			

Review of Policy

This policy is reviewed annually or following changes to legislation or guidance. Legislation and guidance links are checked and updated as part of the annual policy review.

Last review date: 04/02/2026

Next review date: 03/02/2027