

GETTING THE BASICS RIGHT

Fractional Exhaled Nitric Oxide testing



Fran Robinson talks to Carol Stonham a nurse practitioner, PCRS-UK nurse lead and vice chair of the PCRS-UK Education Committee, who has been carrying out FeNO testing for asthma for a number of years in her practice, the Minchinhampton Surgery, Gloucestershire. Carol says the test is so useful that now she would find diagnosing and monitoring asthma much more difficult without it.

What is a FeNO test?

Patients with allergic airway inflammation generally have higher than normal levels of nitric oxide (NO) in their exhaled breath. By measuring the concentration of NO in exhaled breath (fractional exhaled nitric oxide or FeNO), clinicians can identify inflammation in the lungs.

Why you need to know about FeNO testing

NICE consulted on draft guidance for the diagnosis and monitoring of asthma¹ in January this year in which FeNO tests were recommended to help confirm the diagnose asthma in adults and children.

The draft guidance suggested that asthma should no longer be diagnosed on clinical symptoms or spirometry alone, or by a trial of steroids. It recommended spirometry as a first line of investigation and that a FeNO test should be offered if a diagnosis of asthma is being considered in adults and young people over the age of five.

The draft guidance also suggested that clinicians should use FeNO testing to help manage asthma in patients who continue to have symptoms despite being prescribed inhaled corticosteroids. The draft guidance has sparked considerable debate (see Chair's perspective page 8). Very few people use FeNO test currently, so we spoke to one person who has, Carol Stonham, to find out about its potential value in practice

Three reasons to take a FeNO measurement:

1: To assist in diagnosis

The FeNO test can help to diagnose airway inflammation and also determine when respiratory symptoms are not due to asthma.

Carol says: *"The problem with spirometry is that if patients are asymptomatic on the day they come in for the test, which measures obstruction in the airways, the result will be normal. The likelihood is they will still have some underlying inflammation and this is where the FeNO test is useful because it measures inflammation."*

"Taking a good, accurate clinical history is always the basis of suspecting an asthma diagnosis. However quite often the history is not straightforward – you think the patient has probably got asthma but it's not definite. In my experience it's those intermediate probability cases – about 60% of patients – where a FeNO test is really useful."

"I see it as being part of a jigsaw puzzle, it is not used on its own but is used in addition to other diagnostic criteria".

2: To aid treatment

The FeNO measurement can help the clinician to determine the likelihood of steroid responsiveness and can guide stepwise changes in anti-inflammatory medication: step-down dosing, step-up dosing, or discontinuation of treatment.

If a patient on a low dose inhaled steroid becomes symptomatic and compliance and inhaler technique have been checked, a FeNO test can be used to indicate whether they need more anti-inflammatory therapy.

Likewise a FeNO measurement can help the clinician assess whether to step down treatment. Carol says: *"We don't step patients down as often as we should – we are notoriously bad at doing that. There are many reasons why we don't: we don't have the confidence"*

to do it; we don't know when to do it; we are not really sure how to do it; patients don't want to do it because they feel well - and those are all given, but not valid reasons. But high doses of medication are expensive and come with side effects for patients so we should step patients down when we can.

"If you have a patient whose asthma is under control: they have had at least three months when they have been really well, have not been using their rescue inhaler, have had no symptoms and are functioning well i.e. they are not reducing their activity and are not awake at night, then this could be a good time step them down.

"The beauty of the FeNO test is that it can help to reassure them that stepping down treatment is beneficial. You can do a test and give the patient a measurement then call them back a few weeks later and do another test to show them that the level of inflammation is not rising."

3: To identify poor adherence to treatment

The FeNO test can also help to determine whether patients are adhering to their prescribed corticosteroid treatment.

Carol explains: *"If a patient's FeNO level is rising and they are on a reasonable dose of steroid it's a good way of opening a conversation about inhaler technique or to ask them about how they are taking their medication. If they are not taking medication as prescribed, they will usually be happy to chat about it, especially when the raised FeNO level is suggesting something is amiss. Usually a four second break in the conversation is enough space for a patient to feel they need to 'confess' . . .*

"So if you have got a patient who isn't on board with their care you can use the FeNO test measurements to show that treatment can make a difference over a short period of time. Their FeNO measurement can drop from 68 to 32 in a matter of a couple of weeks, the patient starts feeling better and that helps them to grasp the concept that their treatment works. Patients also like it because they have a figure that they can see is improving."

How do you carry out a FeNO test?

A FeNO device is a hand held machine which requires a 10 second blow at 60 Litres a minute. It works like an alcohol breathalyser giving the results on the spot.

The patient first breathes out into the air to ensure any atmospheric nitric oxide (NO) is eliminated. They then seal their lips around the mouthpiece of the machine, take a full breath in and blow back out again into the machine. This then gives a clean measurement of NO in the exhaled breath. The patient is guided to breathe at the right flow rate by a computerised graphic. If the flow rate is not at the right level the machine will not give a measurement.

Carol says: *"There is a shorter test you can do for smaller children but I usually use the 10 second test for most patients over six years old."*

How much training is needed to use a FeNO device?

A short training is needed which is provided by the manufacturer either by coming in to the surgery or via online webinars. The practitioner needs to be shown how to use the machine and to be taught what the different FeNO measurements mean. For example tonsillitis or smoking can result in higher readings amongst other things.

What does it cost?

One of the FeNO machine manufacturers says the costs of the machine plus the consumables work out at £6 per test over 5 years or £450 per quarter. These prices are obviously dependent on the number of test done and are exclusive of VAT but provide a rough ballpark of the costs involved .

Carol believes that the FeNO test saves money by reducing unscheduled emergency GP appointments, A&E visits and hospitalisation and by ensuring clinicians put patients on the right medication first time and by improving compliance. Stepping down to appropriate doses of inhaled steroids also saves money.

References

1. Asthma: diagnosis and monitoring of asthma in adults, children and young people. NICE. January 2015 <http://www.nice.org.uk/guidance/indevelopment/gid-cgwave0640>