

# Measure breath nitric oxide for airway inflammation with the **NObreath®** FeNO monitor



*Improving asthma management, one breath at a time.*

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## Fractional Exhaled Nitric Oxide (FeNO)

Airway inflammation is a central process in asthma and other lung diseases<sup>1</sup>. Being able to detect eosinophilic airway inflammation and monitor a patient's response to treatment is regarded as a gold standard in the management of respiratory diseases.

The production of nitric oxide is often found to be higher in inflammatory conditions such as asthma and therefore FeNO monitoring can be used for the detection and management of such conditions<sup>2</sup>, but also to differentiate between COPD, ACOS and other interstitial lung diseases that are not assessed by other means, such as lung function<sup>3</sup>.

Nitric oxide measurement is not intended as a stand-alone method for diagnosis and should be used in conjunction with other evaluation methods and tests<sup>4</sup>.

Using FeNO measurements to evaluate airway inflammation in asthma represents a significant advance in respiratory medicine<sup>5</sup>, but until now this has been an expensive test to deliver in everyday practice.

### Benefits of performing FeNO tests:

- Non-invasive, quick and easy to perform<sup>5</sup>
- Shows patient's response to treatment, enabling the correct prescription of medication and safer/monitored adjustments
- Shows patient adherence to treatment
- Aids in identifying patients who do/do not require on-going treatment<sup>6</sup>
- Shown to be superior to the majority of conventional tests of lung function, such as peak flow recording and spirometry<sup>5</sup>
- Aids in differentiating between allergic (eosinophilic) and non-allergic asthma<sup>7</sup>.



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# NObreath® features

An ergonomic design, fully portable and incorporated with SteriTouCh® technology for optimum infection control.

Clinically proven

Low cost

Low maintenance

INDEPENDENTLY TESTED  
SteriTouCh  
ANTIMICROBIAL TECHNOLOGY



The image shows the NObreath Dock device, a white, ergonomic, portable unit with a purple front panel. The top section features a color LCD screen displaying the NObreath logo, a battery level indicator, and two cartoon characters holding mobile phones. Below the screen is a large purple play button. At the bottom of the screen are icons for a document and a gear. The front panel has a circular sensor in the center. The base of the device is labeled 'NObreath Dock'. The device is surrounded by eight circular icons representing its features: a checkmark, a pound sign with a downward arrow, crossed wrench and screwdriver, an infinity symbol, a thumbs up, a family icon, a Bluetooth symbol, and a circular seal for SteriTouCh technology.

Unlimited usage

Easy to use

Adult & child testing

## Measuring FeNO with NObreath®

IT'S AS EASY AS:



## Consumables

### NObreath® Mouthpiece

The NObreath® mouthpiece is single-patient use and incorporates a one-way valve to prevent air being drawn back from the monitor. The mouthpiece itself is specifically designed with integrated filtration to remove: >99% of airborne bacteria, >96% of viruses<sup>8</sup>.



### Monitor Cleaning Wipes

Free from alcohol to ensure continued performance of your monitor. Pack of 50 wipes.



## Technical specification

Concentration range		0-500ppb
Display		Full colour touchscreen
Detection principle		Electrochemical sensor
Repeatability		±5ppb of measured value ≤ 50ppb ±10% of measured value > 50ppb
Accuracy		±5ppb of measured value ≤ 50ppb ±10% of measured value > 50ppb
Power	NObreath® monitor	1 x main rechargeable Li-ion battery- Approx. 100 uses on fully charged battery 2 x Li-ion coin cell battery- Approx. 5 years Input: 5V, 0.5A
	NObreath® Dock	Mains powered Input: 5V, 0.5A Output: 5V, 0.5A
	Plug	Input: 100-240V ~ 50/60Hz., 0.2A Output: 5.0V, 1.0A
T <sub>90</sub> response time		≤10 seconds
Operating temperature		10-30°C
Storage/transport temperature		0-40°C
Operating/storage/transport pressure		Atmospheric ±10%
Operating humidity		25-75% non-condensing
Storage/transport humidity		0-95% non-condensing
Storage operating life		5 years (subject to servicing)
Sensor sensitivity		1ppb
Sensor drift		<5% per annum
Dimensions		Approx. 90 x 159 x 59 mm
Weight		Approx. 400g
Materials	NObreath® monitor	Case: polycarbonate/abs blend SteriTouch® anti-microbial additive
	NObreath® Dock	
	NObreath mouthpiece	Polypropylene
Breath test time		Adult: 12 seconds Child: 10 seconds Ambient: 30 seconds
Warm-up time		≤60 seconds
Maximum ambient operating level		350 ppb NO
CO cross interference		45ppm ≤17.6 ppb

## FeNOchart™

FeNOchart is free patient management software available with every NObreath®. FeNOchart enables you to track patients progress, view live reading, download results plus much more.



**FREE FeNOchart™ patient management software.**

## NObreath® Forum

Purchasing a NObreath® entitles you to free membership of the NObreath® forum. The NObreath® forum is an international, invitation-only platform where professionals using the Bedfont® NObreath® FeNO monitor can communicate, share experiences and knowledge, and ask for other professional opinions. There is no cost or obligation to participate but membership is free when you purchase a NObreath®.



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## Aid in diagnosis using the NObreath® FeNO monitor

FeNO (ppb) Levels	LOW <25ppb (<20ppb in children)	INTERMEDIATE 25-50ppb (20-35ppb in children)	HIGH >50ppb (>35ppb in children) or rise in FeNO of >40% from previously stable levels
<b>Symptomatic</b> (chronic cough and/or wheeze and/or shortness of breath during past 6 wk)	<p>**Allergic airway inflammation unlikely</p> <p>Unlikely to benefit from ICS</p>	<p>Be cautious</p> <p>Evaluate clinical context</p> <p>Monitor change in FeNO over time</p>	<p>Allergic airway inflammation present</p> <p>Likely to benefit from ICS</p>
<b>Possible Diagnosis</b>	<ul style="list-style-type: none"> <li>• Non-allergic asthma</li> <li>• Rhinosinusitis</li> <li>• Reactive airways dysfunction syndrome</li> <li>• Bronchiectasis</li> <li>• Cystic fibrosis, primary ciliary dyskinesia</li> <li>• Extended post-viral bronchial hyperresponsiveness syndrome</li> <li>• Vocal cord dysfunction</li> <li>• Non-pulmonary/airway causes:</li> <li>• Anxiety-hyperventilation</li> <li>• Gastroesophageal reflux disease</li> <li>• Cardiac disease/pulmonary hypertension/pulmonary embolism</li> </ul> <p><b>Confounding factors:</b></p> <ul style="list-style-type: none"> <li>• Smoking</li> <li>• Obesity</li> </ul>	<p>Evaluate clinical context</p>	<ul style="list-style-type: none"> <li>• Allergic asthma</li> <li>• Atopic asthma</li> <li>• Allergic bronchitis</li> <li>• COPD with mixed inflammatory phenotype</li> </ul>

### References

1. Shelhamer JH, Levine SJ, Wu T, Jacoby DB, Kaliner MA, Rennard SI. NIH conference: airway inflammation. Ann Intern Med 1995;123:288-304.
2. Saito J, Gibeon D, Macedo P, Menzies-Gow A, Bhavsar P, Chung K. Domiciliary diurnal variation of exhaled nitric oxide fraction for asthma control. 2017.
3. ATS/ERS Recommendations for Standardized Procedures for the Online and Offline Measurement of Exhaled Lower Respiratory Nitric Oxide and Nasal Nitric Oxide, 2005; American Journal of Respiratory and Critical Care Medicine; vol. 171: 912-930;2005
4. Correlation of Exhaled Nitric Oxide, Spirometry and Asthma Symptoms: Journal of Asthma: Vol 42, No 10 [Internet]. Tandfonline.com. 2017 [cited 15 March 2017]. Available from: <http://www.tandfonline.com/doi/abs/10.1080/02770900500371344>

# sis & management of Asthma

ness of medication and can be used to predict the risk of Asthma attacks<sup>1\*</sup>.

## Monitoring (in patients with diagnosed asthma) using the NObreath® FeNO monitor

FeNO (ppb) Levels	LOW <25ppb (<20ppb in children)	INTERMEDIATE 25-50ppb (20-35ppb in children)	HIGH >50ppb (>35ppb in children) or rise in FENO of >40% from previously stable levels
<b>Symptomatic</b> (chronic cough and/or wheeze and/or shortness of breath during past 6 wk)	Possible alternative diagnosis (see below)  Unlikely to benefit from increase in ICS	Persistent allergen exposure  Inadequate ICS dose  Poor adherence  Steroid resistance	Persistent allergen exposure  Poor adherence or inhaler technique  Inadequate ICS dose  Risk for exacerbation  Steroid resistance
<b>Possible Diagnosis</b>	<ul style="list-style-type: none"> <li>• **Non-allergic asthma (probably steroid unresponsive)</li> <li>• Vocal cord dysfunction</li> <li>• Anxiety-hyperventilation</li> <li>• Bronchiectasis</li> <li>• Cardiac disease</li> <li>• Rhinosinusitis</li> <li>• Gastroesophageal reflux disease</li> </ul>	Evaluate clinical context	<ul style="list-style-type: none"> <li>• Allergic asthma</li> <li>• Atopic asthma</li> <li>• Allergic bronchitis</li> <li>• COPD with mixed inflammatory phenotype</li> </ul>
<b>Asymptomatic</b>	Implies adequate dosing and good adherence to anti-inflammatory therapy ICS dose may possibly be reduced (repeat FeNO 4 week later to confirm this judgment; if it remains low then relapse is unlikely).	Adequate ICS dosing  Good adherence  Monitor change in FENO	ICS withdrawal or dose reduction may result in relapse  Poor adherence or inhaler technique

5. Andrew D. Smith, Jan O. Cowan, Sue Filsell, Chris MacLachlan, Gabrielle Monti-Sheehan, Pamela Jackson and D. Robin Taylor. Diagnosing Asthma: Comparisons between Exhaled Nitric Oxide Measurements and Conventional Tests. Am J Respir Crit Care Med Vol 169. pp 473-478, 2004.

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7. Coumou HBel E. Improving the diagnosis of eosinophilic asthma [Internet]. Taylor and Francis online. 2017 [cited 15 March 2017]. Available from: <http://www.tandfonline.com/doi/full/10.1080/17476348.2017.1236688>

8. Public Health England. An Evaluation of Filtration Efficiencies Against Bacterial and Viral Aerosol Challenges Report No. 17/001. London: Public Health England; 2017.

\* FeNO is not a definitive indication of asthma and should be used in conjunction with (but not limited to) spirometry, patient history, symptoms.

\*\*Allergic = Eosinophilic / Non- Allergic = Non-Eosinophilic



Contact Bedfont® or one of our worldwide **NObreath®** distributors for a free demonstration.

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***Our family, innovating health, for yours.***

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