

# FeNO Use in Primary Care Management of Asthma

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## INTRODUCTION

- Three GP practices based in Omagh Health Centre wished to address the findings of the National Review of Asthma Deaths (NRAD) report and implement best practice to reduce the risk of serious events occurring in asthma patients.
- The main aim of the project was to identify high risk patients and ensure all relevant healthcare professionals were engaged in the patient's care pathway so the chance of a serious event occurring was minimised.

With the NRAD report highlighting once again the issue of asthma deaths it was imperative that the practices took measures to address the findings and recommendations made in the report. The original aims of the project included active case finding within the practices to identify those patients who had markers of poor control, in particular those who were over ordering reliever inhalers. 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 an exhaled breath (fractional exhaled nitric oxide or FeNO), clinicians can evaluate allergic airway inflammation in patients with underlying asthma.

### FENO - Aid in treatment

- Determine the likelihood of steroid responsiveness
- Guide stepwise changes in anti-inflammatory medication (step-down dosing, step-up dosing, or discontinuation)

### FENO - Assist in monitoring control and adherence

- Establish baseline FeNO level during a period of clinical stability, which can be subsequently monitored
- Help determine whether patients are adhering to prescribed inhaled corticosteroid [ICS] treatment

## METHODS

The practice clinical systems were interrogated to identify the following patient cohorts:

1. Asthma patients who had ordered 12 or more reliever inhalers in the previous 12 months
2. Patients who were prescribed regular inhalers and who were not on the practice's respiratory registers
3. Patients who were prescribed separate ICS and LABA inhalers

A pilot project utilising FeNO measurement as an asthma management tool in primary care was run alongside the risk management project in the three practices. Asthma patients attending the practice nurse for annual review or as a result of being symptomatic were offered FeNO measurement.

## METHODS

The project commenced in June 2015 and, initially, the team focussed on high-risk patients and those receiving regular respiratory medication, but who weren't on the practice Asthma register.

Eligible patients were those aged over 8 years who, at an index date, had their first FeNO measurement via NIOX VERO®. All eligible patients had to have at least one (baseline) and one complete (outcome) FeNO measurement.

### Interventions

- Validation of practice respiratory registers (asthma and COPD) to improve accuracy and practice governance. Ensured all patients prescribed regular respiratory medication had an accurate diagnosis recorded.
- Invitation to asthma review with practice nurse for high risk / uncontrolled patient
- Medications use review including compliance check – using clinical notes and face-to-face during asthma review
- Patient education focussing in disease, symptom recognition and management of potential exacerbations
- Inhaler technique check
- Self management plan
- Step down treatment
- Step up treatment
- Refer to secondary care

## RESULTS

Practice Population	27,495
Asthma Register	1,711 (6.22%)
Separate ICS and LABA inhalers	0
6+ SABA – Not on QOF Register	102
12+ SABA in previous 12 months	143
6+ SABA no ICS	44

From 125 patients tested, 39 had an elevated FeNO and were invited for follow up measurement. When FeNO level was elevated patients were offered appropriate therapeutic intervention and patient education. Mean age of patients was 36.0 years, range 9.5 – 78.9 years. The median FeNO measurement before / after intervention and education was 72 / 45 ppb, p-value of < 0.001 [Wilcoxon Rank Sum test].

These patient reviews led to drug cost savings due to implementation of a practice Formulary and to the development of practice Asthma management protocols. Projected prescribing cost savings were in the region of £15,000 pa.



## CONCLUSIONS

With increasing numbers of referrals of patients with Respiratory illness to hospital and limited resources it is essential that Respiratory services develop new methods of patient assessment, improve links with primary care and develop knowledge of Respiratory management amongst all health care professionals.

This study demonstrates that elevated FeNO levels can be reduced significantly with appropriate intervention, including patient education. Further research is required in order to understand the components contributing to the reduction in FeNO levels (behavioural v pharmacological).

## RECOMMENDATIONS

Practice clinical systems be interrogated on at regular intervals (e.g. 6 monthly) to identify high risk patients and manage accordingly

In the UK, FeNO is being used in primary practice to guide ICS initiation and dosing decisions and to identify poor ICS adherence. Simple algorithms to guide clinicians in the practical use of FeNO could improved diagnostic accuracy and better tailored asthma regimens.

In the next stage of the study each patients categorisation based on FeNO testing is being used for diagnosis, patient education, steroid response/compliance testing or suitability for steroid dose reduction (step down). By doing this it should be possible to measure more specific outcomes and in doing so provide a better idea of how best to utilise FeNO testing in primary care.

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