

Reference ranges of the tests

- FeNO in adults – over 50ppb supports diagnosis
- FeNO in children – over 35ppb supports diagnosis
- Blood eosinophils – over lab reported reference range supports diagnosis
- Spirometry - Post BDR rise in Fev-1 $\geq 12\%$ and 200ml (just 12% in children) or more or $\geq 10\%$ predicted normal.
- PEFr – 20% mean variability over 2 weeks
- Raised eosinophils in children (over 0.5) plus raised IgE or +ve skin prick test to HDM

Reference ranges of the tests

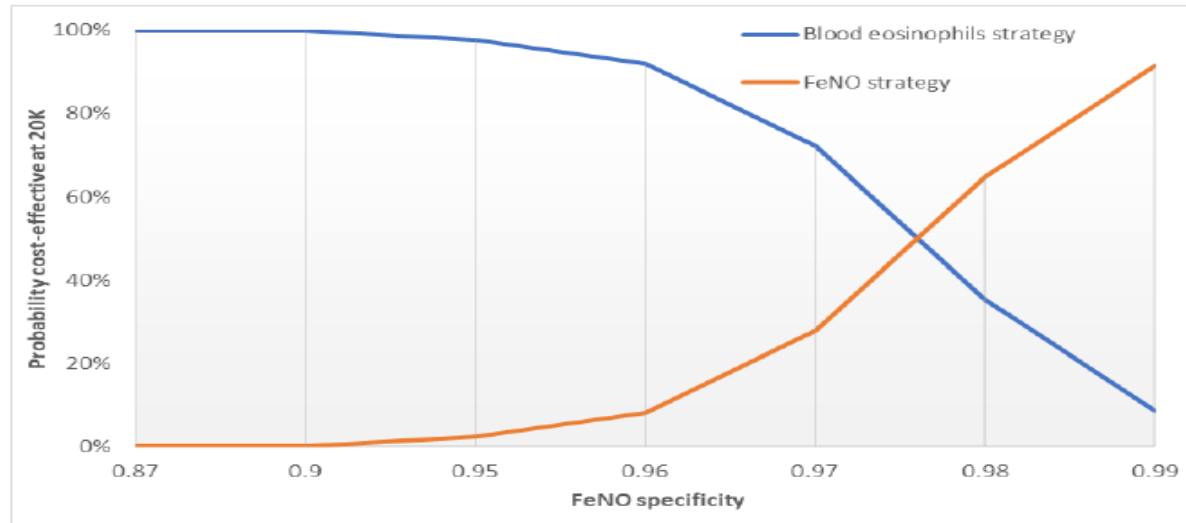
- FeNO in adults – over 50ppb supports diagnosis (inflammation)
- FeNO in children – over 35ppb supports diagnosis (inflammation)
- Blood eosinophils – over lab reported reference range supports diagnosis (inflammation)
- Spirometry - Post BDR rise in Fev-1 $\geq 12\%$ and 200ml (just 12% in children) or more or $\geq 10\%$ predicted normal. (variability)
- PEFr – 20% mean variability over 2 weeks (variability)
- Raised eosinophils in children (over 0.5) plus raised IgE or +ve skin prick test to HDM

Significant changes to NICE guidelines

Asthma specificity (NICE calculation) :

Adults and young people (16 years+)

Figure 21: FeNO specificity threshold analysis



- FeNO only more cost effective when specificity reaches 0.98, which NICE have concluded is at 50ppb+ reading in adults and young people. Because of this, blood eosinophils tests appear slightly more favoured in adults, due to specificity being higher at lower levels. NICE suspect this will lead to less risk of over diagnosis, therefore less resource wastage.

This implies that FeNO is a cost-effective test at the beginning of a diagnostic algorithm only if its specificity at the recommended cut-off is comparable or superior to that of other highly specific tests such as PEFv or blood eosinophils. Otherwise, if its specificity is lower, there is a risk of over diagnosing asthma in the initial step of the sequence, leading to potential resource wastage for the NHS.

Sensitivity refers to the test's ability to correctly detect ill patients who do have the condition.

Specificity relates to the test's ability to correctly reject healthy patients without a condition. Specificity of a test is the proportion of who truly do not have the condition who test negative for the condition.

NICE Economic Evaluation

Economic NICE Evaluation: Summary of all tests included in analysis.

Table 29: Summary of the costs of all tests

Test	Cost of consumables	Staff time required	Total cost
Spirometry	£1.8	20 minutes	£22.93
BDR	£7.47	30 minutes	£39.16
PEFv	£4.65	20 minutes ^(a)	£25.78
FeNO	£6.37	15 minutes	£22.21
Skin prick test	£2.75	40 minutes	£45
Total IgE blood test	NA	NA	£16.03
Blood eosinophils	NA	NA	Adults: £7.66 Children: £8.07
Bronchial challenge test with methacholine or mannitol	NA	NA	£179.49

(a) 10 minutes tested in the scenario analysis

Important Note: IgE, blood eosinophils, & bronchial challenge tests did not consider staff time required in economic evaluation.

NICE Economic Evaluation

Economic NICE Evaluation:

Test combination economic analysis:

NICE acknowledged that there could be an economic advantage of giving specific tests in combination during the same attendance. Specifically, receiving tests in combination could require less time compared to conducting them on separate occasions, thus reducing overall costs. The committee listed a range of combinations that were expected to bring an economic advantage:

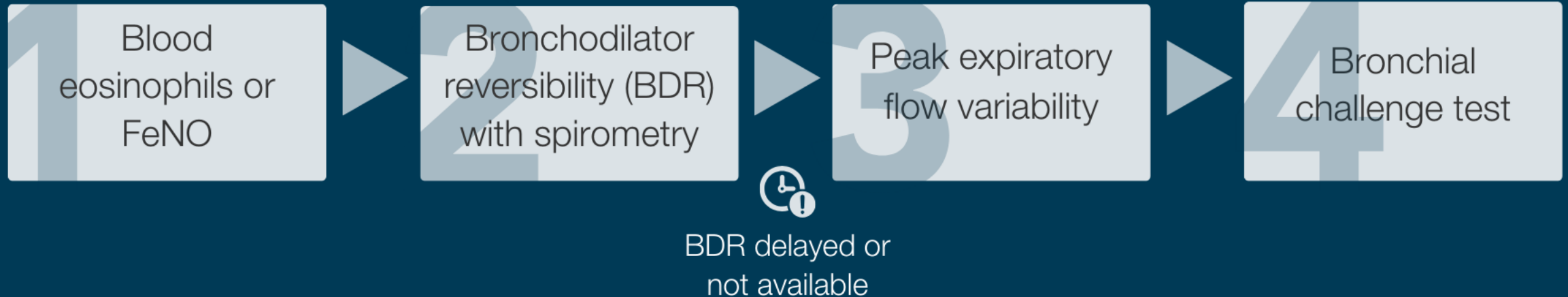
Table 30: Special combinations included in the model

Combination	Consumables	Staff time required	Total cost
Spirometry & FeNO	£7.88	25 minutes	£34.29
BDR & FeNO	£13.55	35 minutes	£50.52
Spirometry & BDR	£7.47 ^(a)	30 minutes	£39.16
Skin prick test & FeNO	£8.41	40 minutes	£50.66
Skin prick test & BDR	£9.80	40 minutes	£62.62
Skin prick test & Spirometry	£4.13	40 minutes	£46.38

(a) Equal to the cost of a single BDR

Diagnosis of asthma in adults

Recommended objective tests for diagnosing asthma in adults and young people (16+)



Diagnosis of asthma in children

Recommended objective tests for diagnosing asthma in children and young people (5-16)

