Introduction
National Institute for Health and Care Excellence (NICE) guideline (NG80) aims to aid asthma diagnosis in children and suggests sequential lung function testing. We compared diagnostic outcomes using NG80 to that of an ‘expert panel’ of respiratory consultants within the Rapid Access Diagnostics for Asthma (RADicA) study.

Method
The RADicA study recruited children aged 5–16 years with symptoms suggestive of asthma. Clinical history, physical examination, and lung function [fractional exhaled nitric oxide (FeNO), spirometry, bronchodilator reversibility, peak expiratory flow variability, methacholine challenge] were assessed before and after inhaled corticosteroid treatment. The ‘expert panel’ reviewed results from all visits and assigned diagnostic categories of ‘asthma’, ‘not asthma’, ‘possible asthma’, or ‘insufficient evidence’.

The NG80 algorithm was used to categorise participants into the same categories using results from the first study visit. If a child was unable to perform a test they were classed as insufficient evidence and stopped from progressing through the NG80 algorithm at that point. This process was then repeated allowing children a second attempt at spirometry and FeNO from study visit 2. Children in whom a diagnosis of ‘asthma’ was not confirmed, were reassessed with their methacholine challenge results. A positive challenge (PD20 < 0.2 mg) was used to confirm ‘asthma’; negative challenge resulted in no change in category and if no challenge was performed classed as ‘Insufficient evidence’.

Results
127 children [mean age (SD) 9 (3) yrs] were enrolled into the study and completed visit 1; 112 children attended visit 2. Diagnostic categories are shown for each method in the table 1 below.

Expert panel gave 56% of children a diagnosis of ‘asthma’ and 20% ‘not asthma’. Allowing children, a second attempt at spirometry and FeNO increased the number with confirmed ‘asthma’ and reduced those classed as insufficient evidence, compared with one attempt. A methacholine challenge in those without a confirmed asthma diagnosis following NG80 recommended testing, significantly increased the number of children with a diagnosis of asthma.

Conclusion
Repeating simple tests in primary care may improve diagnosis and reduce the number requiring further referral. Methacholine challenge further improved the number with confirmed ‘asthma’.

Please refer to page A283 for declarations of interest related to this abstract.

Abstract S42 Table 1 Shows the number of children categorised as asthma, not asthma, possible asthma or insufficient evidence by expert panel, NG80 and its modified versions

<table>
<thead>
<tr>
<th>Expert Panel</th>
<th>NG80 first attempt</th>
<th>NG80 allowing 2 attempts at FeNO and Spirometry</th>
<th>NG80 with Methacholine challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>71 (56%)</td>
<td>20 (16%)</td>
<td>24 (19%)</td>
</tr>
<tr>
<td>Not asthma</td>
<td>25 (20%)</td>
<td>38 (30%)</td>
<td>42 (33%)</td>
</tr>
<tr>
<td>Possible</td>
<td>4 (3%)</td>
<td>16 (12%)</td>
<td>21 (17%)</td>
</tr>
<tr>
<td>Insufficient evidence</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stability of Blood Eosinophil Count and Fractional Exhaled Nitric Oxide over Time in Preschool Children with Wheeze

Introduction
A biomarker-based approach to preschool (age 1–5 years) wheeze might be beneficial. Blood eosinophil count (BEC) and fractional exhaled nitric oxide (FeNO) are potential biomarkers of inhaled corticosteroid (ICS) response, but stability in this population is unknown. We hypothesised that BEC and FeNO are stable in the short term in pre-school children with documented wheeze.

Methods
This was a prospective, year-long, observational study. We compared finger prick for BEC measurement, offline FeNO measurement and skin prick testing (house dust mite, grass and tree pollen, cat, and dog hair) at baseline and on optional repeat occasion. Statistical methods: Intraclass correlation coefficient (ICC) test, chi-square test of independence. ICS treatment change (initiation, dose change, termination), ≥1 wheeze attack between tests, and atopic status (non-atopic, mono-sensitised, poly-sensitised) assessed as factors affecting stability.

Results
97 participants [median age: 35 months (IQR: 23–48 months, male=60), 47 completed the second testing 3–4 months later; BEC and FeNO were measured in 47 and 10 participants respectively. There was no difference between those who did and did not undergo a second test in age, atopic status, FeNO or BEC; a slightly higher proportion of males were re-tested, p=0.04. BEC measurements had poor repeatability (ICC=0.07, p>0.05, within-subject SD=269 cells/μl); FeNO measurements showed moderate repeatability (ICC=0.54, p<0.05, within-subject SD=3.2 ppb). Whatever BEC normal cut-off was examined (≥150, ≥200, ≥300, ≥400 and ≥500 cells/μl) switch in category (normal, abnormal) was equally likely (p>0.05), but stability was observed for both FeNO thresholds (≥5 and ≥10 ppb) (p<0.05). ICS treatment change, ≥1 wheeze attack between measurements or atopy had no association with change in either biomarker (p>0.05). BEC were not stable regardless of atopic status (mono-sensitised (n=11), polysensitised (n=12), non-atopics (n=24)) (p>0.05). Stability was not affected by ICS treatment change (n=12; n=8 initiation, n=2 each ICS stopped or increased dose), ≥1 wheeze attack between measurements (n=15) or atopy.

Conclusion
BEC but not FeNO were unstable over three to four months. Single BEC measurements may be an insufficient guide to preschool wheeze treatment. Due to the small sample size, FeNO results should be considered with caution.

Reference