10 randomly selected questions. (2) Practical oxygen management session including demonstration of oxygen delivery systems and blood gas sampling in a Clinic Skills Department. (3) Ward based supervised skills including completion of five oxygen prescriptions and blood gas samples.

Results The CBKT score was low with an average of 6.2 of 10 questions answered correctly after the first attempt. After 10 attempts only 72% students passed thus 28% (94 students) were unable to reach the pass threshold. The Abstract P75 table 1 relates the pass rate to the numbers of attempts shows only a modest incremental increase in the cumulative pass rate. In contrast, all students rapidly gained the skills to undertake blood gas sampling and were able to write oxygen prescriptions based on SpO2 results.

Abstract P75 Table 1 Pass rates related to number of attempts

Attempts	1	2	3	4	5	6	7	8	9	10
Numbers passing	92	36	3	12	15	1	15	6	10	52
Cumulative %	27	38	39	43	47	47	52	54	56	72

Conclusions This study confirms that medical students, like other staff, have a poor basic knowledge about the use of emergency oxygen. The Liverpool PSP is addressing this knowledge gap but in view of the results further education (eg, seminars and e-learning) will be provided prior to the CBKT. We recommend this type of programme to other Medical Schools and clinical staff.

Paediatric asthma

P76 LONG-TERM EFFECTIVENESS OF A STAGED ASSESSMENT FOR PROBLEMATIC SEVERE ASTHMA

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Background Children with problematic severe asthma (PA) may have genuine therapy-resistant disease, or may be difficult-to-treat because of unaddressed potentially modifiable factors.

Objectives Evaluate the long-term efficacy of a structured protocol including a nurse-led assessment[1] (Stage 1) in identifying modifiable factors and differentiating difficult asthma (DA) from severe therapy-resistant asthma (STRA) in children with PA. As a secondary aim, we determined whether DA and STRA could be identified without the detailed assessment.

Methods 78 children, median age 11.8 years (range 5–17 years), that underwent Stage 1 assessment between 2005 and 2008 were included. Lung function, medications, symptoms and exacerbations were obtained at 1 year, 2 years, and up to 6 years (current status) after initial assessment. Children in whom modifiable factors were identified were classified as DA and those that progressed to further investigations (Stages 2 & 3) as STRA.

Results Median duration of follow-up was 3.9 years (range 2.5–6.1 years). 31/78 (40%) children were classified as DA, and did not proceed to Stages 2 & 3. Children with DA had significantly lower dose inhaled corticosteroids prescribed at follow-up compared to STRA (DA vs STRA: median [IQR] 800 μg [400 μg–1425 μg] vs 1600 μg [800 μg–2400 μg], $p<0.05$), and significantly fewer oral corticosteroid bursts per year (DA vs STRA: median [IQR] 1 [0–2] vs 4 [1.5–8], $p<0.001$). DA children had improved lung function at follow-up compared to baseline (median [IQR] FEV_1 % predicted: 91% [86.5%–102.5%] vs 80% [73%–86%], $p<0.01$) despite lower dose inhaled corticosteroids. DA and STRA had different characteristics at baseline: DA children had a higher FEV_1 % predicted ($p<0.01$), less bronchodilator reversibility ($p<0.05$), lower fractional exhaled nitric oxide ($p<0.05$), and less sensitisation to food and aeroallergens (both $p<0.05$) compared to STRA. However, there was considerable overlap between the groups and the two could not reliably be distinguished in advance of the detailed Stage 1 assessment.

Conclusion As a result of our assessment, 40% of children with PA did not undergo invasive investigations and escalation of therapy. Up to 6 years later, children with DA had a significant improvement in lung function and fewer exacerbations despite reduced maintenance medication.

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P77 LUNG CLEARANCE INDEX (LCI) IN CHILDREN WITH SEVERE, THERAPY RESISTANT ASTHMA (STRA)

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Introduction Spirometry is often normal in children with STRA, and is thus a poor outcome measure (1). Lung Clearance Index is a sensitive, non-effort dependent measure of distal airway gas mixing, which has been shown to be more sensitive than spirometry in Cystic Fibrosis (2). We hypothesised that LCI would be a better marker of steroid response in STRA than spirometry.

Patients and Methods 22 STRA children (Mean age 11.9 years, 15 male) had LCI and spirometry measured before and 4 weeks after intramuscular triamcinolone.

Results LCI was elevated in 18/22 prior to triamcinolone and 12/22 at the follow-up; in contrast FEV_1 was only abnormal in 10/22 and 6/22 pretriamcinolone and posttriamcinolone respectively. Mean LCI fell from 7.86 to 7.25 ($p<0.05$) but there was no statistically significant decrease in FEV_1 after triamcinolone.

Conclusion LCI is a better discriminant of STRA then FEV_1, and is more responsive to steroid treatment. LCI may thus be a better outcome measure in STRA.

Abstract P77 Table 1

	Pre-triamcinolone	4 weeks post-triamcinolone
Mean FEV_1 z-score (normal >-1.64)	−1.39 (SD 2.02)	−1.15 (SD 1.22)
Mean LCI (normal <7.1)	7.86 (SD 1.18)	7.25 (SD 1.44)

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P78 LUNG CLEARANCE INDEX IN CHILDREN WITH ACUTE EXACERBATION OF ASTHMA

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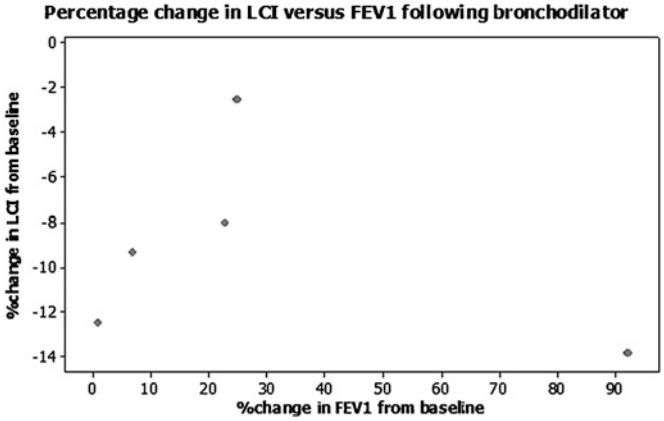
Introduction Lung clearance index (LCI) can detect small airways disease in asthma; however there is no published LCI data collected

during acute exacerbation. We aimed to investigate LCI in asthmatic children requiring oral corticosteroids and admission to hospital.

Methods Children were recruited from acute medical wards. We tested children once they did not require oxygen or >2 hourly salbutamol. Admission details were extracted from medical notes. Multiple breath washout (MBW) was performed with sulphur hexafluoride and the Innocor photoacoustic gas analyser. Spirometry complied with ATS/ERS standards and was performed using the Easyone spirometer. MBW and spirometry were performed shortly before and 15 min after children's clinically prescribed salbutamol. Paired t tests and Pearson correlation coefficients were used in the analysis.

Results Nine children aged 6.4–13.6 years were recruited. Testing began on average 201 min after each child's last salbutamol. LCI was calculated for eight children, the ninth was excluded due to variable FRC. Pre bronchodilator mean (SD) LCI was 8.6 (1.8), but was only abnormal (=7.4) in 5/8 children; following bronchodilator mean (SD) LCI was 8.1 (1.2). Mean (SD) FEV_1 z-score was −3.5 (1.6) and was abnormal (<−1.96) in 6/8 children; post bronchodilator FEV_1 z-score was −2.9 (1.4). Mean LCI correlated with FEV_1 z-score before and after bronchodilator (r=−0.80, p=0.017 and r=−0.76, p=0.030). In patients with abnormal LCI there was a significant improvement after salbutamol; with a mean difference of −0.918, p=0.018. In this group FEV_1 z-score improved by a mean of 0.802, p=0.051. Although overall both measures improved, the degrees of improvement in LCI and FEV_1 did not correlate (r=−0.361, p=0.550). Two patients who both had abnormal pre bronchodilator LCI (mean 11.1) returned 8–10 weeks later, both had normal LCI (mean 6.9).

Conclusions LCI is abnormal in children during exacerbation of asthma. Abnormal LCI improves following bronchodilator, but changes do not correlate with changes in FEV_1. This suggests variable bronchodilator response throughout the airway. Recruitment for this study is ongoing.



Abstract P78 Figure 1 Post bronchodilator change in FEV_1 and LCI in five patients with abnormal LCI.

P79 DO CHILDREN DESCRIBE THE BENEFITS OF INHALED ASTHMA THERAPY IN THE SAME WAY AS ADULTS?

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Introduction Although it is well reported in adults, there is relatively little data on how children with asthma and their parents describe their attitudes to the disease, expectations of therapy and perception of treatment benefit. Our aim was to investigate this and determine if they differed from reports by adults with asthma. We plan to use the results to refine patient reported outcome measures for children with asthma.

Methods We recruited families with an asthmatic child (4–11 years) who had recently been prescribed a change in treatment (starting inhaled corticosteroid monotherapy (ICS) or changing from ICS to inhaled corticosteroid/long acting ß$_2$ agonist combination therapy (ICS/LABA). Semi-structured interviews were conducted with the parents and the children if aged 7–11 years. Transcripts were analysed using a combination of thematic and content analysis and recruitment discontinued in each group once data saturation was reached.

Results We undertook 41 interviews including 28 parents and 13 children. The numbers in each group can be seen in Abstract P79 table 1. All the children on ICS/LABA had been changed as their symptoms were not controlled on ICS monotherapy. The interviews highlighted the significant effects that paediatric asthma has on the whole family and the distress the symptoms cause to the child and their parents. Exacerbations led to frequent school absence and associated time off work for the parents. Both parents and children hoped that the new medication would lead to better symptom control, increased participation in physical activities and decreased visits to the GP or hospital. Positive effects of treatment change were identified, particularly in those changing from ICS to ICS/LABA. Benefits described included improvement in symptoms (especially cough and wheeze), increased participation in sport or play activities and reduced rescue medication use. These effects resulted in few visits to the GP/hospital and better attendance at school.

Abstract P79 Table 1 Number of patients in each group

	ICS	ICS/LABA
Children aged 7–11 years	6	7
Parents of children aged 7–11 years	6	7
Parents of children aged <7 years	8	7

Conclusions While asthma symptoms prevent adults and children from participating in different types of activities (eg, school not employment), children and their parents report the same concepts as adult patients with asthma.

P80 A QUALITATIVE EXPLORATION OF THE NEEDS AND COPING STRATEGIES OF PEOPLE WITH SEVERE ASTHMA

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Introduction and Objectives Many people with severe asthma experience frequent debilitating symptoms and treatment side effects, both of which can have a significant impact on their quality of life. While previous qualitative studies have investigated attitudes to healthcare usage among people with severe asthma symptoms, there is relatively little evidence about how people with ongoing severe asthma cope with its broader impact on their lives. This study sought to examine how people with severe asthma and their families view the impact of the condition and how this affects their approach to its management.

Methods Eight focus groups were held in five tertiary centres around the UK in 2010. Participants were grouped into young people with severe asthma (N=8), adults with severe asthma (N=26) and