



Northern Ireland Paediatric Asthma Audit

A Regional Audit of Paediatric Asthma Care

December 2017

www.rqia.org.uk

Assurance, Challenge and Improvement in Health and Social Care

Contents	Page
Background and rationale	2
Aims	3
Objectives	4
Standards/guidelines/evidence base	4
Methodology	7
Findings	9
Observations/discussion	27
Recommendations	31
Action Plan	32
Project Team	35
Appendix 1 – Data collection tool	36

Background and Rationale

The Department of Health (DoH) has developed a range of service frameworks to improve the health and social wellbeing of patients in Northern Ireland. These service frameworks set out explicit standards for health and social care that are evidence-based and can be measured through key performance indicators. The standards and key performance indicators in service frameworks are informed by national standard setting bodies such as the National Institute for Health and Care Excellence (NICE) and the Social Care Institute for Excellence (SCIE) amongst others, as well as clinical and patient expert advice . Assessing progress in implementing service frameworks requires regular audits.

The aims of the Service Framework for Respiratory Health and Wellbeing 2015-18 (https://www.health-ni.gov.uk/sites/default/files/publications/dhssps/service-framework-respiratory-2015-18_0.pdf) are to improve the health and wellbeing of the population of Northern Ireland, reduce inequalities and improve the quality of health and social care in relation to respiratory diseases.

The Service Framework for Respiratory Health and Wellbeing sets standards for the care of individuals and communities who currently have or are at risk of developing respiratory disease, under the headings of:

- Prevention
- Assessment
- Diagnosis
- Treatment
- Care
- Rehabilitation and
- Palliative care.

The standards and key performance indicators aim to ensure that health and social care services are:

- Safe
- Effective
- Efficient
- Accessible
- Patient/client centred and
- Equitable.

Respiratory disease is the most commonly reported physical long term illness in children and young people and the third most commonly reported one in adults, after musculoskeletal and circulatory disorders.¹ Asthma is the most commonly diagnosed respiratory illness¹ and can be a life threatening condition requiring rapid access to emergency services. Prompt assessment and effective management of this condition is therefore important, which is why the Service Framework for Respiratory Health and Wellbeing contains specific standards both for adult and children's asthma care.²

This audit was undertaken to measure Northern Ireland health and social care trusts' (HSCTs) performance in the delivery of children's and young people's asthma services against relevant standards and key performance indicators in the Service Framework for Respiratory Health and Wellbeing.

Aim

The aim of this audit was to assess practice across all Northern Ireland HSCTs in the management of children and young people admitted to hospital with an acute exacerbation of asthma and subsequently during follow up services and compare it with evidence for good practice^{3,4} reflected in relevant standards and key performance indicators in the Service Framework for Respiratory Health and Wellbeing (Table 1).

The results from this audit will be used to inform service development and improvement of children's and young people's acute asthma care in Northern Ireland.

¹ British Lung Foundation. The battle for breath- the impact of lung disease in the UK. 2017

² Royal College of Physicians. Why asthma still kills. The National Review of Asthma Deaths. London, 2014

³ National Institute for Health and Care Excellence. Asthma. Standard 25. 2013

⁴ British Thoracic Society and Scottish Intercollegiate Guideline Network. British Guideline on the management of asthma. Updated 2016.

Objectives

1. To determine if patients under 16 years, presenting with acute severe asthma to acute care settings, who have an oxygen saturation of less than 94% at presentation, have a post-bronchodilator oxygen saturation measured and are admitted if it remains under 92%.
2. To determine if patients under 16 years presenting with an acute exacerbation of asthma to acute care settings, are managed in line with evidence for best practice⁴:
 - a. Timely provision of oral corticosteroids where necessary
 - b. Assessment of adherence to prescribed medication
 - c. Smoking cessation offered to family members where necessary
 - d. Inhaler technique checked
 - e. Provision of asthma information leaflets
 - f. Provision or review of asthma action plan.
3. To determine if patients under 16 years with an acute exacerbation of asthma are recommended follow up by primary care or hospital clinician within 14 working days after discharge home.
4. To determine if patients under 16 years of age admitted with acute severe asthma, and who are on medium/high dose inhaled corticosteroids, have been given a corticosteroid alert card.
5. To make recommendations for children and young people's asthma service development, organisation, education and training.

Standards/guidelines/evidence base

Table 1 outlines the key performance indicators and levels of anticipated service performance (targets) in the Service Framework for Respiratory Health and Wellbeing and the evidence informing these.

Table 1 – Key Performance Indicators in paediatric asthma audit

Key Performance Indicator		Target	Evidence
KPI 27a	Percentage (%) of children and young patients presenting with acute severe asthma to ED who have an oxygen saturation 94% or less, who have a post bronchodilator oxygen saturation carried out and result recorded (if remains less than 92%, person should be admitted).	60%	Northern Ireland Service Framework for Respiratory Health and Wellbeing Respiratory health and well being - service framework documents Department of Health British Thoracic Society (BTS) and Scottish Intercollegiate Guideline Network (SIGN) guideline on the management of asthma, 2016 https://www.brit-thoracic.org.uk/document-library/clinical-information/asthma/btssign-asthma-guideline-2016/ NICE Asthma Standard 25, 2013 Asthma Guidance and guidelines NICE
KPI 27c	Percentage (%) of children and young patients with acute severe asthma presenting in emergency departments or ambulatory care settings with a record of follow-up (telephone or face-to-face) within 14 days of the episode by the GP, practice nurse, community or secondary care.	Establish baseline performance levels	As above
KPI 27d	Percentage (%) of children and young patients with acute severe asthma are admitted, who are reviewed (by telephone or face-to-face) by an asthma specialist paediatric nurse within 14 days of discharge.	Establish baseline performance levels	As above
KPI 29a	Percentage (%) of children and young patients on beclomethasone dipropionate or budesonide 800 mg/day (or fluticasone propionate 400 mcg/day) who have been given a steroid alert card.	90%	As above
KPI 29c	Percentage (%) of children and young patients admitted who have appropriate inpatient management and discharge planning as per BTS guidelines.*	50%	As above

*NB: in relation to KPI 29c, this audit has concentrated on several individual elements of BTS guidance as outlined previously in objective 2a-f.

Methodology

A project team was established by the regional respiratory lead within the Public Health Agency (PHA), and HSCT nominations were sought through the Northern Ireland Paediatric Respiratory & Allergy Network (NIPRAN). The team included paediatric respiratory nurses and medical staff, as well as the regional respiratory lead and project manager within the Public Health Agency (PHA) and RQIA audit staff.

The project team agreed the methodology, data sources, patient sample sizes, audit standards, data collection tools, data analysis and final report.

Sample

A request for total admission numbers from the Patient Administration System (PAS) for the period September 2015 – November 2015 was made to the Health and Social Care Board (HSCB) information department. ICD-10 codes were used to identify relevant patients, of which there were 269. The required sample size for each HSCT was determined using the ©Raosoft sample calculator (an electronic database to provide random sampling numbers and confidence levels).

The total sample size was 151 cases across the five HSCTs. Patients were sequentially selected in order of the date of attendance/admission, and their clinical notes were audited if available, until the predetermined sample size for each HSCT was reached. The distribution of patients across all HSCTs is outlined in Table 2.

Table 2 – Audit sample size by Trust

HSCT	Total admissions during audit period Sept-Nov 2015	Sample size
Trust A	73	35
Trust B	37	22
Trust C	30	17
Trust D	81	48
Trust E	48	29
Total	269	151

Data source

The data source used for the audit was the Patient Administration System (PAS), which allowed the project team to then identify patient case notes.

Audit type

The audit was retrospective and based on review of patient case notes.

Data collection methods

Data collectors were identified within each HSCT, and following training on the use of the data collection tool, the data were collected and entered onto a Microsoft Excel spreadsheet. The information on the spreadsheet was anonymised before being sent to the project manager for data cleansing and analysis.

Data collectors and training

Data collectors attended a training session, where they were presented with an overview of the project, audit standards and methodology involved. They examined sample patient clinical notes and made data entries into the data collection tool. Any issues identified in this process were taken into account in the final revision of the data collection tool. To support the data collectors during the data collection process, the PHA project manager was available to deal with any queries or issues.

Data analysis

All HSCTs completed the required data collection and sent the anonymised data to the PHA project manager, who collated all returns onto one master database. Data were cleansed, analysed and results produced for the audit report by the PHA project manager.

Findings

All five HSCTs participated in the audit and returned the required number of cases. The final sample size of cases identified for inclusion in the audit of children and young patients with acute severe asthma who attend emergency departments, ambulatory departments or were admitted was 151.

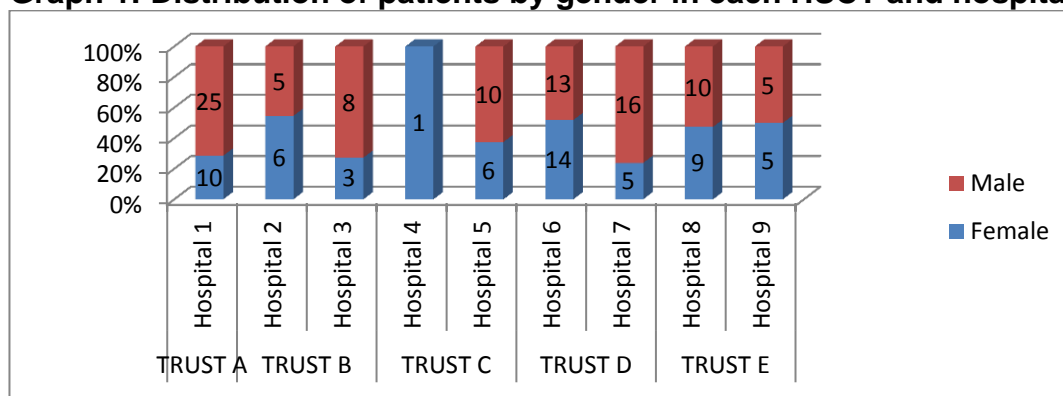
Throughout this report findings are presented in table and graph format and will be discussed later in the observations and recommendations sections of the report.

Distribution of Patients

Table 3: Distribution of patients by gender in each HSCT and hospital

TRUST & Hospital	Male	%	Female	%	Total
TRUST A	25	71%	10	29%	35
Hospital 1	25	71%	10	29%	35
TRUST B	13	59%	9	41%	22
Hospital 2	5	45%	6	55%	11
Hospital 3	8	73%	3	27%	11
TRUST C	10	59%	7	41%	17
Hospital 4	0	0%	1	100%	1
Hospital 5	10	63%	6	38%	16
TRUST D	29	60%	19	40%	48
Hospital 6	13	48%	14	52%	27
Hospital 7	16	76%	5	24%	21
TRUST E	15	52%	14	48%	29
Hospital 8	10	53%	9	47%	19
Hospital 9	5	50%	5	50%	10
Total	92	61%	59	39%	151

Graph 1: Distribution of patients by gender in each HSCT and hospital



Data analysed showed there were 59 females (39%) and 92 males (61%) across the region. Trust D (48 patients) had the largest identified cohort during the audit period.

Table 4: Distribution of patients by age band in each HSCT and hospital

TRUST & Hospital	0-24mths	%	2 to 5yrs	%	5 to 12yrs	%	12-16yrs	%	Total
TRUST A	4	11%	18	51%	13	37%	0	0%	35
Hospital 1	4	11%	18	51%	13	37%	0	0%	35
TRUST B	1	5%	6	27%	13	59%	2	9%	22
Hospital 2	0	0%	4	36%	6	55%	1	9%	11
Hospital 3	1	9%	2	18%	7	64%	1	9%	11
TRUST C	0	0%	8	47%	6	35%	3	18%	17
Hospital 4	0	0%	0	0%	0	0%	1	100%	1
Hospital 5	0	0%	8	50%	6	38%	2	13%	16
TRUST D	2	4%	23	48%	20	42%	3	6%	48
Hospital 6	2	7%	14	52%	10	37%	1	4%	27
Hospital 7	0	0%	9	43%	10	48%	2	10%	21
TRUST E	1	3%	11	38%	15	52%	2	7%	29
Hospital 8	1	5%	8	42%	10	53%	0	0%	19
Hospital 9	0	0%	3	30%	5	50%	2	20%	10
Total	8	5%	66	44%	67	44%	10	7%	151

Graph 2: Distribution of patients by age, in each HSCT and hospital

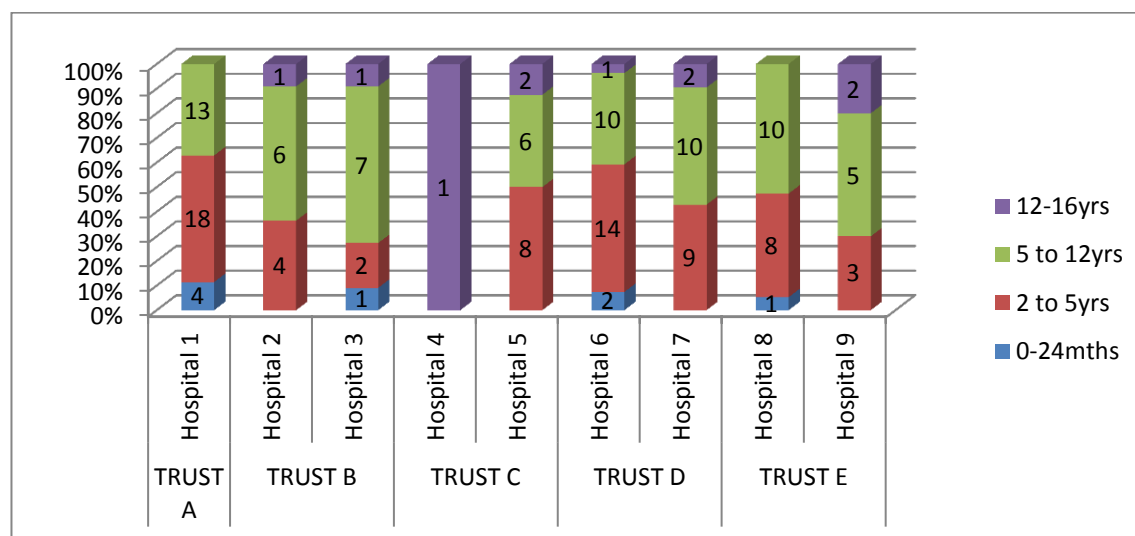


Table 4 and Graph 2 outline the age distribution of patients included in the audit. The majority 88% (133 of 151) were aged between 2 and 12 years old.

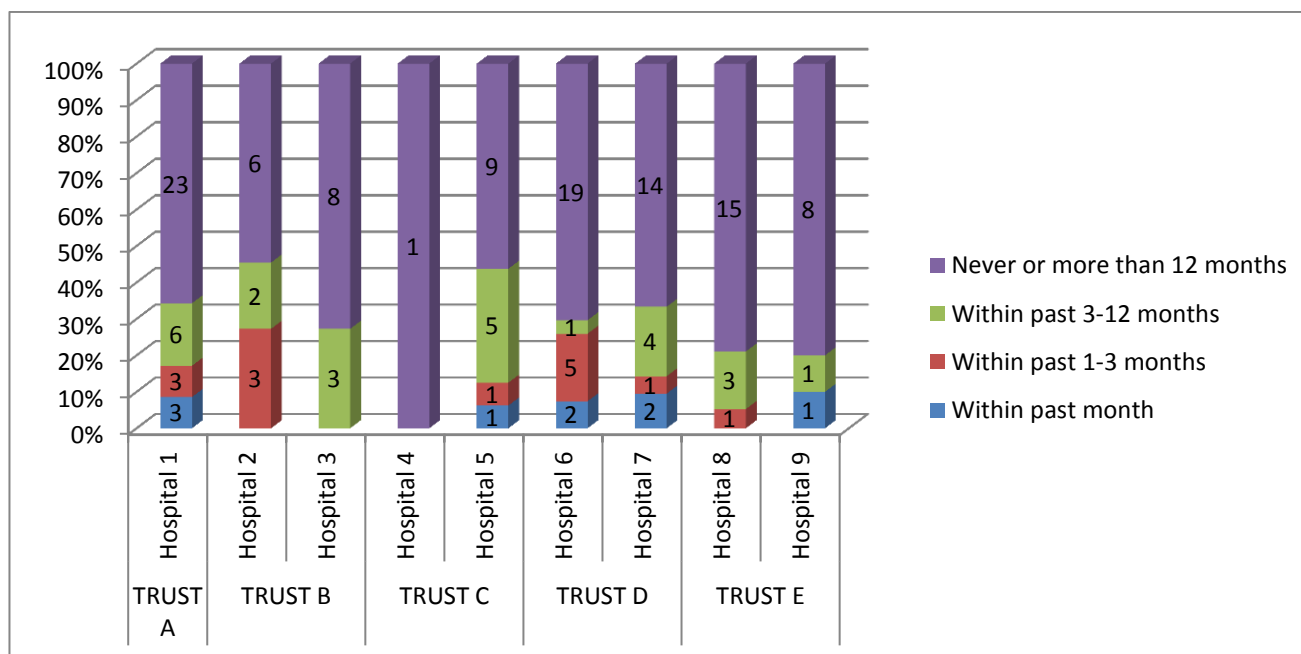
A small proportion of patients, 5% (8 of 151) were under 24 months, and 7% (10 of 151) were between 12 and 16 years. A contributory factor here is the differing upper age limits for admission to paediatric services across each of the hospitals.

Patient's most recent previous admission to hospital for asthma

Table 5: Most recent previous asthma admission, by HSCT and hospital

TRUST & Hospital	Within past month	%	Within past 1-3 months	%	Within past 3-12 months	%	Never or more than 12 months	%	TOTAL
TRUST A	3	9%	3	9%	6	17%	23	66%	35
Hospital 1	3	9%	3	9%	6	17%	23	66%	35
TRUST B	0	0%	3	14%	5	23%	14	64%	22
Hospital 2	0	0%	3	27%	2	18%	6	55%	11
Hospital 3	0	0%	0	0%	3	27%	8	73%	11
TRUST C	1	6%	1	6%	5	29%	10	59%	17
Hospital 4	0	0%	0	0%	0	0%	1	100%	1
Hospital 5	1	6%	1	6%	5	31%	9	56%	16
TRUST D	4	8%	6	13%	5	10%	33	69%	48
Hospital 6	2	7%	5	19%	1	4%	19	70%	27
Hospital 7	2	10%	1	5%	4	19%	14	67%	21
TRUST E	1	3%	1	3%	4	14%	23	79%	29
Hospital 8	0	0%	1	5%	3	16%	15	79%	19
Hospital 9	1	10%	0	0%	1	10%	8	80%	10
Total	9	6%	14	9%	25	17%	103	68%	151

Graph 3: Most recent previous asthma admission, by HSCT and hospital



Assessment

Was SaO₂ greater than 92% in room air on admission to ward, and was SaO₂ measured post-bronchodilation?

Table 6: SaO₂ measurement on admission to a ward in room air, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	First measured on room air	%	Total
TRUST A	19	54%	16	46%	0	0%	35
Hospital 1	19	54%	16	46%	0	0%	35
TRUST B	15	68%	7	32%	0	0%	22
Hospital 2	5	45%	6	55%	0	0%	11
Hospital 3	10	91%	1	9%	0	0%	11
TRUST C	9	53%	7	41%	1	6%	17
Hospital 4	1	100%	0	0%	0	0%	1
Hospital 5	8	50%	7	44%	1	6%	16
TRUST D	29	60%	19	40%	0	0%	48
Hospital 6	19	70%	8	30%	0	0%	27
Hospital 7	10	48%	11	52%	0	0%	21
TRUST E	24	83%	5	17%	0	0%	29
Hospital 8	17	89%	2	11%	0	0%	19
Hospital 9	7	70%	3	30%	0	0%	10
Total	96	64)	54	36%	1	1%	151

Table 7: Confirmation of SaO₂ measurement post bronchodilation, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	Total
TRUST A	33	94%	2	6%	35
Hospital 1	33	94%	2	6%	35
TRUST B	21	95%	1	5%	22
Hospital 2	11	100%	0	0%	11
Hospital 3	10	91%	1	9%	11
TRUST C	14	82%	3	18%	17
Hospital 4	1	100%	0	0%	1
Hospital 5	13	81%	3	19%	16
TRUST D	37	77%	11	23%	48
Hospital 6	17	63%	10	37%	27
Hospital 7	20	95%	1	5%	21
TRUST E	18	62%	11	38%	29
Hospital 8	10	53%	9	47%	19
Hospital 9	8	80%	2	20%	10
Total	123	81%	28	19%	151

Graph 4: Confirmation of SaO2 measurement post bronchodilation, by HSCT and hospital

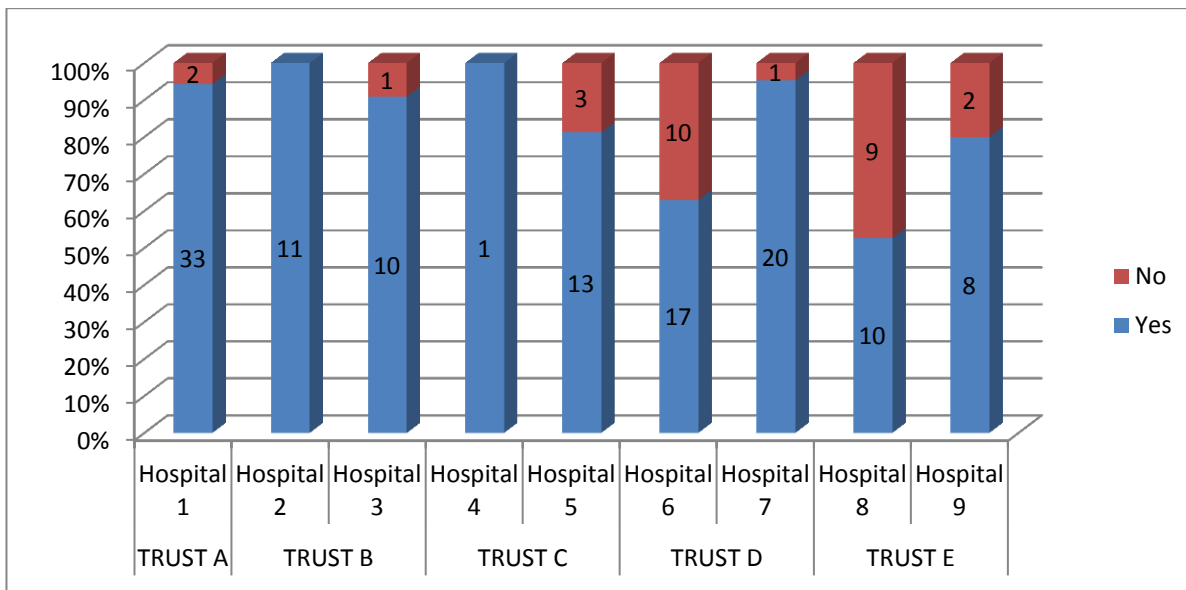


Table 6 shows that 64% (96 of 151) of patients who were admitted to hospital, had their initial oxygen saturation measured at greater than 92% in room air. Thirty six percent (54 of 151) of patients had initial oxygen saturation on admission at less than 92%.

Table 7 shows that 81% (123 of 151) of patients had a saturation measured after bronchodilator treatment.

Treatment

Was the patient taking inhaled corticosteroids (ICS) regularly before admission? If yes, were these increased before discharge and if they weren't on ICS before admission, were they started on these prior to discharge?

Table 8: Use of inhaled corticosteroids (ICS) prior to admission, by HSCT and hospital (and reasons for non-use where relevant)

TRUST & Hospital	Yes		No (beta agonist or Montelukast only)		No (new diagnosis)		No (poor adherence)		Total
TRUST A	19	54%	7	20%	4	11%	5	14%	35
Hospital 1	19	54%	7	20%	4	11%	5	14%	35
TRUST B	13	59%	3	14%	6	27%	0	0%	22
Hospital 2	7	64%	1	9%	3	27%	0	0%	11
Hospital 3	6	55%	2	18%	3	27%	0	0%	11
TRUST C	11	65%	0	0%	4	24%	2	12%	17
Hospital 4	1	100%	0	0%	0	0%	0	0%	1
Hospital 5	10	63%	0	0%	4	25%	2	13%	16
TRUST D	27	56%	2	4%	9	19%	10	21%	48
Hospital 6	13	48%	2	7%	7	26%	5	19%	27
Hospital 7	14	67%	0	0%	2	10%	5	24%	21
TRUST E	20	69%	3	10%	5	17%	1	3%	29
Hospital 8	15	79%	1	5%	2	11%	1	5%	19
Hospital 9	5	50%	2	20%	3	30%	0	0%	10
Total	90	60%	15	10%	28	19%	18	12%	151

Table 9: Patients on ICS before admission - confirmation of whether ICS were increased before discharge, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	Total
TRUST A	8	42%	11	58%	19
Hospital 1	8	42%	11	58%	19
TRUST B	6	46%	7	54%	13
Hospital 2	4	57%	3	43%	7
Hospital 3	2	33%	4	67%	6
TRUST C	5	45%	6	55%	11
Hospital 4	1	100%	0	0%	1
Hospital 5	4	40%	6	60%	10
TRUST D	9	33%	18	67%	27
Hospital 6	3	23%	10	77%	13
Hospital 7	6	43%	8	57%	14
TRUST E	5	25%	15	75%	20
Hospital 8	3	20%	12	80%	15
Hospital 9	2	40%	3	60%	5
Total	33	37%	57	63%	90

Table 10: Patients not on ICS before admission – confirmation of whether ICS were started prior to discharge, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	N/A	%	Total
TRUST A	13	81%	1	6%	2	13%	16
Hospital 1	13	81%	1	6%	2	13%	16
TRUST B	4	44%	2	22%	3	33%	9
Hospital 2	2	50%	1	25%	1	25%	4
Hospital 3	2	40%	1	20%	2	40%	5
TRUST C	1	17%	1	17%	4	67%	6
Hospital 5	1	17%	1	17%	4	67%	6
TRUST D	18	86%	1	5%	2	10%	21
Hospital 6	12	86%	1	7%	1	7%	14
Hospital 7	6	86%	0	0%	1	14%	7
TRUST E	7	78%	1	11%	1	11%	9
Hospital 8	3	75%	0	0%	1	25%	4
Hospital 9	4	80%	1	20%	0	0%	5
Total	43	70%	6	10%	12	20%	61

Table 8 outlines if patients were regularly taking inhaled corticosteroids at time of admission. The table shows that 60% (90 of 151) of patients were on inhaled corticosteroids prior to admission, whilst 40% (61 of 151) of patients were not on any systemic or inhaled corticosteroids at time of admission. Of those who were not on inhaled corticosteroids, 19% (28 of 151) were newly diagnosed on this admission, 12% (18 of 151) were described as 'poor adherence' (i.e. were prescribed but not taking their medication) and 10% (15 of 151) were patients who were not on corticosteroids but were on beta agonists as required for bronchospasm or Montelukast.

For the 90 patients already on inhaled corticosteroids prior to admission, table 9 outlines how many of those patients had their ICS increased prior to discharge. This figure was 37% (33 of 90).

Table 10 outlines how many of those patients not already on inhaled corticosteroids on admission had these commenced prior to discharge, with 70% (43 of 61) of these patients having been started on these drugs during the hospital stay.

Was there a record that an assessment of the patient’s adherence to prescribed medication was made during this admission?

Table 11: Record of assessment of adherence to prescribed medication, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	Total
TRUST A	27	82%	6	18%	33
Hospital 1	27	82%	6	18%	33
TRUST B	2	10%	19	90%	21
Hospital 2	2	20%	8	80%	10
Hospital 3	0	0%	11	100%	11
TRUST C	11	73%	4	27%	15
Hospital 4	1	100%	0	0%	1
Hospital 5	10	71%	4	29%	14
TRUST D	14	33%	28	67%	42
Hospital 6	6	26%	17	74%	23
Hospital 7	8	42%	11	58%	19
TRUST E	8	33%	16	67%	24
Hospital 8	6	33%	12	67%	18
Hospital 9	2	33%	4	67%	6
Total	62	46%	73	54%	135

N.B This tables excludes the 16 patients who were not on ICS prior to admission.

Graph 5: Assessment of adherence to prescribed medication, by HSCT and hospital

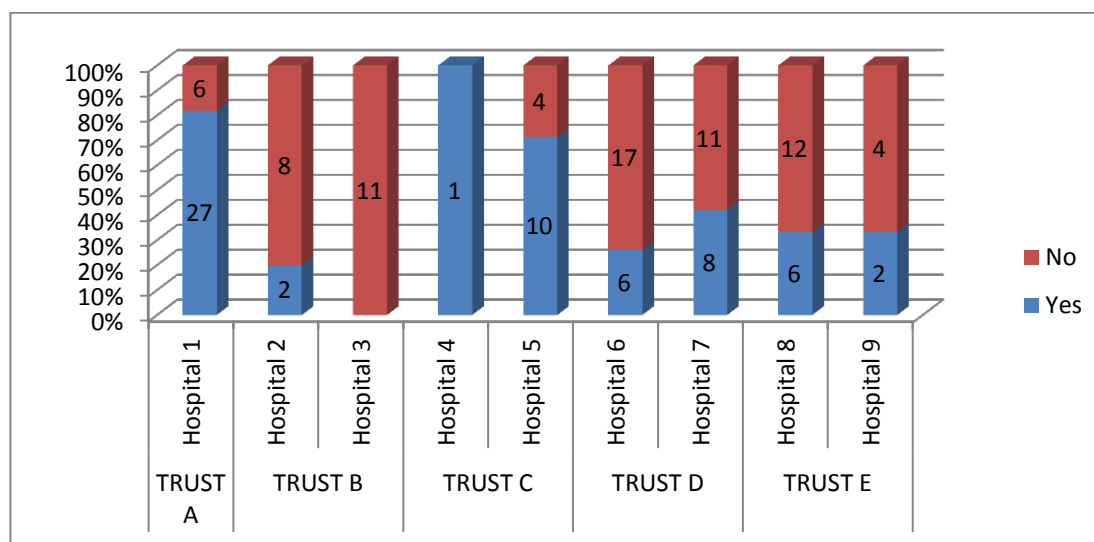


Table 11 and Graph 5 outline records of assessment of adherence to prescribed medication. The table highlights that 46% (62 of 135) of patients had a record of an assessment of adherence to their medication during admission. Hospital 1 has the highest percentage of patients with a record of receiving assessment of medication adherence, 82% (27 of 33).

Were systemic corticosteroids given during this admission, and if so, what timeframe were they given in?

Table 12: Systemic corticosteroids on admission, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	Total
TRUST A	35	100%	0	0%	35
Hospital 1	35	100%	0	0%	35
TRUST B	21	95%	1	5%	22
Hospital 2	10	91%	1	9%	11
Hospital 3	11	100%	0	0%	11
TRUST C	17	100%	0	0%	17
Hospital 4	1	100%	0	0%	1
Hospital 5	16	100%	0	0%	16
TRUST D	48	100%	0	0%	48
Hospital 6	27	100%	0	0%	27
Hospital 7	21	100%	0	0%	21
TRUST E	22	76%	7	24%	29
Hospital 8	15	79%	4	21%	19
Hospital 9	7	70%	3	30%	10
Total	143	95%	8	5%	151

Table 13: Timeframe for provision of systemic corticosteroids, by HSCT and hospital

TRUST & Hospital	prior to admission		within 1 hour		between 1 - 4		between 4 - 24		> 24hrs of		Total
	to ward	%	of admission	%	hrs of admission	%	hrs of admission	%	admission	%	
TRUST A	28	80%	1	3%	1	3%	4	11%	1	3%	35
Hospital 1	28	80%	1	3%	1	3%	4	11%	1	3%	35
TRUST B	12	57%	3	14%	4	19%	0	0%	2	10%	21
Hospital 2	10	100%	0	0%	0	0%	0	0%	0	0%	10
Hospital 3	2	18%	3	27%	4	36%	0	0%	2	18%	11
TRUST C	17	100%	0	0%	0	0%	0	0%	0	0%	17
Hospital 4	1	100%	0	0%	0	0%	0	0%	0	0%	1
Hospital 5	16	100%	0	0%	0	0%	0	0%	0	0%	16
TRUST D	42	88%	3	6%	0	0%	3	6%	0	0%	48
Hospital 6	25	93%	1	4%	0	0%	1	4%	0	0%	27
Hospital 7	17	81%	2	10%	0	0%	2	10%	0	0%	21
TRUST E	12	55%	1	5%	6	27%	3	14%	0	0%	22
Hospital 8	9	60%	1	7%	3	20%	2	13%	0	0%	15
Hospital 9	3	43%	0	0%	3	43%	1	14%	0	0%	7
Total	111	78%	8	6%	11	8%	10	7%	3	2%	143

Table 12 highlights that 95% (143 of 151) of patients received systemic corticosteroids for their exacerbation, whilst 5% (8 of 151) did not receive them.

The analysis of those who received systemic corticosteroids, outlined in Table 13, identified that 78% (111 of 143) of patients received them prior to their admission to the ward. Of the remainder, 6% (8 of 143) of patients received their corticosteroids within the first hour of admission, 8% (11 of 143) between 1-4 hours of admission, 7% (10 of 143) between 4-24 hours of admission and the final 2% (3 of 143) did not receive corticosteroids until more than 24 hours following their admission.

Discharge Planning and Follow up

If there are smokers in the household, is there a record that smoking cessation was offered to these smokers?

Table 14: Offer of smoking cessation to smokers in the patient's household, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	Total
TRUST A	1	11%	8	89%	9
Hospital 1	1	11%	8	89%	9
TRUST B	3	38%	5	63%	8
Hospital 2	1	50%	1	50%	2
Hospital 3	2	33%	4	67%	6
TRUST C	0	0%	1	100%	1
Hospital 5	0	0%	1	100%	1
TRUST D	1	13%	7	88%	8
Hospital 6	0	0%	5	100%	5
Hospital 7	1	33%	2	67%	3
TRUST E	0	0%	5	100%	5
Hospital 8	0	0%	4	100%	4
Hospital 9	0	0%	1	100%	1
Total	5	16%	26	84%	31

Graph 6: Offer of smoking cessation to smokers in the patient's household, by HSCT and hospital

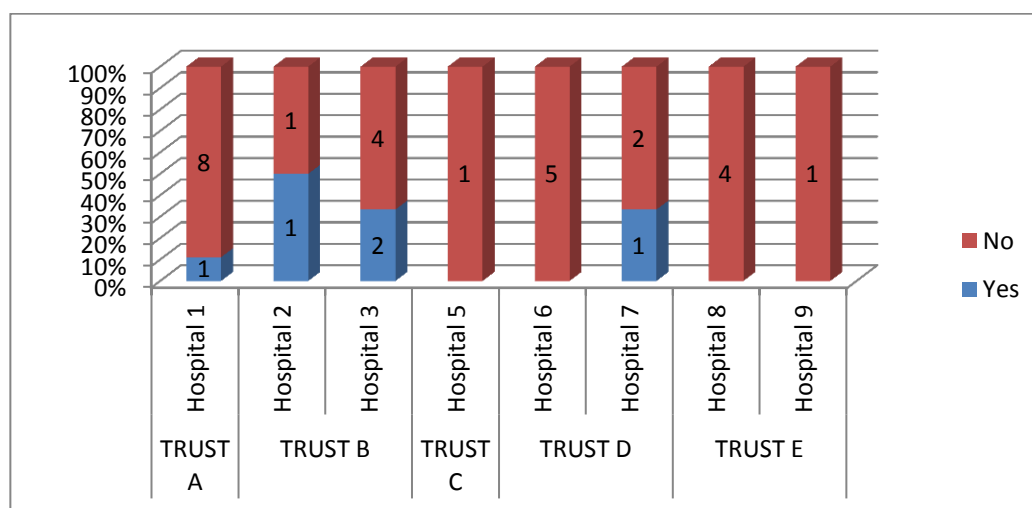


Table 14 and Graph 6 shows that 16% (5 of 31) of smoking household members of children and young people admitted with an acute asthma attack appear to have received smoking cessation advice. Trust B had the highest level of smoking cessation advice offered, whilst in some HSCTs no patients' smoking household members, e.g. parents, were recorded as receiving any smoking cessation advice.

Was patient on medium/high dose ICS before discharge and if yes, was there documented evidence that the patient was given a corticosteroid alert card?

Table 15: Patients on medium/ high dose ICS by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	Total
TRUST A	1	3%	34	97%	35
Hospital 1	1	3%	34	97%	35
TRUST B	3	14%	19	86%	22
Hospital 2	3	27%	8	73%	11
Hospital 3	0	0%	11	100%	11
TRUST C	2	12%	15	88%	17
Hospital 4	0	0%	1	100%	1
Hospital 5	2	13%	14	88%	16
TRUST D	2	4%	46	96%	48
Hospital 6	1	4%	26	96%	27
Hospital 7	1	5%	20	95%	21
TRUST E	2	7%	27	93%	29
Hospital 8	1	5%	18	95%	19
Hospital 9	1	10%	9	90%	10
Total	10	7%	141	93%	151

Table 16: Provision of corticosteroid alert card for relevant patients, by HSCT and hospital

TRUST & Hospital	No	%	Total
TRUST A	1	100%	1
Hospital 1	1	100%	1
TRUST B	3	100%	3
Hospital 2	3	100%	3
TRUST C	2	100%	2
Hospital 5	2	100%	2
TRUST D	2	100%	2
Hospital 6	1	100%	1
Hospital 7	1	100%	1
TRUST E	2	100%	2
Hospital 8	1	100%	1
Hospital 9	1	100%	1
Total	10	100%	10

Table 15 illustrates that 7% (10 of 151) of patients were taking medium/ high dose ICS before discharge.

Table 16 shows that, of the 10 patients who were taking medium/high dose ICS before discharge none received a corticosteroid alert card.

Was there a record that the patient’s inhaler technique was checked?

Table 17: Record of inhaler technique being checked, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	Total
TRUST A	28	80%	7	20%	35
Hospital 1	28	80%	7	20%	35
TRUST B	12	55%	10	45%	22
Hospital 2	5	45%	6	55%	11
Hospital 3	7	64%	4	36%	11
TRUST C	13	76%	4	24%	17
Hospital 4	1	100%	0	0%	1
Hospital 5	12	75%	4	25%	16
TRUST D	42	88%	6	13%	48
Hospital 6	24	89%	3	11%	27
Hospital 7	18	86%	3	14%	21
TRUST E	14	48%	15	52%	29
Hospital 8	6	32%	13	68%	19
Hospital 9	8	80%	2	20%	10
Total	109	72%	42	28%	151

Graph 7 – Record of inhaler technique being checked, by HSCT and hospital

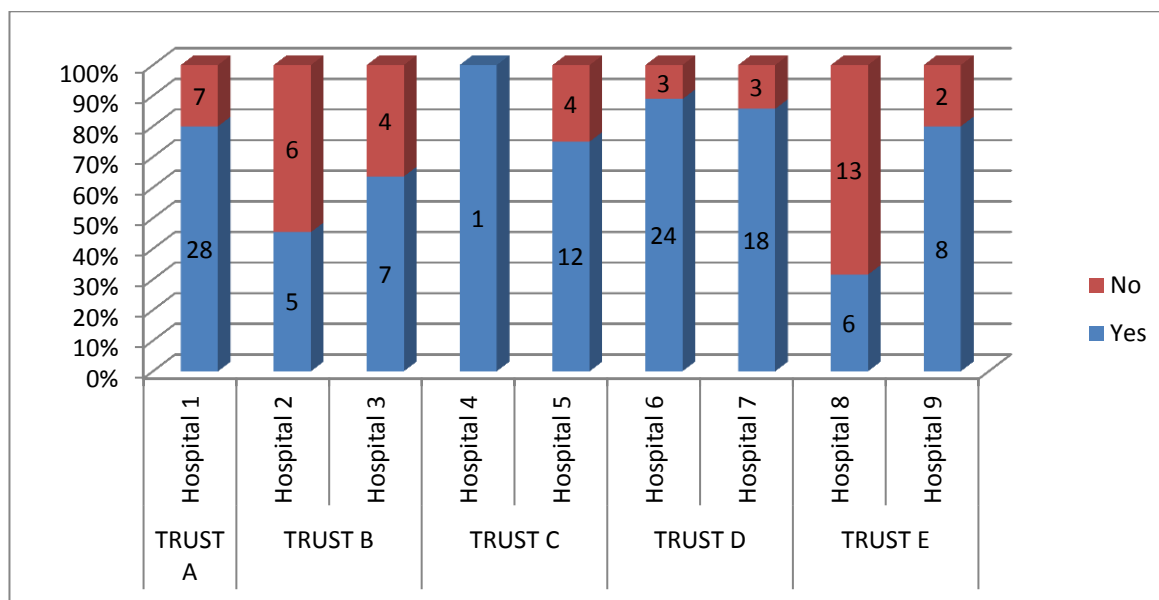


Table 17 and Graph 7 demonstrate that 72% (109 of 151) of patients had a record that their inhaler technique was checked during this care episode.

Was the patient given asthma information leaflets/materials?

Table 18: Provision of asthma information leaflets/ materials, by HSCT and hospital

TRUST & Hospital	Given	%	Given previously	%	Not given	%	Total
TRUST A	18	51%	4	11%	13	37%	35
Hospital 1	18	51%	4	11%	13	37%	35
TRUST B	6	27%	0	0%	16	73%	22
Hospital 2	4	36%	0	0%	7	64%	11
Hospital 3	2	18%	0	0%	9	82%	11
TRUST C	7	41%	0	0%	10	59%	17
Hospital 4	0	0%	0	0%	1	100%	1
Hospital 5	7	44%	0	0%	9	56%	16
TRUST D	21	44%	6	13%	21	44%	48
Hospital 6	19	70%	3	11%	5	19%	27
Hospital 7	2	10%	3	14%	16	76%	21
TRUST E	2	7%	0	0%	27	93%	29
Hospital 8	2	11%	0	0%	17	89%	19
Hospital 9	0	0%	0	0%	10	100%	10
Total	54	36%	10	7%	87	58%	151

Graph 8: Provision of asthma information leaflets/materials, by HSCT and hospital

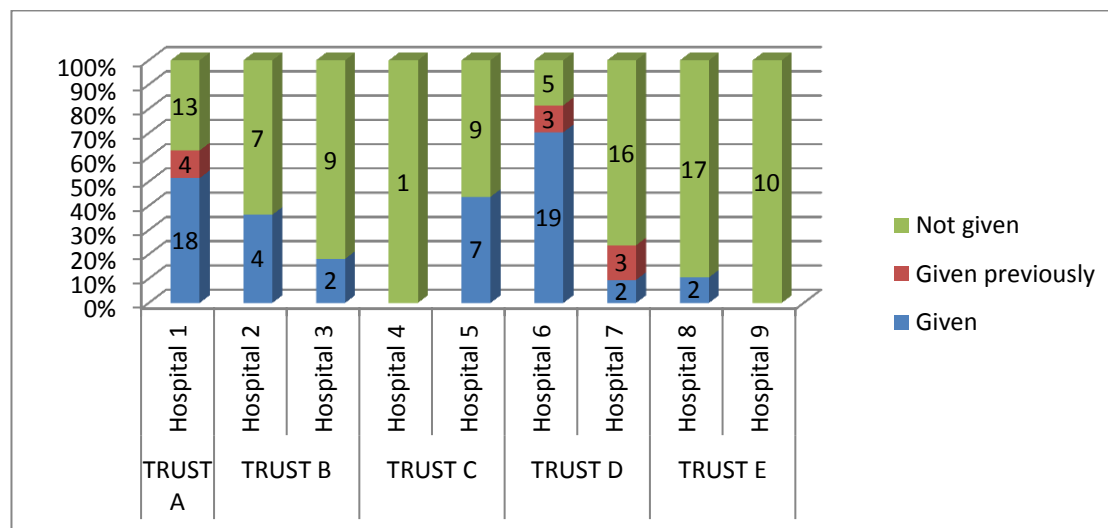


Table 18 and Graph 8 demonstrate that 43% (64 of 151) of patients were provided with asthma information material either during the admission or on a previous occasion. In some hospitals, no patients received any information materials (Hospitals 4 and 9).

Was a written action plan given or reviewed during admission?

Table 19: Written action plan given or reviewed, by HSCT and hospital

TRUST & Hospital	Given	%	Reviewed	%	Not given or reviewed	%	Total
TRUST A	18	51%	1	3%	16	46%	35
Hospital 1	18	51%	1	3%	16	46%	35
TRUST B	9	41%	1	5%	12	55%	22
Hospital 2	6	55%	1	9%	4	36%	11
Hospital 3	3	27%	0	0%	8	73%	11
TRUST C	12	71%	1	6%	4	24%	17
Hospital 4	0	0%	0	0%	1	100%	1
Hospital 5	12	75%	1	6%	3	19%	16
TRUST D	35	73%	2	4%	11	23%	48
Hospital 6	23	85%	2	7%	2	7%	27
Hospital 7	12	57%	0	0%	9	43%	21
TRUST E	9	31%	2	7%	18	62%	29
Hospital 8	7	37%	2	11%	10	53%	19
Hospital 9	2	20%	0	0%	8	80%	10
Grand Total	83	55%	7	5%	61	40%	151

Graph 9: Written action plan given or reviewed, by HSCT and hospital

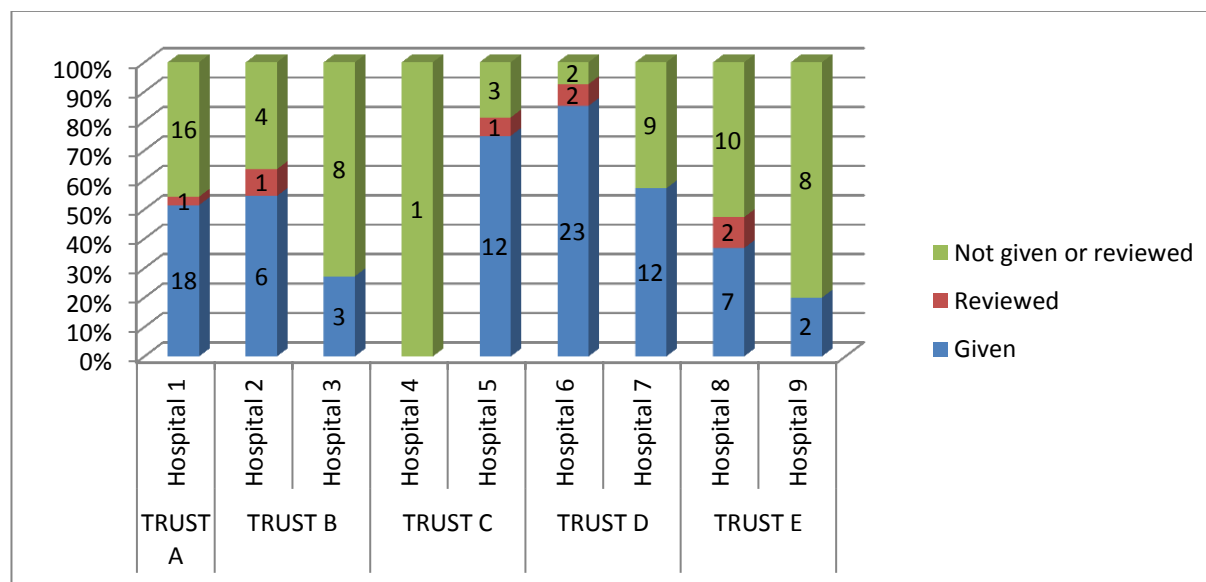


Table 19 and Graph 9 demonstrate that 60% (90 of 151) of patients had an action plan either given or reviewed during their admission. Hospitals 5 and 6 had the highest levels of action plans given or reviewed; 81% (13 of 16) and 92% (25 of 27) respectively.

Was early review (within 14 days) arranged and if yes, who was it arranged with?

Table 20: Confirmation of early review, by HSCT and hospital

TRUST & Hospital	Yes	%	No	%	Total
TRUST A	22	63%	13	37%	35
Hospital 1	22	63%	13	37%	35
TRUST B	10	45%	12	55%	22
Hospital 2	7	64%	4	36%	11
Hospital 3	3	27%	8	73%	11
TRUST C	12	71%	5	29%	17
Hospital 4	1	100%	0	0%	1
Hospital 5	11	69%	5	31%	16
TRUST D	36	75%	12	25%	48
Hospital 6	24	89%	3	11%	27
Hospital 7	12	57%	9	43%	21
TRUST E	9	31%	20	69%	29
Hospital 8	2	11%	17	89%	19
Hospital 9	7	70%	3	30%	10
Total	89	59%	62	41%	151

Table 21: Who early review was arranged with, by HSCT and hospital

TRUST & Hospital	Hospital (Asthma specialist nurse)		GP		Hospital (Consultant led OPC)		Total
		%		%		%	
TRUST A	2	9%	20	91%	0	0%	22
Hospital 1	2	9%	20	91%	0	0%	22
TRUST B	0	0%	10	100%	0	0%	10
Hospital 2	0	0%	7	100%	0	0%	7
Hospital 3	0	0%	3	100%	0	0%	3
TRUST C	3	25%	9	75%	0	0%	12
Hospital 4	0	0%	1	100%	0	0%	1
Hospital 5	3	27%	8	73%	0	0%	11
TRUST D	0	0%	34	94%	2	6%	36
Hospital 6	0	0%	22	92%	2	8%	24
Hospital 7	0	0%	12	100%	0	0%	12
TRUST E	6	67%	3	33%	0	0%	9
Hospital 8	1	50%	1	50%	0	0%	2
Hospital 9	5	71%	2	29%	0	0%	7
Total	11	12%	76	85%	2	2%	89

Graph 10: Who early review was arranged with, by HSCT and hospital



Table 20 shows that 59%, (89 of 151) of patients had a review arranged within 14 days of discharge.

Table 21 and Graph 10 illustrate that 85% (76 of 89) of reviews had been arranged with the GP and 12% (11 of 89) by the hospital based asthma specialist nurse. A small number, 2% (2 of 89) had a review arranged with the hospital (consultant led outpatient clinic).

Observations and discussion

This audit examined the management of acute exacerbations of asthma in 151 children and young people who were admitted to hospital between September 2015 and November 2015. Demographics of the audit sample showed that 61% (92 of 151) of patients were male. Patients tended to be aged between 2 and 12, 88% (113 of 151).

In relation to previous admissions due to asthma, the audit found that 68% (103 of 151) of patients had not had a previous admission for 12 months or more. Seventeen percent (25 of 151) had been admitted in the previous 3-12 months due to asthma and 9% of patients (14 of 151) had more recent previous admissions due to asthma, i.e. within the previous 1-3 months. The remaining 6% (9 of 151) of patients had been admitted within the past month. Making best possible use of good discharge planning in future should help to prevent any child being readmitted as frequently as this.

On admission, approximately one third, 36% (54 of 151) of patients had oxygen saturation levels less than 92%, classifying their acute episode as 'severe' according to the BTS/SIGN guideline ⁴.

The BTS/SIGN guideline advises that inhaled corticosteroids are the first line regular preventer treatment for children with asthma; however, Leukotriene Receptor Antagonist Therapy (LTRA) can also be used as an alternative in children under 5 years of age ⁴.

The results of this audit showed that 60% (90 of 151) of patients were taking regular inhaled corticosteroids prior to the acute event. Twelve percent (18 of 151) of patients had been prescribed the treatment but were not using it in the intended manner, 10% were using either beta 2 agonist only or LTRA and the remaining 19% (28 of 151) were newly diagnosed at the time of discharge home. Seventy percent (43 of 61) of those patients not on regular ICS before admission were commenced on regular preventer therapy prior to discharge.

The reasons behind non-adherence to prescribed medication are multifactorial and are influenced by patients' understanding, parental supervision and guidance in the case of children, embarrassment or denial in the case of young people, competing priorities where individuals or families struggle with more than one challenge and practical difficulties in inhaler technique or remembering to take regular treatment for an illness that at times appears to cause no apparent problems.

Assessment of adherence to medication was recorded in 46% (62 of 135) of patients prior to admission. As part of a supported self-management plan, BTS/SIGN advise that all patients with long term asthma should have their adherence regularly assessed by clinical staff to ensure treatment is used effectively which can work to prevent potentially fatal acute exacerbations of asthma. This requires improvement (see recommendations and action plan)⁴.

Systemic corticosteroids are meant to be given early in the management of an acute exacerbation of asthma to prevent worsening of symptoms and reduce the risk of patients needing hospital admission⁴. In this audit 95% (143 of 151) of patients received systemic corticosteroids and 5% (8 of 151) did not. The majority of those patients receiving systemic corticosteroids, 78% (111 of 143) did so prior to being admitted to the ward (either whilst in ED or from the GP OoH service), and a further 6% (8 of 143) received these drugs within the first hour of admission; these findings show that treatment is mainly being administered at the earliest opportunity, in line with guidelines. However, 17% (24 of 143) did not receive treatment early, i.e. prior to admission to the ward or within one hour of admission, and the importance of this needs to be impressed on staff treating these children and young people.

Of the 31 patients who lived with smokers in the household, 16% (5 of 31) had smoking cessation advice offered to that family member. Recommendations for best practice advise that; as part of a discharge plan these patients should be assessed with regards to environmental exposure to tobacco smoke and family members referred to appropriate agencies were necessary⁴. As smoking cessation advice was offered to only a small number of families who needed it, this is an area where improvements are required, as environmental tobacco smoke worsens asthma¹.

Seven percent (10 of 151), of patients were discharged on medium/high dose inhaled corticosteroids; however, none of these patients received a steroid alert card before discharge. In some cases, the patient may already have been in possession of a steroid alert card, or it may have been issued by the hospital pharmacy department and not documented by ward staff. However, this does not compensate for an apparent poor level of performance, which may be due to lack of awareness of the importance of providing these alert cards. It would therefore be useful to gather information on staff awareness of this requirement as part of the discharge plan and identify reasons why children and young patients do not receive these cards, which are intended to alert other care providers to look

out for side effects and interactions with other treatments involving corticosteroids especially in medium to high doses, to improve patient safety.

Since this audit, there has been agreement within NIPRAN that steroid alert cards should be provided for only those patients on high dose inhaled corticosteroids.

Forty three percent (64 of 151) of patients received information leaflets/materials on managing their asthma, prior to discharge. The reasons for this could be: patients already had adequate information, staff not finding time or opportunity to attend to this aspect of patient care or not considering it an effective intervention. This requires further exploration before deciding on appropriate actions.

Seventy two percent (109 of 151) of patients had a record that their inhaler technique was checked. This is an important part of the discharge process to promote effective medication use and prevent future exacerbations. Sixty percent (90 of 151) of patients either received or had an existing written action plan reviewed prior to discharge. According to the BTS/SIGN guideline, assessing inhaler technique and provision/review of written action plans are both fundamental elements of the discharge process, and therefore should be incorporated into the discharge plan of every asthma patient following an acute exacerbation, as they support effective self-management, which is important in all long term conditions and especially so in children and young people, whose capacity to do so changes continually as they grow up ⁴.

Fifty nine percent (89 of 151) of patients had an early review arranged, defined as within 14 days from the acute event, and in the majority of patients this was with their GP, 85% (76 of 89), rather than the secondary care asthma specialist nurse, 12% (11 of 89). A small number, 2% (2 of 89) had review arranged with the hospital consultant led outpatient clinic. The small number of reviews with the secondary care asthma specialist nurse may be due, in part, to a lack of availability in some hospitals, and further detail on the reasons behind this will be useful. Early reviews improve communication between care providers in different settings and with patients and offer another opportunity to ensure patients are supported, informed and capable of self-management and self-care to optimise their response to treatment.

Limitations of Audit

There are several limitations to the findings of this audit, which may affect the results discussed. The sample size is small, and results may not be reflective of the entire population of paediatric asthma patients in Northern Ireland.

The audit was undertaken from September 2015 to November 2015, and therefore seasonal variations in patient presentation and management could not be investigated and may have influenced the overall standard of care received by patients in this audit.

Due to logistical and resource constraints, it was not possible to extend the audit to primary care settings, which are an integral part of the patient pathway and where most care of asthma patients takes place. This leaves significant gaps in the learning that can be taken from this audit for service quality improvement and development.

Recommendations

Recommendations can be made on current practice for the assessment, management and follow-up of children and young patients admitted to hospital with an exacerbation of asthma.

1. All patients need to receive a written management plan or have a review of an existing plan prior to discharge with clear instructions on how to use medication and advice on how to manage worsening symptoms.
2. Early review within 14 days for children and young patients who have experienced an acute exacerbation of asthma leading to assessment in ED or admission to hospital is advised to ensure proactive management to reduce the likelihood of further episodes.
3. HSCTs should identify whether corticosteroid alert cards are available in clinical areas and also provide education for clinical staff about the importance of steroid alert cards.
4. Adherence to prescribed medication should be checked regularly by clinical staff as part of a self-management plan in order to identify those patients and their parents/carers/guardians who might require further education or support with regards to the patient's treatment.
5. Awareness sessions and training should be provided for clinical staff to enhance awareness of the importance of early administration of medication as per BTS/SIGN guidelines.
6. Smoking cessation advice should be provided for family members in order to reduce the likelihood of patients suffering future asthma exacerbations.
7. The results of this audit should be widely distributed to all HSCTs and HSC Professionals through the Respiratory Forum.
8. All HSCTs should develop an action plan to address challenges identified in this audit.

3. Clinical Audit Plan

Project Number:

KEY (Change status)

1. Recommendation agreed but not yet actioned
2. Action in progress
3. Recommendation fully implemented
4. Recommendation never actioned (please state reasons)
5. Other (please provide supporting information)

Project title	<i>Northern Ireland Asthma Audit</i>		
Action plan lead	Name: <i><Enter Trust lead></i>	Title:	Contact:

Ensure that the recommendations detailed in the action plan mirror those recorded in the “Recommendations” section of the report. The “Actions required” should specifically state what needs to be done to achieve the recommendation. All updates to the action plan should be included in the “Comments” section.

Recommendation	Actions required (specify “None”, if none required)	Action by date	Person responsible (Name and grade)	Comments / action status (Provide examples of action in progress, changes in practices, problems encountered in facilitating change, reasons why recommendation has not been actioned etc)	Change stage (see Key)
1. All HSC Trusts should ensure adherence to prescribed medication should be checked regularly by clinical staff as part of a self-management plan in order to identify those patients and their parents/ carers/ guardians who might require further education or support with regards to the patient’s treatment.	HSC Trusts to develop plan to action recommendation				

<p>2. All HSC Trusts should ensure that awareness sessions and training should be given to clinical staff to enhance awareness of the importance of early administration of medication as per BTS/SIGN guidelines.</p>	<p>HSC Trusts to develop plan to action recommendation</p>				
<p>3. All HSC Trusts should ensure that smoking cessation advice should be provided for family members in order to reduce the likelihood of patients suffering future asthma exacerbations.</p>	<p>HSC Trusts to develop plan to action recommendation</p>				
<p>4. All HSC Trusts should identify whether corticosteroid alert cards are available in clinical areas and also provide education for clinic staff about the importance of steroid alert cards.</p>	<p>HSC Trusts to develop plan to action recommendation</p>				
<p>5. All Trusts should ensure that all patients receive a written management plan or have a review of an existing plan prior to discharge with clear instructions on how to use medication and advice on how to manage worsening symptoms.</p>	<p>HSC Trusts to develop plan to action recommendation</p>				
<p>6. Early review within 14 days of children and young people who have</p>	<p>HSC Trusts to develop plan to</p>				

experienced an acute exacerbation of asthma leading to assessment in ED or admission to hospital is advised to ensure proactive management to reduce the likelihood of further episodes.	action recommendation				
7. The results of this audit should be widely distributed to all HSCTs and HSC Professionals through the Respiratory Forum.	Respiratory Forum to distribute audit report				
8. All HSCTs should develop an action plan to address challenges identified in this audit.	Trusts to return completed action plans to the audit group				

Audit Project Team

Name	Designation	Organisation
Muhammad Sartaj	Public health consultant	PHA
Wendy Thornton	Project manager	PHA
Robert Mercer	Regional Audit Facilitator	RQIA
Mike Shields	Paediatric respiratory consultant	BHSCT
Katy McConnell	Paediatric trainee	BHSCT
Jenny Hughes	Consultant Paediatrician	NHSCT
Lisa English	Paediatric respiratory nurse	NHSCT
Lynsey Orr	Paediatric trainee	NHSCT
Kathy Dunlop	Consultant paediatrician	SEHSCT
Mike Smith	Paediatric respiratory consultant	SHSCT
Dawn Addis	Respiratory allergy nurse	SHSCT
Rebecca Harte	Paediatric respiratory Nurse	WHSCT
Michaela McCauley	Paediatric respiratory Nurse	WHSCT

Paediatric Asthma audit 2016

Setting: In-Patients

Data collection tool (Draft 6 - November 2016)

No.	Audit question	Answer
1	HSC Trust <i>*will only be kept on master copy for reference only. Secured under data protection</i>	Enter Trust:
2	Hospital Site <i>*will only be kept on master copy for reference only. Secured under data protection</i>	Enter hospital site:
3	Patient HCN <i>*will only be kept on master copy for reference only. Secured under data protection</i>	Enter patient HCN:
4	Date this patient was admitted to hospital: (dd/mm/yy)	Enter date:
5	Patient's age:	Enter age:
6	Patients sex:	Male / Female:
KEY INCLUSION CRITERIA		
Primary diagnosis of asthma on admission to paediatric ward in hospital		
Period being audited: Admissions in Sept / Oct / Nov 2015		
BTS guidance: Assessment at admission and management in hospital		
7	Please state patient's most recent previous admission to hospital for asthma:	Within past month / Past 1-3 months / Past 3 months to 1 year / Never prev. admitted or 1yr +
8a	Was SaO2 greater than 92% room air on admission?	First measured on room air / Yes / No
8b	If no, please state reason:	First measured on oxygen / Other / NA
8c	Was SaO2 measured post bronchodilation?	Yes / No / NA
9a	Were systemic corticosteroids given during this exacerbation?	Yes / No
9b	If yes, please specify timeframe in which they were FIRST given during this episode:	Prior to admission to ward (eg in ED/OoH) / Within 1 hour of admission / between 1 - 4 hrs of admission / between 4 - 24 hrs of admission / 24hrs + / NA
10a	Are there cigarette smokers in the child's home environment?	Yes / No / Not recorded
10b	If yes, is there a record that smoking cessation was offered?	Yes / No / NA
11a	Was an assessment of the patient's adherence to prescribed medication made during this admission?	Yes / No / NA
11b	If yes, how was this done?	NIECR Check / GP confirmation / Verbal report from family / NA
11c	If poor compliance was suspected, was this addressed with the patient / family?	Yes / No / NA
BTS guidance: Discharge from hospital		
12a	Was the patient taking inhaled corticosteroids (ICS) regularly before admission? (Regularly = for at least 1 month)	Yes / No (new diagnosis) / No (poor concordance) / No (beta agonist or Montelukast only)
12b	If the answer was yes, were ICS increased before discharge?	Yes / No / NA
12c	If the answer was no, beta agonist or Montelukast only, were ICS started before discharge?	Yes / No / NA
13a	Was this patient on medium/high dose ICS before discharge? (<i>***see below for definition of medium/high dose ICS***</i>)	Yes / No
13b	If yes, was there documented evidence that this patient was given a steroid alert card?	Yes / No / NA
14a	Was the patient taking any other prophylaxis (not ICS) at discharge?	Yes / No
14b	If yes, what type?	Long acting beta 2 agonist / Montelukast / Theophylline / NA
15	Was the patient's inhaler technique checked?	Yes / No / Not on inhalers
16	Was the patient given asthma information leaflets / materials?	Given / Given previously / Not given
17	Was a written action plan given or reviewed?	Given / Reviewed / Not given or reviewed
BTS guidance: Follow-up		
18a	Was early review (within 14 days) arranged?	Yes / No
18b	If yes, who was early review (within 14 days) arranged with?	GP / Asthma nurse / Hospital / not specified

***Definition of medium/high dose ICS:

Beclometasone dipropionate	
Non-proprietary	200mcg - 2 puffs twice a day
Clenil Modulite	200mcg - 2 puffs twice a day
Qvar extrafine / autohaler / Easi-breathe	100mcg - 2 puffs twice a day
Ciclesonide	
Alvesco Aerosol inhaler	160mcg - 2 puffs once a day
Fluticasone propionate	
Flixotide Evohaler	125mcg - 2 puffs twice a day
Beclometasone	
Asmabec	100mcg - 2 puffs twice a day
Budesonide	
Non-proprietary Easyhaler	200mcg - 2 puffs twice a day
Pulmicort Turbohaler	200mcg - 2 puffs twice a day / 400mcg one puff twice a day
Fluticasone propionate	
Flixotide Acchaler	250mcg one puff twice a day



The Regulation and Quality Improvement Authority

9th Floor

Riverside Tower

5 Lanyon Place

BELFAST

BT1 3BT

Tel 028 9536 1111

Email info@rqia.org.uk

Web www.rqia.org.uk

 [@RQIANews](https://twitter.com/RQIANews)