



Royal College
of Physicians

NACAP

National Asthma and Chronic Obstructive
Pulmonary Disease Audit Programme (NACAP)

Children and young people asthma clinical audit 2019/20

Children and young people with asthma attacks admitted
to hospitals in England, Scotland and Wales from 1 June 2019
and discharged by 31 January 2020

**Clinical audit: data analysis
and methodology report**

Published May 2021



In association with:

Commissioned by:



British
Thoracic
Society

Imperial College
London



Royal College of
General Practitioners



HQIP

Healthcare Quality
Improvement Partnership

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NACAP

NACAP is a programme of work that aims to improve the quality of care, services and clinical outcomes for patients with asthma and COPD in England, Scotland and Wales. Spanning the entire patient care pathway, NACAP includes strong collaboration with asthma and COPD patients, as well as healthcare professionals, and aspires to set out a vision for a service which puts patient needs first. To find out more about the NACAP visit: www.rcplondon.ac.uk/nacap

Children and young people asthma: 2019/20 annual clinical report

This report was prepared by the following people, on behalf of the NACAP asthma advisory group (the full list of members can be found on the NACAP resources page: www.rcplondon.ac.uk/nacap-cyp-asthma-resources)

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Citation for this report: Sinha I, Latchem S, Amusan L, Andrews R, Afful S, Imoedemhe E, Yassin N, Bunning T, Adamson A, Stone P, Quint J, Roberts MC. *National Asthma and COPD Audit Programme: Children and young people asthma secondary care clinical audit 2019/20. Clinical audit: Data analysis and methodology report.* London: RCP, 2021.

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ISBN: 978-1-86016-829-1

eISBN: 978-1-86016-830-7

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How to use this report

1. Scope and data collection

This report presents the results from an analysis of data derived from the children and young people (CYP) asthma clinical audit component of the National Asthma and COPD Audit Programme (NACAP). This continuous clinical audit, which captures the process and clinical outcomes of treatment in children and young people (aged 1–18 years) who have been admitted to hospital paediatric services in England, Scotland and Wales with asthma attacks, launched on 1 June 2019.

This report, which is the first report post-launch of continuous data collection, presents data describing the care of 8,506 children and young people who arrived at hospital on or after 1 June 2019, were admitted to paediatric services, **and** were discharged by 31 January 2020.

Contributing to the overarching national QI objectives of NACAP, this report aims to empower stakeholders to use audit data to facilitate improvements in the quality of care.

2. Report structure

These data are presented largely in tabular form with explanatory notes where appropriate. The key standards and messages can be found at the beginning of each section, in addition to the combined audit report (www.rcplondon.ac.uk/nacap-cyp-asthma-2019/20). These data will also be made publicly available at hospital level on the report webpages (link above) and www.data.gov.uk, in line with the government's transparency agenda.

Details of the statistical, data collection and information governance methodologies used are provided in **Appendix A**.

Nationally benchmarked results for participating hospitals across England, Scotland and Wales have been provided in **section 6** of the report. The median values for each hospital are presented alongside the national medians for each indicator. Hospital-level results are colour coded in accordance with whether the hospital falls within the upper quartile, the middle two quartiles or the lower quartile.

Alongside the publication of this report, participating hospitals will also be provided site-level reports, presenting their own hospital-level data against both the national and country national average. These reports are provided directly to the hospital responsible for participation in the NACAP CYP audit via the NACAP web tool (www.nacap.org.uk).

In addition, an addendum to the clinical audit aspect of this report will be published in 2021, detailing 30- and 90-day mortality and hospital readmission rates. The two reports together are designed to provide a picture of the care provided to the cohort of CYP asthma patients admitted to hospital with an asthma attack who were included in the audit, as well as their outcomes post-discharge. In each future round of reporting, the NACAP aims to provide an increasingly comprehensive picture of asthma care provided across the country as case ascertainment builds over the length of the continuous audit.

3. Report coverage and data validation

The data presented in this report are based on the first 8 months of continuous clinical audit data collection from hospitals in England, Scotland and Wales who participated in the audit and entered data into the NACAP web tool.

Because of the truncated size of this cohort, caution must be taken in interpreting analyses where the sample size is small as analyses may be underpowered and associations seen may occur by chance. Other potential sources of bias exist as CYP do not represent a random sample and no case mix adjustment has been undertaken.

National breakdowns in this round of reporting do not account for Scotland. Scottish audit data are included in the 'All' figures but are not presented separately in this report like England and Wales.

The low rate of recruitment to the audit in Scotland provided small numbers (105 cases) that cannot be meaningfully analysed as a representative sample of the care received by Scottish CYP. Scottish participation in the NACAP CYP ceased in March 2020 following the discontinuation of commissioning for some major elements of the **National Clinical Audit and Patient Outcomes Programme (NCAPOP)**.

The NACAP follows rules on suppression of small numbers (any number less than 5) in national reporting where it may be possible to identify an individual CYP in the data presented. Any numerators between 1–4 have been replaced with <5 and the corresponding percentage also removed. This approach has also been used in the hospital level benchmarking table presented in **Section 6**.

Data validation

The publication of this report was delayed after we identified some anomalies in the numbers of CYP included in the audit when compared with Hospital Episodes Statistics (HES), National Records of Scotland and Information Services Division (ISD) Scotland and NHS Wales Informatics Service (NWIS) data. Specifically, the numbers of CYP entered into the audit were higher than those recorded by HES.

After conducting some internal validation, we are confident that this does not compromise the validity of the audit or affect our main findings. We have explored this both with clinical teams who we have asked to re-audit cases for diagnostic accuracy and with HES, National Records of Scotland and ISD Scotland and NWIS to validate the extraction codes used. The main issues that have led to the discrepancy relate to coding and diagnoses written in the notes – particularly in pre-school children with wheeze. We anticipated this might be a problem because we know that defining diagnosis in this age group is an issue in clinical practice.

Following consultation and extensive discussion we have decided to take a pragmatic approach to this situation. In effect as an audit of clinical practice against guideline recommendations, if a senior clinician makes an admission diagnosis of asthma and enters the case into the audit then the clinical

practice associated with that case should be compared with the asthma guideline recommended practice (www.nice.org.uk/guidance/ng80/chapter/Recommendations#diagnosing-asthma-in-young-children).

We accept that within this cohort there will be some cases that will later not meet the diagnostic criteria for asthma but were treated for this condition. An audit does not require the same case inclusion rigour as a research project might and given the audit sample size this is unlikely to have a significant impact on the findings that relate to standards of care.

We are aware there is nationwide diagnostic uncertainty in the under 6s and we want to do what we can to capture this by adding wheeze diagnoses in the inclusion criteria for under 6s discharged from 1 April 2021.

In addition, for all CYP patients discharged from 1 April 2021 the inclusion criteria will be updated to include patients with a secondary diagnosis of asthma attack. We urge all audit participants of the need to include only cases with a primary or secondary diagnosis of an asthma attack. We also recommend that all clinical teams establish regular meetings with their coding teams to explore anomalies between clinical notes recording in asthma cases and its interpretation by coders that is used to inform HES, ISD Scotland and NWIS and data capture. Rather than shy away from this methodological problem, we intend to use NACAP as a way of stimulating better and clearer diagnosis in the notes. We continue to work with other national agencies to develop better diagnosis and coding strategies as a further benefit of this audit programme.

4. Audience and links to relevant guidelines and standards

The report is intended to be read by healthcare professionals, NHS managers, chief executives and board members, as well as service commissioners, policymakers, voluntary organisations and service users. We strongly advise that CYP asthma hospital teams discuss these findings between themselves, as well as with their colleagues in primary care, their commissioners and other relevant healthcare teams. Separate reporting outputs will be produced for patients and the public and will be available at: www.rcplondon.ac.uk/nacap-cyp-asthma-2019/20. Where a certain area of care has been highlighted as a patient priority (something of particular importance to patients) by the NACAP patient panel this is shown with the patient priority icon displayed below.



References to the appropriate BTS/SIGN 2016 Management of Asthma guidelines ([Appendix B](#)), National Institute for Health and Care Excellence (NICE) quality statements ([Appendix C](#)), the Royal College of Emergency Medicine (RCEM) moderate and severe clinical asthma audit 2016/17([Appendix D](#)), and the Royal College of Physicians (RCP) why asthma still kills: National Review of Asthma Deaths (NRAD) report recommendations ([Appendix E](#)), have been included in the key standards.

Copies of our dataset, as well as the resources supplied for the clinical audit and our good practice repository, can be found via our website: www.rcplondon.ac.uk/nacap-cyp-asthma-resources.

Recommendations

For providers of children and young people (CYP) asthma services

This report outlines three key national quality improvement (QI) priorities for providers of CYP asthma secondary care. They were chosen based on their strong evidence base and effectiveness for improving care and outcomes for CYP with asthma.



National QI priority C1: Record smoking status and exposure to second-hand smoke for **95%** of children and young people.^{1,4}



National QI priority C2: Administer systemic steroids within 1 hour of arrival at hospital to **95%** of children and young people aged 6 years old or over, who have not received systemic steroids as part of pre-hospital care.^{1,2,3}



National QI priority C3: Provide **95%** of children and young people with the following as part of their discharge bundle:

1. Review or issue of a personalised asthma action plan (PAAP).
2. Check of their inhaler technique.
3. A follow-up appointment in a paediatric asthma clinic requested within 4 weeks.

Clinical audit recommendations (CA)

CA1 Clinical teams should work with colleagues in their hospital(s) to ensure correct diagnosis and coding of children and young people being admitted with an asthma attack. This is particularly important for the pre-school age group where diagnosis of asthma is more challenging.⁶

Clinical teams should ensure that the following patients are entered into the audit: *

- > Children aged 1–5 who have a primary or secondary diagnosis of asthma or a primary diagnosis of wheeze as a reason for admission.
- > CYPs aged 6–18 who have a primary or secondary diagnosis of asthma as a reason for admission.

* The audit initially required hospitals to enter data for CYP patients with only a **primary diagnosis** of an **asthma attack** for patients discharged from 1 April 2021. However, as recommendation CA1 indicates, hospitals will be asked to include cases to the audit where CYP patients are admitted to hospital with:

- > **Children aged 1–5**
 - > J45.0 - Predominantly allergic asthma (primary OR **secondary** diagnosis)
 - > J45.1 - Nonallergic asthma (primary OR **secondary** diagnosis)
 - > J45.8 - Mixed asthma (primary OR **secondary** diagnosis)
 - > J45.9 - Asthma, unspecified (primary OR **secondary** diagnosis)
 - > J46 - Status asthmaticus (Includes: Acute severe asthma) (primary OR **secondary** diagnosis)
 - > R06.2 - Wheezing (primary diagnosis)
- > **CYPs aged 6–18**
 - > J45.0 - Predominantly allergic asthma (primary OR **secondary** diagnosis)
 - > J45.1 - Nonallergic asthma (primary OR **secondary** diagnosis)
 - > J45.8 - Mixed asthma (primary OR **secondary** diagnosis)
 - > J45.9 - Asthma, unspecified (primary OR **secondary** diagnosis)
 - > J46 - Status asthmaticus (Includes acute severe asthma) (primary OR **secondary** diagnosis)

For primary care providers

Clinical audit recommendations (CA)

CA2 Record smoking status and exposure to second-hand smoke in every child and young person's notes and ensure this becomes a routine question whenever they attend their GP about their asthma.^{1,5}

CA3 Complete personalised asthma action plan (PAAP) reviews and inhaler technique checks for all children and young people as part of their annual review and/or on issue of new inhalers.^{2,3}

For children and young people (CYP) living with asthma and their families and carers

Clinical audit recommendations (CA)

CA4 If you are admitted to hospital with an asthma attack there are some important things that you should know – you may want to discuss these with the team looking after you:

- > You should have a high dose of oral steroids within 1 hour of arriving at hospital (unless you had them before you came).
- > Someone should check that you know how to use your inhaler before you go home.
- > You should go home with an up-to-date personalised asthma action plan (PAAP). This might be a new plan, or someone checking your old plan to make sure it is right.
- > If you are admitted to hospital with an asthma attack, you should be seen in a few weeks in a hospital asthma clinic. There should be an expert involved in your care in this clinic, such as a specialist nurse.

In some instances, you may not be able to ask for this yourself. If this is the case, we recommend your parent or carer does this for you.



Section 1: Audit participation, admission, demographics, and risk factors

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Key standards:

- > **BTS/SIGN 2019 [6.2.3]:** People with asthma and parents/carers of children with asthma should be advised about the dangers of smoking and second-hand tobacco smoke exposure and should be offered appropriate support to stop smoking.¹
- > **NRAD 2014 [Organisation of NHS services – recommendation 2]:** Patients with asthma must be referred to a specialist if they have required more than two courses of systemic corticosteroids oral or injected in the previous 12 months or require management using British Thoracic Society (BTS) stepwise treatment 4 or 5 to achieve control.⁵

Key findings

Audit participation

- > **84%** of hospitals have entered data for the first continuous CYP asthma clinical audit.
- > **16%** of hospitals either did not register or were registered but did not submit any data.

Admission and demographics

- > The **median age** at admission was **6 years** (interquartile range [IQR] 4–10 years).
- > More male children and young people (CYP) (**60.1%**) were admitted for asthma attacks than female.
- > The majority of CYP presented to hospital in the afternoon and early evening. However, **22%** presented at night and in the early hours of the morning (22:00 to 06:00).

Socioeconomic status

- > **30.8%** of admissions were CYP living in the most socio-economically deprived areas, whereas **10.8%** were CYP from the least deprived.

Risk factors

- > Exposure to second-hand smoke was recorded in **57.7%** of admissions. Where it was recorded, **30.1%** of CYP were regularly exposed to second-hand smoke in the home.[†]
- > Recent history of rescue oral corticosteroid use (two or more in the past 12 months) was not recorded in **34.9%** of admissions; where it was recorded, **30.4%** of CYP had two or more courses of rescue oral corticosteroids in the previous 12 months.

Patient numbers included in the audit (case ascertainment)[‡]

- > The **overall case ascertainment figure** for the period 1 June 2019 to 31 January 2020 was **69.2%** (**8,506/12,289 admissions**).

[†] For further information of the effects of exposure to second-hand smoke, please refer to the Inside story: health effects of indoor air quality on children and young people report. www.rcpch.ac.uk/resources/inside-story-health-effects-indoor-air-quality-children-young-people

[‡] These percentages were calculated using admission figures as recorded by Hospital Episode Statistics (HES) for England, the Patient Episode Database for Wales (PEDW) and the electronic Data Research and Innovation Service (eDRIS) for Scotland. For more information on the methodology used to calculate this figure, please see [Appendix A](#).

- > **The case ascertainment figure in under 5s** for the period 1 June 2019 to 31 January 2020 was **34.1% (2,664/7,815 admissions)**.*
- > **The case ascertainment figure in 5–18 year olds** for the period 1 June 2019 to 31 January 2020 was **130.6% (5,842/4,474 admissions)**.

Case ascertainment was variable across participating hospitals.**

Data presented in the report should be interpreted taking into account that results are based on a non-random sample of eligible patients, rather than the full cohort of eligible individuals.

** Due to diagnostic uncertainty around whether a child presenting with acute wheeze had 'asthma' or an episodic wheeze associated with a viral illness, the following wheeze codes were included to the denominator when calculating the case ascertainment for under 5s:*

R06.2 Wheezing (only for children aged 1–4)

B34.9 Viral infection, unspecified – viral induced wheeze (only for children aged 1–4)

***The denominator used in the case ascertainment calculation for the over 5s is based on a primary or secondary (first and second position) asthma diagnosis as the reason for admission to hospital. Although the inclusion criteria for the audit states that patients should only be included if the patient has a **primary diagnosis** of asthma, we are aware that this was not always the case.*

Asthma attacks may occur later during an inpatient stay and we believe a possible reason for the 130.6% case ascertainment figure may be that clinicians are including these cases (asthma attack in the third and fourth position of diagnosis) in the audit for completeness despite the fact that their initial admission was not for asthma.

There is also a possibility that some of the younger children in the 5–18 group who had a primary diagnosis of wheeze were also included in the audit. Wheeze codes were however not included in the denominator for this age group.

Wheeze codes will therefore be added to the inclusion criteria for the audit for patients 1-5 years of age who have been discharged from 1 April 2021. In addition to this, all CYP asthma patients discharged from 1 April 2021 with a primary OR secondary diagnosis of asthma will be included in the audit. See recommendation CA1.

Note that in children over 6 years of age, regardless of their underlying phenotype, it is good practice to make a diagnosis of asthma and then code it as such.

Navigation

This section contains the following tables and graphs. If you are viewing this report on a computer, you can select the table that you wish to see from the list below.

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- > 1.3 Socio-economic status
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- > 1.4 Arrival
 - > 1.4.1 Median number of admissions per hospital
 - > 1.4.2 Day and time of arrival at hospital (All)
- > 1.5 Smoking status and exposure to second-hand smoke
 - > 1.5.1 Smoking status
 - > 1.5.2 Exposure to second-hand smoke
- > 1.6 Has the patient been prescribed more than two courses of rescue/emergency oral steroids in the past 12 months for acute attacks of asthma?

1.1 Age

Age at arrival	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Median (IQR*)	6 (4 to 10)	6 (4 to 10)	7 (4 to 10)

*Interquartile range

1.2 Gender

Gender	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Male	5,114 (60.1%)	4,886 (60.4%)	177 (56.9%)
Female	3,379 (39.7%)	3,201 (39.6%)	134 (43.1%)
Transgender	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other	0 (0.0%)	0 (0.0%)	0 (0.0%)
Not recorded	13 (0.2%)	<5	0 (0.0%)

1.3 Socio-economic status

1.3.1 Index of Multiple Deprivation measures by national quintile in England and Wales

Index of Multiple Deprivation (IMD)		% of audit sample living in each quintile of English or Welsh Index of Multiple Deprivation				
		Q1 (most deprived)	Q2	Q3	Q4	Q5 (least deprived)
2019/20	England (IMD*) (n=7,876)	2,820 (35.8%)	1,807 (22.9%)	1,238 (15.7%)	1,084 (13.8%)	927 (11.8%)
	Wales (WIMD**) (n=321)	99 (30.8%)	90 (28.0%)	48 (15.0%)	50 (15.6%)	34 (10.6%)

Indices of multiple deprivation are not directly comparable between countries.⁵

*Index of Multiple Deprivation, England

**Welsh Index of Multiple Deprivation

Fig 1. Percentage of audit cohort in each IMD quintile in England

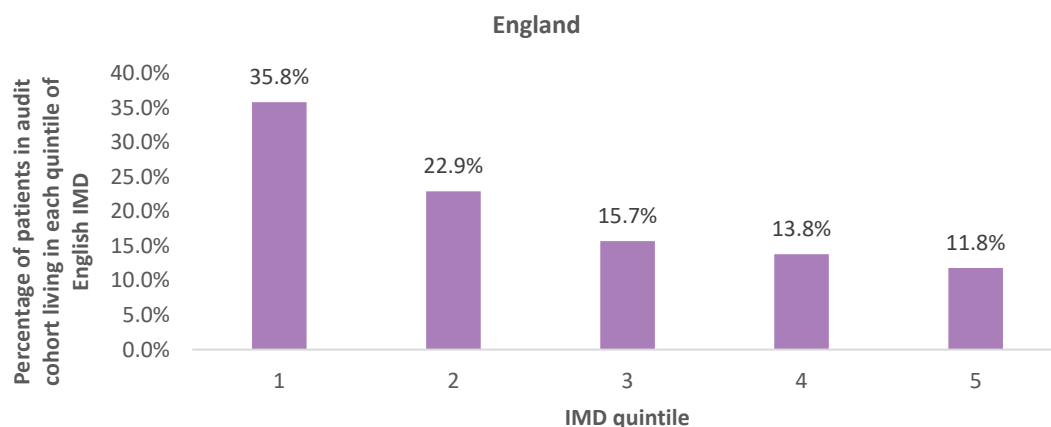
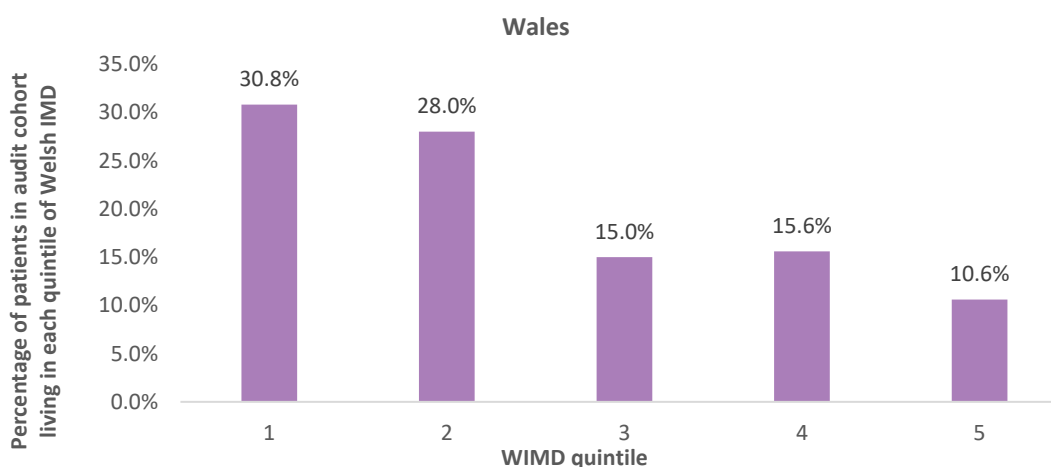


Fig 2. Percentage of audit cohort in each WIMD quintile in Wales



⁵https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/465791/English_Indices_of_Deprivation_2015_-_Statistical_Release.pdf

1.4 Arrival at hospital

1.4.1 Median number of admissions per hospital

Number of admissions	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Median (IQR)	48 (30 to 71)	48 (32 to 77)	40 (15 to 49)

1.4.2 Day and time of arrival at hospital (all)

Time of arrival	Day patient arrived (n=8,506)						
	Monday (n=1,497)	Tuesday (n=1,330)	Wednesday (n=1,198)	Thursday (n=1,102)	Friday (n=1,065)	Saturday (n=1,011)	Sunday (n=1,303)
00.00–01.59	83 (5.5%)	85 (6.4%)	70 (5.8%)	68 (6.2%)	52 (4.9%)	57 (5.6%)	60 (4.6%)
02.00–03.59	67 (4.5%)	46 (3.5%)	50 (4.2%)	43 (3.9%)	49 (4.6%)	49 (4.8%)	57 (4.4%)
04.00–05.59	58 (3.9%)	56 (4.2%)	41 (3.4%)	44 (4.0%)	53 (5.0%)	51 (5.0%)	48 (3.7%)
06.00–07.59	74 (4.9%)	66 (5.0%)	42 (3.5%)	43 (3.9%)	49 (4.6%)	41 (4.1%)	72 (5.5%)
08.00–09.59	112 (7.5%)	97 (7.3%)	65 (5.4%)	76 (6.9%)	72 (6.8%)	76 (7.5%)	85 (6.5%)
10.00–11.59	179 (12.0%)	151 (11.4%)	159 (13.3%)	133 (12.1%)	119 (11.2)	91 (9.0%)	137 (10.5%)
12.00–13.59	181 (12.1%)	156 (11.7%)	155 (12.9%)	142 (12.9%)	116 (10.9)	111 (11.0%)	136 (10.4%)
14.00–15.59	129 (8.6%)	126 (9.5%)	116 (9.7%)	88 (8.0%)	100 (9.4%)	95 (9.4%)	148 (11.4%)
16.00–17.59	179 (12.0%)	145 (10.9%)	144 (12.0%)	126 (11.4%)	123 (11.5)	122 (12.1%)	118 (9.1%)
18.00–19.59	190 (12.7%)	173 (13.0%)	148 (12.4%)	145 (13.2%)	134 (12.6)	95 (9.4%)	154 (11.8%)
20.00–21.59	140 (9.4%)	134 (10.1%)	113 (9.4%)	118 (10.7%)	105 (9.9%)	127 (12.6%)	160 (12.3%)
22.00–23.59	105 (7.0%)	95 (7.1%)	95 (7.9%)	76 (6.9%)	93 (8.7%)	96 (9.5%)	128 (9.8%)

Key


 Lowest (3.5%)

Highest (16.3%)

1.5 Smoking status of the child or young person, and their exposure to second-hand smoke

1.5.1 Smoking status

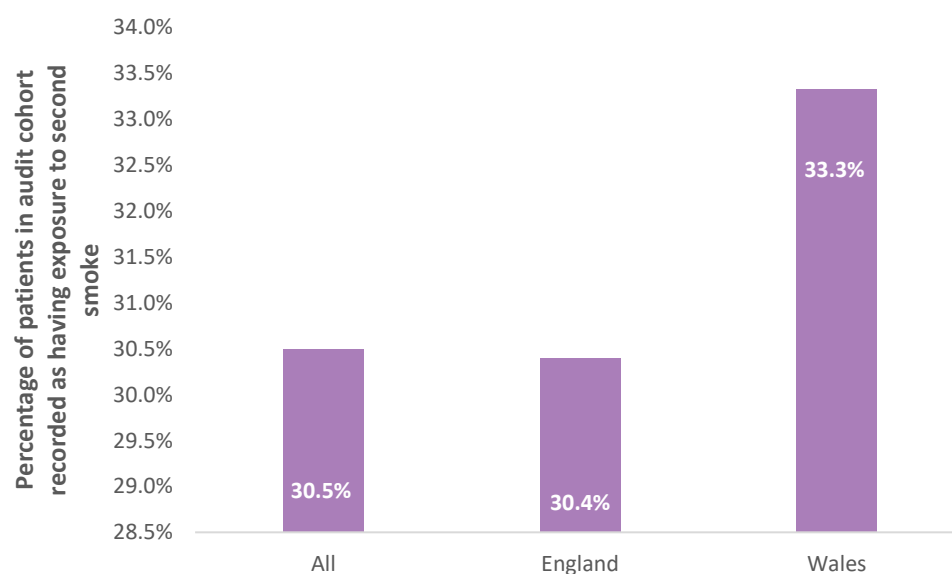
Reported smoking status	2019/20		
	All (n=1,946)	England (n=1,856)	Wales (n=63)
Not recorded	1,033 (53.1%)	992 (53.4%)	30 (47.6%)
Never smoked	827 (42.5%)	782 (42.1%)	32 (50.8%)
Current smoker	73 (3.8%)	70 (3.8%)	<5
Ex-smoker	10 (0.5%)	9 (0.5%)	0 (0.0%)
Ex-smoker and current vaper	0 (0.0%)	0 (0.0%)	0 (0.0%)
Never smoked and current vaper	<5	<5	0 (0.0%)

Smoking status was only recorded for patients over the age of 11 upon arrival at hospital

1.5.2 Exposure to second-hand smoke

Exposure to second-hand smoke	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Not recorded	3,594 (42.3%)	3,402 (42.1%)	134 (43.1%)
Yes	1,499 (17.6%)	1,423 (17.6%)	59 (19.0%)
No	3,413 (40.1%)	3,265 (40.4%)	118 (37.9%)

Fig 3. Percentage of patients recorded as having exposure to second-hand smoke



Denominator is patients who had their exposure to second-hand smoke recorded



National QI priority C1: Record smoking status and exposure to second-hand smoke for **95%** of children and young people.

Rationale:

Smoking and exposure to second-hand smoke is a big risk factor for acute asthma attacks and also for accelerated lung function decline and development of COPD later in life. Nicotine is one of the most addictive substances in the world** and specialist services are shown to improve rates of smoking cessation.

BTS/SIGN 2019 [6.2.3], NICE 2013 QS43 [QS2]

Tips to achieve this priority:

- > Survey staff working in the emergency department to understand the barriers to asking about smoking habits of CYP and parents on admission.
- > Develop tailored support and systems to overcome identified barriers.
- > Provide education and training to all staff on the importance of smoking or second-hand exposure as a risk for acute asthma attacks.

1.6 Has the patient been prescribed more than two courses of rescue/emergency oral steroids in the past 12 months for acute attacks of asthma?

Prescribed more than two courses of oral steroids	2019/20		
	All (n=8,470)	England (n=8,056)	Wales (n=311)
Not recorded	2,956 (34.9%)	2,786 (34.6%)	138 (44.4%)
Yes	1,679 (19.8%)	1,599 (19.8%)	48 (15.4%)
No	3,835 (45.3%)	3,671 (45.6%)	125 (40.2%)

** Pontieri FE, Tanda G, Orz, F, DiChiara G. Effects of nicotine on the nucleus accumbens and similarity to those of addictive drugs. *Nature* 1996; 382255-7 DOI: 10.1038/382255a0. <https://www.nature.com/articles/382255a0>



Section 2: Acute observations

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Key standards

- > **BTS/SIGN 2019 [9.7.2]:** Consider intensive inpatient treatment of children with oxygen saturations (SpO₂) <92% in air after initial bronchodilator treatment.¹
- > **BTS/SIGN 2019 [9.7.3]** PEF measurements can be of benefit in assessing children who are familiar with the use of such devices. The best three PEF measurements, ideally expressed as a percentage of a personal best, can be useful in assessing the response to treatment. A measurement of <50% predicted PEF or FEV₁ with poor improvement after initial bronchodilator treatment is predictive of a more prolonged asthma attack.¹
- > **BTS/SIGN 2019 [9.8.1]:** Children with life-threatening asthma or SpO₂ <94% should receive high-flow oxygen via tight-fitting face mask or nasal cannula at sufficient flow rates to achieve normal saturations of 94–98%.¹
- > **NICE 2013 QS25 [QS7]:** People with asthma who present with an exacerbation of their symptoms receive an objective measurement of severity at the time of presentation.²
- > **RCEM moderate and acute severe asthma 2016/17 [1a]:** Supplementary oxygen should be given on arrival to maintain saturations at 94–98%.³
- > **RCEM moderate and acute severe asthma 2016/17 [1b]:** Supplementary oxygen should be prescribed on arrival to maintain saturations at 94–98%.³

Key findings

Severity of the asthma attack

- > **66.8%** of CYP who were admitted to hospital with an asthma attack **presented with severe or life-threatening** features according to physiological variables and (where measured) peak expiratory flow rate (PEFR).
- > Peak expiratory flow rate (PEFR) was recorded in **19.5%** of admissions.

Navigation

This section contains the following tables and graphs. If you are viewing this report on a computer, you can select the table that you wish to see from the list below.

- > 2.1 Severity of asthma attacks as categorised by physiological parameters
 - > 2.1.1 Proportion of children with moderate and severe life-threatening asthma attacks (according to definition by physiological parameters in the British Thoracic Society/Scottish Intercollegiate Guidelines Network asthma guidelines)
- > 2.2 Oxygen saturation (SpO₂)
 - > 2.2.1 Did the patient have a SpO₂ measurement taken following arrival at hospital?
 - > 2.2.2 What was the first recorded oxygen saturation (SpO₂) measurement for the patient following arrival at hospital?
 - > 2.2.3 Was the measurement taken while the patient was on supplementary oxygen?
 - > 2.2.4 Was supplementary oxygen continued or commenced following the SpO₂ measurement?

- > 2.3 Peak expiratory flow rate (PEFR)
 - > 2.3.1 Number of patients with PEFR recorded

2.1 Severity of asthma attack as categorised by physiological parameters

Asthma attack severity was classified into 'moderate' and 'severe / life-threatening' according to the NICE guideline and BTS guideline thresholds. We have not evaluated a composite marker of severity in infants <2 years of age as the national guidelines do not suggest physiological thresholds for this age group. The audit dataset is limited to a subset of physiological variables provided in the NICE/BTS guidelines and therefore asthma attack severity categorisation here is indicative only.

The physiological variables used to categorise asthma attack severity of patients included in the audit were heart rate, respiratory rate, oxygen saturation (where measured) and peak expiratory flow rate (PEFR) where measured, in children aged >5 years. In addition, patients with a heart rate of less than 30 beats per minute or a respiratory rate of less than 10 breaths per minute were classified as severe. Patients recorded as 'Patient too unwell' for PEFR measurement, whose other physiological measurements were normal, were classified as severe.

2.1.1 Proportion of children with moderate and severe / life-threatening asthma attacks (according to definition by physiological parameters in the British Thoracic Society / Scottish Intercollegiate Guidelines Network asthma guidelines)

Asthma attack severity	2019/20		
	All (n=8,081)	England (n=7,679)	Wales (n=299)
Moderate	2,683 (33.2%)	2,527 (32.9%)	123 (41.1)
Severe and life-threatening	5,398 (66.8%)	5,152 (67.1%)	176 (58.9%)

Numerator is lower because severity was not assessed in children <2

2.2 Oxygen saturation (SpO₂)

2.2.1 Did the patient have a SpO₂ measurement taken following arrival at hospital?

SpO ₂ measurement taken on arrival	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Yes	8,455 (99.4%)	8,042 (99.4%)	310 (99.7%)
Not recorded	51 (0.6%)	48 (0.6%)	<5

2.2.2 What was the first recorded oxygen saturation (SpO₂) measurement for the patient following arrival at hospital?

First recorded SpO ₂ (%) on arrival	2019/20		
	All (n=8,455)	England (n=8,042)	Wales (n=310)
Median (IQR)	95 (93 to 97)	95 (93 to 97)	95 (93 to 97)
SpO ₂ ≤92%	2,038 (24.1%)	1,959 (24.4%)	57 (18.4%)

2.2.3 Was the measurement taken while the patient was receiving supplementary oxygen?

SpO ₂ while on supplementary oxygen	2019/20		
	All (n=8,455)	England (n=8,042)	Wales (n=310)
Yes	599 (7.1%)	578 (7.2%)	13 (4.2%)
No, room air	7,566 (89.5%)	7,195 (89.5%)	285 (91.9%)
Not recorded	290 (3.4%)	269 (3.3%)	12 (3.9%)

2.2.4. Was supplementary oxygen commenced, continued or discontinued following the SpO₂ measurement (for hypoxic CYP only)?

Oxygen supplied (hypoxic CYP only)	2019/20		
	All (n=1,994)	England (n=1,919)	Wales (n=54)
Commenced	1,351 (67.8%)	1,300 (67.7%)	36 (66.7%)
Continued	65 (3.3%)	63 (3.3%)	<5
Discontinued	<5	<5	0 (0.0%)
Not commenced	574 (28.8%)	552 (28.8%)	17 (31.5%)

Those who answered 'not recorded' for question 2.2.3 have not been included in this table because it wasn't known if they were on supplementary oxygen and therefore couldn't be included in the denominator tool

2.3 Peak expiratory flow rate (PEFR)

2.3.1 Number of patients with PEFR recorded

Was PEFR recorded?	2019/20		
	All (n=4,973)	England (n=4,716)	Wales (n=180)
Recorded	969 (19.5%)	934 (19.8%)	24 (13.3%)
CYP too unwell	326 (6.6%)	320 (6.8%)	6 (3.3%)
Not recorded	3,678 (74.0%)	3,462 (73.4%)	150 (83.3%)



Section 3: Acute treatment

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Key standards:

- > **BTS/SIGN 2019 [9.8.2]:** Inhaled beta agonists are the first line of treatment for acute asthma in children.¹
- > **BTS/SIGN 2019 [9.8.4]:** Give oral steroids early in treatment of acute asthma attacks in children.¹
- > **BTS/SIGN 2019 [9.9]:** Children with continuing severe asthma despite optimal first-line treatments, frequent nebulised beta agonists and ipratropium bromide plus oral steroids and those with life-threatening features, need urgent review by a specialist with a view to management in an appropriate high-dependency area or transfer to a paediatric intensive care unit to receive second-line intravenous therapies.
Three options, IV magnesium sulphate, IV beta agonists or IV aminophylline, can be considered.¹
- > **NICE 2013 QS25 [QS8]:** People aged 5 years or older presenting to a healthcare professional with a severe or life-threatening acute exacerbation of asthma receive oral or intravenous steroids within 1 hour of presentation.²
- > **NICE 2013 QS25 [QS9]:** People admitted to hospital with an acute exacerbation of asthma have a structured review by a member of a specialist respiratory team before discharge.²

Administration of steroids:

If not already given before arrival:

- > **RCEM moderate acute and severe asthma 2016/17 [5a]:** Within 60 minutes of arrival (acute severe).³
- > **RCEM moderate and acute severe asthma 2016/17 [5b]:** Within 4 hours (moderate).³

Key findings

Review by a member of the multidisciplinary team (MDT) trained in asthma care

- > **80.8%** of CYP admitted were reviewed by a member of the MDT trained in asthma care.

Systemic steroids

- > **88.0%** of CYP received systemic corticosteroids during their admission, but these were not given early: only **38.7%** of CYP aged 6 years or older, who had not received systemic corticosteroids before arrival at hospital, **received them within 1 hour of arrival**.
- > The **median time** to administration of systemic corticosteroids was **1 hour** (IQR 1–3 hours).

Beta agonists

- > **95.2%** of CYP received beta agonist bronchodilators during their admission, with the majority receiving them within 1 hour (median time to administration 40 minutes, IQR 19–88 minutes).

Intravenous medications and need for critical care admission

- > **19.5%** of CYP presented with refractory, life-threatening acute asthma requiring intravenous medication.
- > **9.7%** of CYP required admission to critical care (high dependency and/or intensive care).

Navigation

This section contains the following tables and graphs. If you are viewing this report on a computer, you can select the table that you wish to see from the list below.

- > 3.1 MDT review
- > 3.3.1 Was the patient reviewed by a member of the MDT trained in asthma care during their admission?
- > 3.2 Systemic steroids (oral and intravenous)
 - > 3.2.1 Was the patient administered systemic steroids prior to their arrival at hospital for this asthma attack?
 - > 3.2.2 Was the patient administered systemic steroids following arrival at hospital?
 - > 3.2.3a Did the patient receive systemic steroids within 1 hour
 - > 3.2.3b Percentage of CYP who received systemic steroids within 1 hour by day and time of arrival
 - > 3.2.3c How many children aged 1–5 years old received systemic steroids within 1 hour?
 - > 3.2.3d How many CYP over 6 years old received systemic steroids within 1 hour?
 - > 3.2.4 Median time, in hours, from arrival at hospital to administration of steroids
- > 3.3 Beta agonists
 - > 3.3.1 Was the patient administered beta agonists prior to their arrival at hospital for this asthma attack?
 - > 3.3.2 Was the patient administered beta agonists following arrival at hospital?
 - > 3.3.3 Median time, in hours, from arrival at hospital to administration of beta agonists
 - > 3.3.4 Time to administration of beta agonists
- > 3.4 Intravenous medications (treatment of life-threatening refractory asthma)
 - > 3.4.1 Did the patient receive any intravenous medications during their hospital admission?
 - > 3.4.2 Was the patient transferred to critical care at any point during their admission?
- > 3.5 Inpatient mortality

3.1 MDT review

3.1.1 Was the patient reviewed by a member of the MDT trained in asthma care during their admission?

MDT review	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Yes	6,869 (80.8%)	6,603 (81.6%)	175 (56.3%)

MDT = multidisciplinary team

3.2 Systemic steroids (oral or intravenous)

3.2.1 Was the patient administered systemic steroids prior to their arrival at hospital for this asthma attack?

Systemic steroids prior to arrival	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Yes	1,646 (19.4%)	1,535 (19.0%)	69 (22.2%)
Not recorded	742 (8.7%)	727 (9.0%)	9 (2.9%)
Not administered	6,118 (71.9%)	5,828 (72.0%)	233 (74.9%)

3.2.2 Was the patient administered systemic steroids following arrival at hospital?

Systemic steroids on arrival	2019/20		
	All (n=6,860)	England (n=6,555)	Wales (n=242)
Yes	6,038 (88.0%)	5,784 (88.2%)	201 (83.1%)
Not administered	607 (8.8%)	562 (8.6%)	38 (15.7%)
Not recorded	215 (3.1%)	209 (3.2%)	<5

Denominator: all patients **not** administered systemic steroids **prior** to arrival

3.2.3a Did the patient receive systemic steroids within 1 hour?

Systemic steroids within 1 hour	2019/20		
	All (n=6,860)	England (n=6,555)	Wales (n=242)
Less than 1 hour	2,484 (36.2%)	2,368 (36.1%)	90 (37.2%)
1 hour or over	3,554 (51.8%)	3,416 (52.1%)	111 (45.9%)
Not administered	607 (8.8%)	562 (8.6%)	38 (15.7%)
Not recorded	215 (3.1%)	209 (3.2%)	<5

Those who weren't given steroids / not recorded as having steroids included in the denominator of this variable to keep in line with question below. Only exclusion is 'steroids given before arrival'

3.2.3b Percentage of CYP who received systemic steroids within 1 hour by day and time of arrival

Time of arrival	Day of arrival						
	Monday (n=1,234)	Tuesday (n=1,055)	Wednesday (n=937)	Thursday (n=853)	Friday (n=835)	Saturday (n=850)	Sunday (n=1,096)
00.00–03.59	50 (38.2%)	44 (41.1%)	34 (36.2%)	35 (40.7%)	29 (35.8%)	34 (40.5%)	41 (40.6%)
04.00–07.59	52 (44.8%)	41 (38.0%)	24 (34.8%)	34 (47.2%)	27 (32.9%)	41 (50.0%)	37 (35.9%)
08.00–11.59	86 (35.2%)	83 (40.5%)	65 (36.7%)	62 (38.5%)	70 (45.8%)	48 (35.6%)	83 (45.1%)
12.00–15.59	78 (31.6%)	73 (34.1%)	59 (29.9%)	49 (29.0%)	61 (37.4%)	69 (39.4%)	89 (36.5%)
16.00–19.59	103 (34.2%)	69 (28.6%)	65 (29.5%)	73 (34.1%)	76 (37.3%)	69 (37.7%)	88 (38.9%)
20.00–23.59	73 (37.4%)	60 (33.3%)	67 (37.2%)	43 (28.5%)	60 (39.5%)	64 (33.5%)	76 (31.9%)

Denominator: those who weren't given systemic steroids prior to arrival, and who were either not given systemic steroids (No / not recorded) or had a time for when they were given systemic steroids

Key

Lowest (28.5%)

Highest (50.0%)

3.2.3c How many children aged 1–5 years old received systemic steroids within 1 hour?

Steroids 1 hour 1–5 years old	2019/20		
	All (n=3,024)	England (n=2,897)	Wales (n=109)
Less than 1 hour	1,000 (33.1%)	952 (32.9%)	39 (35.8%)
1 hour or over	1,619 (53.5%)	1,563 (54.0%)	48 (44.0%)
Not administered	311 (10.3%)	290 (10.0%)	21 (19.3%)
Not recorded	94 (3.1%)	92 (3.2%)	<5

3.2.3d How many CYP over 6 years old received systemic steroids within 1 hour?

Steroids 1 hour over 6 years old	2019/20		
	All (n=3,836)	England (n=3,658)	Wales (n=133)
Less than 1 hour	1,484 (38.7%)	1,416 (38.7%)	51 (38.3)
1 hour or over	1,935 (50.4%)	1,853 (50.7%)	63 (47.4%)
Not administered	296 (7.7%)	272 (7.4%)	17 (12.8%)
Not recorded	121 (3.2%)	117 (3.2%)	<5



National QI priority C2: Administer systemic steroids within 1 hour of arrival at hospital to **95%** of children and young people aged 6 years old or over, who have not received systemic steroids as part of pre-hospital care.

Rationale:

Early administration of systemic steroids prevents hospital admission.

BTS/SIGN 2016 [9.8.4] NICE 2013 QS25 [QS8];, RCEM asthma guidance [standards 5a and 5b]

Tips to achieve this priority:

- > Staff should undertake reviews of cases where steroids were not given within 1 hour, to better understand the barriers to effective care and then to implement an improvement change.
- > Provide education and training to staff on when to administer oral steroids, and the evidence behind early administration.
- > Build prompts into electronic and other systems to encourage delivery of oral steroids at triage.

3.2.4 Median time, in hours, from arrival at hospital to administration of systemic steroids

Median time, in hours, from arrival to administration of systemic steroids	2019/20		
	All (n=6,038)	England (n=5,784)	Wales (n=201)
Median (IQR)	1 (1 to 3)	1 (1 to 3)	1 (0 to 2)

Denominator: all patients not administered systemic steroids prior to arrival and administered systemic steroids in hospital

3.3 Beta agonists

3.3.1 Was the patient administered beta agonists prior to their arrival at hospital for this asthma attack?

Beta agonists prior to arrival	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Yes	7,174 (84.3%)	6,817 (84.3%)	260 (83.6%)
Not recorded	425 (5.0%)	404 (5.0%)	17 (5.5%)
Not administered	907 (10.7%)	869 (10.7%)	34 (10.9%)

3.3.2 Was the patient administered beta agonists following arrival at hospital?

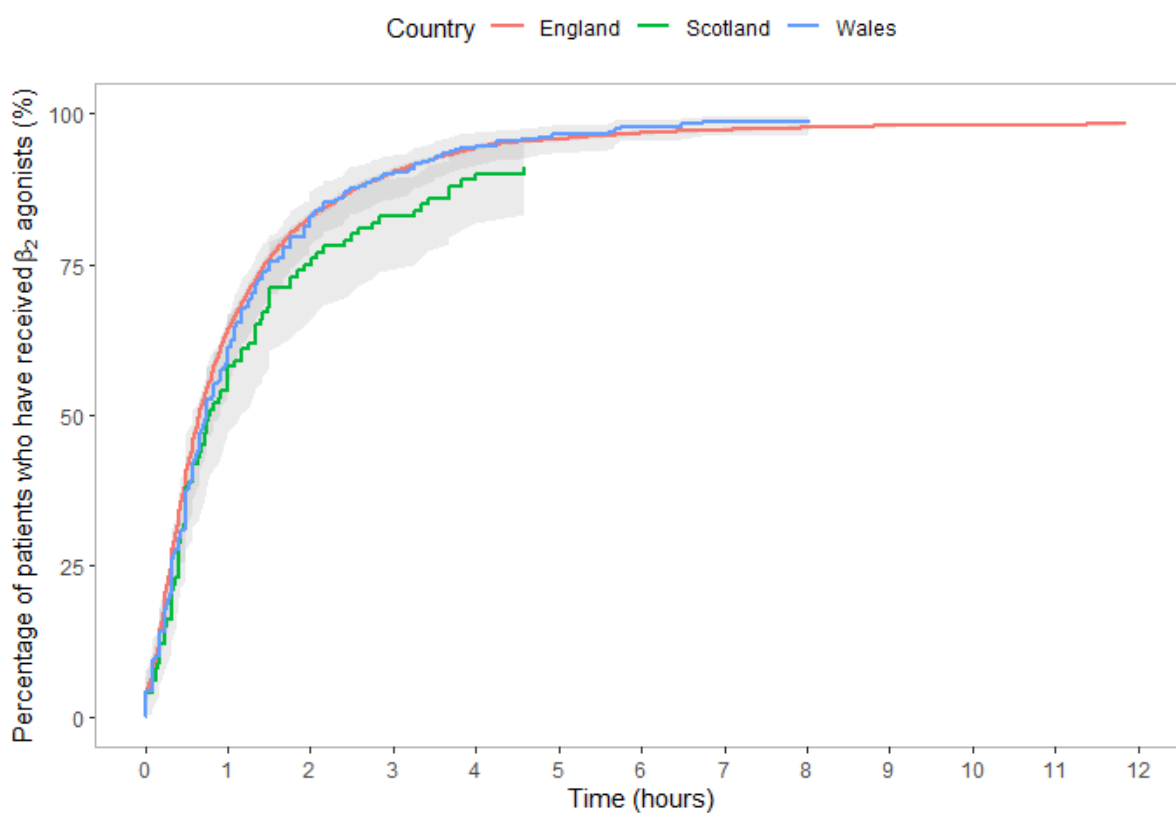
Beta agonists in hospital	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Yes	8,100 (95.2%)	7,715 (95.4%)	285 (91.6%)
Not administered	184 (2.2%)	172 (2.1%)	7 (2.3%)
Not recorded	222 (2.6%)	203 (2.5%)	19 (6.1%)

3.3.3 Median time, in minutes, from arrival at hospital to administration of beta agonists

Median time, in minutes, from arrival to administration of beta agonists	2019/20		
	All (n=8,100)	England (n=7,715)	Wales (n=285)
Median (IQR)	40 (19 to 88)	40 (19 to 87)	45 (20 to 90)

3.3.4 Time to administration of beta agonists

Cumulative percentage of CYP who received beta agonists following arrival at hospital



3.4 Intravenous medications (treatment of life-threatening refractory asthma)

3.4.1 Did the patient receive any intravenous medications during their hospital admission?

Intravenous medications*	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
No	6,850 (80.5%)	6,480 (80.1%)	276 (88.7%)
Magnesium sulphate	1,387 (16.3%)	1,367 (16.9%)	16 (5.1%)
Aminophylline	605 (7.1%)	584 (7.2%)	15 (4.8%)
Beta agonists	449 (5.3%)	418 (5.2%)	27 (8.7%)
Ketamine	15 (0.2%)	14 (0.2%)	<5

*One or more medications or 'no' only could be selected

3.4.2 Was the patient transferred to critical care at any point during their admission?

Critical care	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
ICU* only	58 (0.7%)	55 (0.7%)	<5
HDU** only	762 (9.0%)	725 (9.0%)	23 (7.4%)
ICU and HDU	4 ^{††} (0.0%)	<5	0 (0.0%)
No	7,682 (90.3%)	7,306 (90.3%)	286 (92.0%)

*Intensive care unit

**High-dependency unit

3.5 Inpatient mortality

Inpatient mortality	2019/20		
	All (n=8,506)	England (n=8,090)	Wales (n=311)
Inpatient deaths	0 (0.0%)	0 (0.0%)	0 (0.0%)

^{††} NACAP's policy is to suppress small numbers less than 5 (1–4). However, the above information regarding critical care and referrals to HDU and ICUs has been deemed a key finding of the report. For this reason, this information has not been suppressed in the 'All' figure. We do not feel there is a risk of identifying individual patients as a consequence of this due to the fact that it remains suppressed at country level and Scottish-specific data has not been presented.



Section 4: Discharge planning

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Key standards:

A discharge bundle is a structured way of improving discharge processes and care which leads to improved patient outcomes. [BTS care bundle for asthma](#)¹

- > [BTS/SIGN 2019 \[2.4\]](#): People with asthma and parents of children with asthma should be advised about the dangers of smoking and second-hand tobacco smoke exposure and be offered appropriate support to stop smoking.¹
- > [BTS/SIGN 2019 \[2.5\]](#): Inhaled corticosteroids are the recommended preventer drug for adults and children for achieving overall treatment goals.¹
- > [BTS/SIGN 2019 \[2.6\]](#): Prescribe inhalers only after patients have received training in the use of the device and have demonstrated satisfactory technique.¹
- > [BTS/SIGN 2019 \[9.6.3\]](#): It is essential that the patient's primary care practice is informed within 24 hours of discharge from emergency department or hospital following an asthma attack. Ideally this communication should be directly with a named individual responsible for asthma care within the practice.¹
- > [NICE 2013, updated 2018 QS25 \[QS2\]](#): People aged 5 years and over with asthma discuss and agree a written personalised action plan.²
- > [NICE 2013, updated 2018 QS25 \[QS4\]](#): People who receive treatment in an emergency care setting for an asthma attack are followed up by their general practice within 2 working days of discharge.²
- > [NRAD 2014 why asthma still kills: medical and professional care \[Recommendation 1\]](#): All people with asthma should be provided with written guidance in the form of a personal asthma action plan (PAAP) that details their own triggers and current treatment, and specifies how to prevent relapse and when and how to seek help in an emergency.⁵
- > [NRAD 2014 why asthma still kills: medical and professional care \[Recommendation 3\]](#): Factors that trigger or exacerbate asthma must be elicited routinely and documented in the medical records and personal asthma action plans (PAAPs) of all people with asthma, so that measures can be taken to reduce their impact.⁵
- > [NRAD 2014 why asthma still kills: patient factors and perception of risk \[Recommendation 2\]](#): A history of smoking and/or exposure to second-hand smoke should be documented in the medical records of all people with asthma. Current smokers should be offered referral to a smoking-cessation service.⁵
- > [NRAD 2014 why asthma still kills: prescribing and medicines use \[Recommendation 3\]](#): Non-adherence to preventer inhaled corticosteroids is associated with increased risk of poor asthma control and should be continually monitored.⁵

Key findings

Discharge bundle

- > **52.2%** of CYP received some form of asthma care bundle before discharge, but the components are likely to vary between hospitals.
- > **89.6%** received at least one element of good practice care, but the proportions receiving each individual element of good practice were low.

Education to empower better self-care by CYP and families

- > **61.9%** had inhaler technique checked.
- > **45.5%** had a PAAP given or reviewed.

Reducing the risk of future asthma attacks

- > **70.9%** of children were discharged with inhaled corticosteroids.
- > **68.6%** had a review of their maintenance medication.
- > **41.4%** had a discussion about triggers.
- > **78.1%** of CYP who were smokers had tobacco dependency addressed.
- > **36.6%** of parents/carers who smoked had this addressed.

Follow-up

- > **41.5%** had a community follow-up requested to take place within 48 hours of discharge.
- > **57.7%** were either already in a secondary care clinic or were referred to one.^{##}
- > **28.0%** had secondary care follow-up requested to take place within 4 weeks.

Review before discharge by a member of a paediatric asthma MDT was associated with a higher likelihood of good practice care with CYP being:

- > Nearly three times more likely to receive a discharge bundle than those who did not receive an MDT review (adjusted odds ratio [OR] = 2.83, 95% confidence interval [CI] 2.33 to 3.42).
- > Nearly three times more likely to have their inhaler technique checked than those who did not receive an MDT review (adj-OR = 2.97, 95% CI 2.46 to 3.58).
- > Nearly two and a half times more likely to receive a PAAP than those who did not receive an MDT review (adj-OR = 2.42, 95% CI 1.98 to 2.95).

^{##} This is the sum of the first two responses in the 'All' column for question 4.3.3 – was the patient referred for hospital assessment or follow-up for asthma?

Navigation

This section contains the following tables and graphs. If you are viewing this report on a computer, you can select the table that you wish to see from the list below.

- > 4.1 Day of discharge
 - > 4.1.1 Length of stay
- > 4.2 Discharge bundles
 - > 4.2.1a Was a discharge bundle implemented for this admission?
 - > 4.2.1b Number of CYP receiving discharge bundle by day of the week
 - > 4.2.2 What elements of good practice care were undertaken as part of the patient's discharge?
- > 4.3 Steroids at discharge
 - > 4.3.1 Was the patient in receipt of inhaled steroids at discharge?
 - > 4.3.2 Was the patient prescribed oral steroids at discharge?
 - > 4.3.3 Was the patient referred for hospital assessment / follow-up of asthma?

4.1 Day of discharge

Day of discharge	2019/20		
	All (n=8,470)	England (n=8,056)	Wales (n=311)
Monday	1,369 (16.2%)	1,315 (16.3%)	43 (13.8%)
Tuesday	1,303 (15.4%)	1,239 (15.4%)	50 (16.1%)
Wednesday	1,315 (15.5%)	1,243 (15.4%)	54 (17.4%)
Thursday	1,254 (14.8%)	1,191 (14.8%)	47 (15.1%)
Friday	1,144 (13.5%)	1,086 (13.5%)	44 (14.1%)
Saturday	1,050 (12.4%)	1,008 (12.5%)	26 (8.4%)
Sunday	1,035 (12.2%)	974 (12.1%)	47 (15.1%)

Note: 36 (0.4%) CYP who were transferred to another hospital were not included. Patients who died were also excluded

4.1.1 Length of stay

Length of stay, hours	2019/20		
	All (n=8,470)	England (n=8,056)	Wales (n=311)
Median (IQR)	25 (13 to 46)	25 (13 to 46)	18 (7 to 30)

Note: 36 (0.4%) CYP who were transferred to another hospital were not included. Patients who died were also excluded

4.2 Discharge bundles

4.2.1a Was a discharge bundle implemented for this admission?

Discharge bundle completed for this admission	2019/20		
	All (n=8,470)	England (n=8,056)	Wales (n=311)
Yes	4,423 (52.2%)	4,188 (52.0%)	163 (52.4%)
No	3,957 (46.7%)	3,778 (46.9%)	148 (47.6%)
Patient self-discharged	90 (1.1%)	90 (1.1%)	0 (0.0%)

Note: 36 (0.4%) CYP who were transferred to another hospital were not included. Patients who died were also excluded

4.2.1b Number of CYP receiving discharge bundle by day of the week

No. of patients receiving discharge bundle by day of the week	2019/20		
	Yes (n=4,423)	No (n=3,957)	Parental / carer / self-discharge (n=90)
Monday	726 (53.0%)	629 (45.9%)	14 (1.0%)
Tuesday	701 (53.8%)	587 (45.0%)	15 (1.2%)
Wednesday	721 (54.8%)	582 (44.3%)	12 (0.9%)
Thursday	628 (50.1%)	612 (48.8%)	14 (1.1%)
Friday	588 (51.4%)	543 (47.5%)	13 (1.1%)
Saturday	543 (51.7%)	495 (47.1%)	12 (1.1%)
Sunday	516 (49.9%)	509 (49.2%)	10 (1.0%)

Note: 36 (0.4%) CYP who were transferred to another hospital were not included. Patients who died were also excluded




4.2.2 What elements of good practice care were undertaken as part of the patient's discharge?

Elements of good practice care	2019/20		
	All (n=8,470)	England (n=8,056)	Wales (n=311)
Inhaler technique checked	5,246 (61.9%)	4,999 (62.1%)	185 (59.5%)
Maintenance medication reviewed	5,811 (68.6%)	5,555 (69.0%)	187 (60.1%)
Adherence discussed	3,784 (44.7%)	3,583 (44.5%)	150 (48.2%)
Personalised asthma action plan issued/reviewed	3,852 (45.5%)	3,641 (45.2%)	138 (44.4%)
Triggers discussed	3,508 (41.4%)	3,329 (41.3%)	139 (44.7%)
Tobacco dependency addressed with patient*	57 (78.1%)	54 (77.1%)	<5
Tobacco dependency addresses with parent**	547 (36.6%)	520 (36.6%)	25 (42.4%)
Community follow-up requested within 2 working days	3,511 (41.5%)	3,402 (42.2%)	92 (29.6%)
Paediatric asthma clinic requested within 4 weeks	2,372 (28.0%)	2,216 (27.5%)	125 (40.2%)
None	878 (10.4%)	790 (9.8%)	83 (26.7%)

* Smoking status is only recorded for patients over the age of 11 upon arrival at hospital. Denominator for this element is based on the number of current smokers. Vapers not included identified in Table 1.5.1


** Denominator for this element is based on the number of patients exposed to second-hand smoke identified in table 1.5.2 Denominator: all living discharged patients including those that self-discharged. Patients who were transferred have not been included



C3

National QI priority C3: Provide **95%** of children and young people with the following as part of their discharge bundle:

- 1 Review or issue of a personalised asthma action plan (PAAP).
- 2 Check of their inhaler technique.
- 3 A follow-up appointment in a paediatric asthma clinic requested within 4 weeks.



Rationale

As highlighted in the [National Review of Asthma Deaths](#) report, one key factor in CYP who died from asthma was a lack of understanding of the basic elements of self-management and this is the same for many CYP admitted to hospital with severe life-threatening asthma. Given that the most consistent risk factor for having an asthma attack is a recent history of an acute exacerbation, it is important to focus on these elements of education using a PAAP before discharge.

Tips to achieve this priority

- > Survey staff to understand the challenges to administering this education to CYP in the emergency department and on the wards.
- > Develop tailored support and systems to overcome identified challenges.
- > Develop standardised written information.
- > Provide education and training to staff on inhaler technique and personalised asthma action plans.
- > Encourage these actions by mandating they be recorded in electronic systems.

4.3 Steroids at discharge

4.3.1 Was the patient in receipt of inhaled steroids at discharge?

Inhaled steroids at discharge	2019/20		
	All (n=8,470)	England (n=8,056)	Wales (n=311)
Yes	6,009 (70.9%)	5,712 (70.9%)	218 (70.1%)
No – not medically indicated	1,165 (13.8%)	1,099 (13.6%)	49 (15.8%)
No – reason not given	1,284 (15.2%)	1,233 (15.3%)	44 (14.1%)
Offered but patient/parent/carer declined	12 (0.1%)	12 (0.1%)	0 (0.0%)

Denominator: all living discharged patients including self-discharged, but excluding those who transferred

4.3.2 Was the patient prescribed oral steroids at discharge?

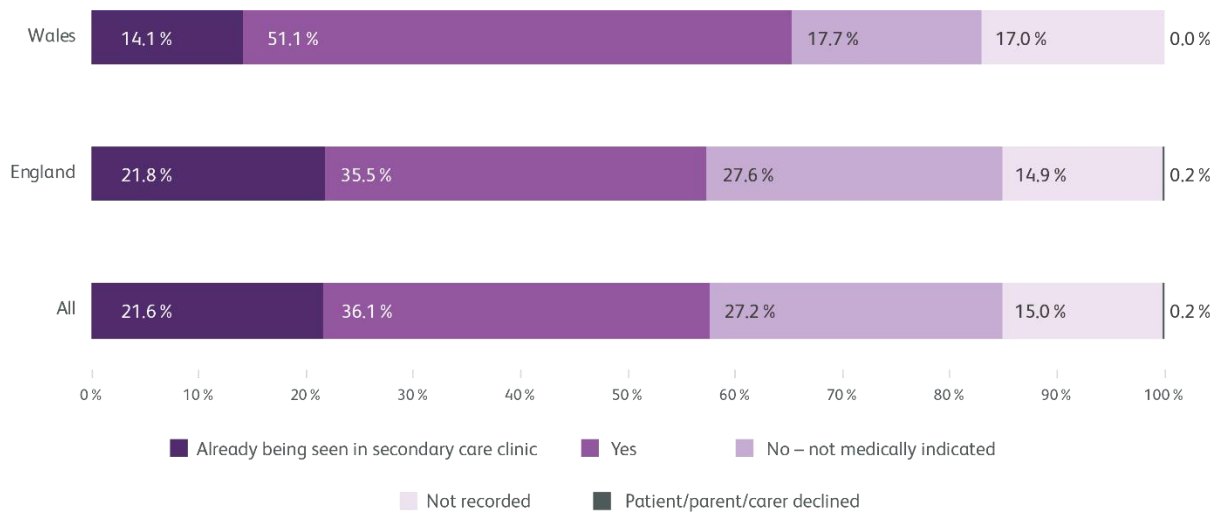
Oral steroids at discharge	2019/20		
	All (n=8,470)	England (n=8,056)	Wales (n=311)
Yes	5,822 (68.7%)	5,503 (68.3%)	243 (78.1%)
No – not medically indicated	1,768 (20.9%)	1,710 (21.2%)	38 (12.2%)
No – reason not given	880 (10.4%)	843 (10.5%)	30 (9.6%)

4.3.3 Was the patient referred for hospital assessment / follow-up for asthma?

Referral for hospital assessment / follow-up	2019/20		
	All (n=8,470)	England (n=8,056)	Wales (n=311)
Already being seen in secondary care clinic	1,830 (21.6%)	1,756 (21.8%)	44 (14.1%)
Yes	3,054 (36.1%)	2,862 (35.5%)	159 (51.1%)
No – not medically indicated	2,301 (27.2%)	2,222 (27.6%)	55 (17.7%)
Not recorded	1,272 (15.0%)	1,203 (14.9%)	53 (17.0%)
Patient/parent/carer declined	13 (0.2%)	13 (0.2%)	0 (0.0%)

Denominator: all living and discharged patients including self-discharged, but excluding those who transferred

Fig 4. Percentage of CYP referred for hospital assessment / follow-up for asthma





Section 5: Sub-analyses^{§§}

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This section contains sub-analyses of the 2019/20 data presented in the previous sections, and presents associations between various metrics and:

- > Administration of systemic steroids within 1 hour of arrival at hospital.
- > Whether a multidisciplinary team (MDT) review had taken place
- > Whether peak expiratory flow rate (PEFR) has been recorded.

Navigation

This section contains the following tables and graphs. If you are viewing this report on a computer, you can select the table that you wish to see from the list below.

- > [5.1 MDT review and association with receiving a discharge bundle](#)
- > [5.2 MDT review and association with those having their inhaler technique checked](#)
- > [5.3 MDT review and association with those having their personalised asthma action plan issued or reviewed](#)

5.1 MDT review and association with receiving a discharge bundle

	2019/20	
	MDT review (n=6,837)	No MDT review (n=1,633)
Received a discharge bundle	3,720 (54.4%)	703 (43.0%)

After adjusting for clustering by hospital, CYP who received an MDT review were nearly three times more likely to receive a discharge bundle than CYP who did not receive an MDT review (adj-OR = 2.83, 95%CI 2.33 to 3.42). It is important to account for clustering by hospital because better performing hospitals may be more likely to both perform MDT reviews and administer discharge bundles, which may confound the association between MDT review and receipt of a discharge bundle.

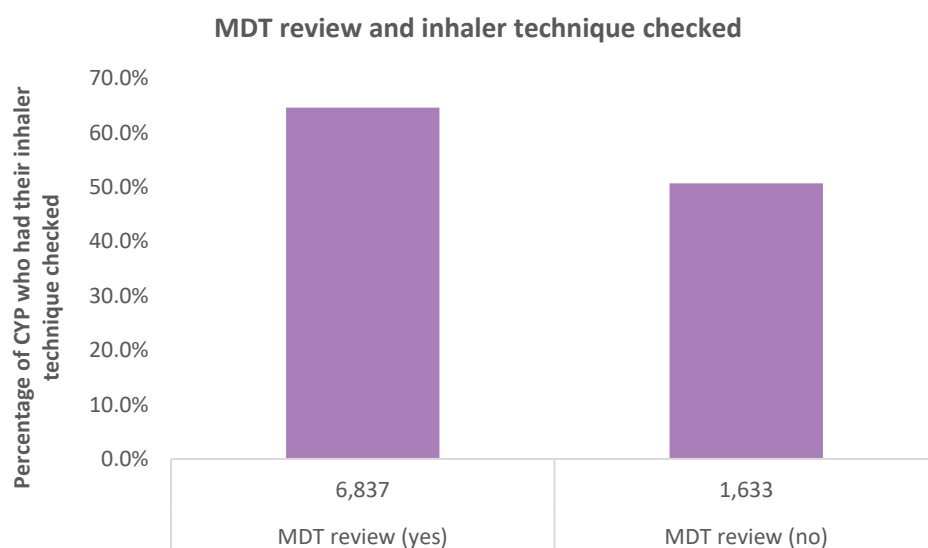
5.2 MDT review and association with those having their inhaler technique checked

	2019/20	
	MDT review (n=6,837)	No MDT review (n=1,633)
Inhaler technique checked	4,418 (64.6%)	828 (50.7%)

After adjusting for clustering by hospital, CYP who received an MDT review were nearly three times more likely to have their inhaler technique checked than CYP who did not receive an MDT review (adj-OR = 2.97, 95% CI 2.46 to 3.58).

^{§§} Due to all outcomes other than mortality being quite common, odds ratios will not approximate risk ratios

Fig 5. MDT review and association with inhaler technique checked

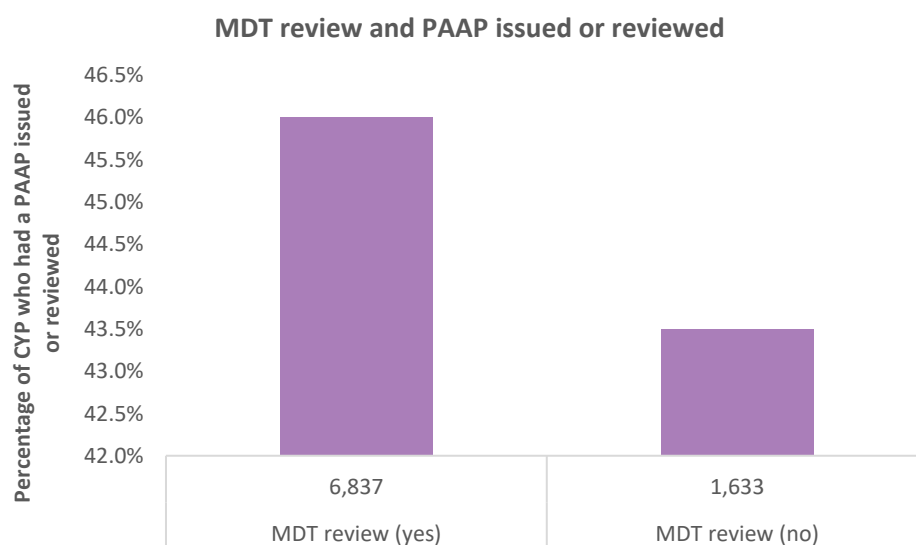


5.3 MDT review and association with those having their personalised asthma action plan (PAAP) issued or reviewed

	2019/20	
	MDT review (n=6,837)	No MDT review (n=1,633)
PAAP issued or reviewed	3,142 (46.0%)	710 (43.5%)

After adjusting for clustering by hospital, CYP who received an MDT review were nearly two and a half times as likely to receive a personalised asthma action plan than CYP who did not receive an MDT review (adj-OR = 2.42, 95%CI 1.98 to 2.95).

Fig 6. MDT review and association with PAAP issued or reviewed





Section 6: Benchmarked key indicators

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To see aggregated, hospital-level data in full for patients admitted to hospital on or after 1 June 2019 and discharged by 31 January 2020, please access the children and young people asthma secondary care clinical audit 2019–2020 data file available at: www.rcplondon.ac.uk/nacap-cyp-asthma-2019/20.

Table 1 shows the national medians, lower quartiles and upper quartiles for the key indicators that have been presented in the unadjusted benchmarking of hospitals (section 6.1). The values presented in section 6.1 have been derived by the method shown visually in the box and whisker plot (Fig 1). More specifically, to create the 'box', data for each key indicator were ordered numerically from smallest (whisker; P0) to largest (whisker; P100) to find the median (P50), the middle point of the values. The data are divided into two halves, which are then divided in half again to identify the lower quartile (P25) and the upper quartile (P75).

Table 1. Medians, lower quartiles and upper quartiles for key indicators

	Key indicators				
Median and interquartile ranges (%)	Steroids within 1 hour (%)	Patient tobacco dependency addressed (%)	Parent/carer tobacco dependency addressed (%)	Inhaler technique checked (%)	Personalised asthma action plan (PAAP) reviewed (%)
Lower quartile	25%	50%	10%	38%	12%
Median	35%	100%	33%	63%	38%
Upper quartile	45%	100%	54%	79%	69%

Table 2. Rationale for each indicator

Benchmarking dashboard performance indicator	Rationale
Process items	
Was the patient administered steroids within 1 hour following arrival?	<ul style="list-style-type: none"> > Early administration of systemic steroids prevents hospital admission. > Maps to NICE 2013 QS25 [QS8]
Which of the following elements of good practice care were undertaken as part of the discharge process?	
- Patient tobacco dependency addressed	<ul style="list-style-type: none"> > Smoking and exposure to second-hand smoke are important risk factors for acute asthma attacks and also for accelerated lung function decline and development of COPD in later life. Nicotine is one of the most addictive substances in the world and specialist services are shown to improve rates of smoking cessation. Smoking cessation approaches for children and young people will differ from those in adults. > Maps to BTS/SIGN 2019 [2.4]
- Parent/carer tobacco dependency addressed	<ul style="list-style-type: none"> > Smoking and exposure to second-hand smoke are important risk factors for acute asthma attacks and also for accelerated lung function decline and development of COPD in later life. Nicotine is one of the most addictive substances in the world and specialist services are shown to improve rates of smoking cessation. Smoking cessation approaches for children and young people will differ from those in adults. > Maps to BTS/SIGN 2019 [2.4]
- Inhaler technique checked	<ul style="list-style-type: none"> > As highlighted in the NRAD report, one of the key factors in children and young people who died from asthma was lack of understanding of basic elements of self-management, and this is the same for many children and young people admitted to hospital with severe or life-threatening asthma. Given that the most consistent risk factor for having an asthma attack is recent history of acute exacerbation, it is important to focus on these elements.
- Personalised asthma action plan (PAAP) issued or reviewed	<ul style="list-style-type: none"> > As highlighted in the NRAD report, one of the key factors in children and young people who died from asthma was lack of understanding of basic elements of self-management, and this is the same for many children and young people admitted to hospital with severe or life-threatening asthma. Given that the most consistent risk factor for having an asthma attack is recent history of acute exacerbation, it is important to focus on these elements.

Key

The colours refer to the quartile in which each result lies:

Red = Result equal to or below lower quartile for that indicator

Amber = Result above lower quartile but below upper quartile for that indicator

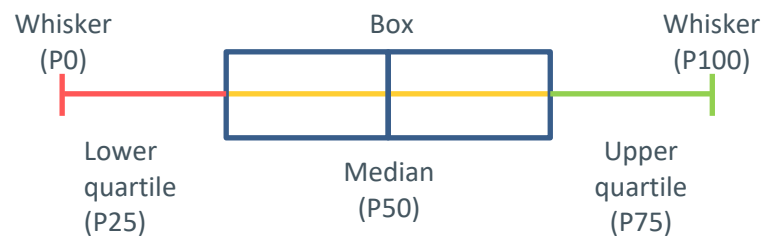
Green = Result equal to or above upper quartile for that indicator

Grey = Not applicable

Where numerator has been suppressed and the percentage result is neither 0% or 100%, a – (dash) has been put in place of a number.

NA = where a particular indicator does not apply to a hospital because no patients were measured against this indicator.

Fig 1. Box and whisker plot



6.1 Unadjusted benchmarking

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked		Personalised asthma action plan	
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
England												
Airedale NHS Foundation Trust	Airedale General Hospital	16	9	75%	NA	NA	0	0%	<5	–	6	38%
Alder Hey Children's NHS Foundation Trust	Alder Hey Children's Hospital	101	26	29%	<5	100%	<5	–	29	29%	21	21%
Ashford and St Peter's Hospitals NHS Foundation Trust	St Peter's Hospital	70	19	32%	0	0%	<5	–	24	34%	5	7%
Barking, Havering and Redbridge University Hospitals NHS Trust	King George Hospital	93	35	47%	NA	NA	6	100%	83	89%	74	80%
Barking, Havering and Redbridge University Hospitals NHS Trust	Queen's Hospital Romford	136	56	59%	NA	NA	11	100%	89	65%	81	60%
Barnsley Hospital NHS Foundation Trust	Barnsley District General Hospital	55	19	38%	<5	100%	7	29%	42	76%	22	40%
Barts Health NHS Trust	Newham General Hospital	51	18	41%	NA	NA	<5	–	31	61%	11	22%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Barts Health NHS Trust	Whipps Cross Hospital	48	28	67%	NA	NA	<5	100%	17	35%	9	19%
Basildon and Thurrock University Hospitals NHS Foundation Trust	Basildon Hospital	28	12	44%	NA	NA	5	71%	24	86%	0	0%
Bedford Hospital NHS Trust	Bedford Hospital	15	<5	–	NA	NA	<5	–	11	73%	<5	–
Birmingham Women's and Children's NHS Foundation Trust	Birmingham Children's Hospital	333	86	30%	NA	NA	38	53%	260	78%	246	74%
Bolton NHS Foundation Trust	Royal Bolton Hospital	107	40	42%	NA	NA	<5	–	35	33%	62	58%
Bradford Teaching Hospitals NHS Foundation Trust	Bradford Royal Infirmary	48	9	23%	NA	NA	NA	NA	0	0%	0	0%
Brighton and Sussex University Hospitals NHS Trust	Royal Alexandra Children's Hospital	23	6	35%	NA	NA	<5	–	13	57%	<5	–
Buckinghamshire Healthcare NHS Trust	Stoke Mandeville Hospital	46	6	16%	NA	NA	<5	100%	24	53%	23	51%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%	95%		
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Calderdale and Huddersfield NHS Foundation Trust	Calderdale Royal Hospital	121	30	31%	0	0%	0	0%	109	90%	<5	–
Cambridge University Hospitals NHS Foundation Trust	Addenbrooke's Hospital	47	10	25%	NA	NA	<5	–	25	53%	26	55%
Chelsea and Westminster Hospital NHS Foundation Trust	Chelsea and Westminster Hospital	48	16	41%	NA	NA	0	0%	31	65%	<5	–
Chelsea and Westminster Hospital NHS Foundation Trust	West Middlesex University Hospital	80	22	32%	NA	NA	<5	–	18	22%	<5	–
Chesterfield Royal Hospital NHS Foundation Trust	Chesterfield Royal	28	9	36%	<5	100%	<5	–	26	93%	15	54%
Countess of Chester Hospital NHS Foundation Trust	Countess of Chester Hospital	50	20	47%	NA	NA	7	47%	47	94%	16	32%
County Durham and Darlington NHS Foundation Trust	Darlington Memorial Hospital	49	11	35%	0	0%	0	0%	35	71%	12	24%
County Durham and Darlington NHS Foundation Trust	University Hospital of North Durham	77	19	29%	0	0%	<5	–	40	52%	23	30%

Trust name	Hospital name	Cases audited	Steroids* within 1 hour		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
National QI aim		–	95%		95%		95%		95%	95%		
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Croydon Health Services NHS Trust	Croydon University Hospital	36	17	53%	<5	100%	<5	–	14	39%	<5	–
Dartford and Gravesham NHS Trust	Darent Valley Hospital	54	12	29%	NA	NA	NA	NA	13	24%	0	0%
Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust	Bassetlaw District General Hospital	33	7	25%	NA	NA	<5	–	21	64%	17	52%
Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust	Doncaster Royal Infirmary	155	42	34%	<5	100%	34	71%	108	71%	100	65%
Dorset County Hospital NHS Foundation Trust	Dorset County Hospital	7	<5	–	<5	100%	0	0%	<5	–	<5	–
East Kent Hospitals University NHS Foundation Trust	Queen Elizabeth the Queen Mother Hospital	73	30	50%	NA	NA	<5	–	65	90%	24	33%
East Kent Hospitals University NHS Foundation Trust	William Harvey Hospital	59	30	68%	NA	NA	<5	–	43	74%	12	21%
East Lancashire Hospitals NHS Trust	Royal Blackburn Hospital	201	62	37%	NA	NA	30	75%	141	70%	165	82%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked		Personalised asthma action plan	
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
East Suffolk and North Essex NHS Foundation Trust	The Ipswich Hospital	10	5	56%	NA	NA	<5	100%	10	100%	5	50%
East Sussex Healthcare NHS Trust	Conquest Hospital	31	16	55%	NA	NA	0	0%	26	87%	0	0%
East Sussex Healthcare NHS Trust	Eastbourne District General Hospital	11	<5	–	NA	NA	0	0%	6	55%	0	0%
Epsom and St Helier University Hospitals NHS Trust	Epsom Hospital	11	6	60%	NA	NA	NA	NA	11	100%	7	64%
Epsom and St Helier University Hospitals NHS Trust	St Helier Hospital	13	<5	–	NA	NA	<5	100%	9	69%	5	38%
Frimley Health NHS Foundation Trust	Frimley Park Hospital	66	21	36%	NA	NA	<5	–	5	8%	31	47%
Frimley Health NHS Foundation Trust	Wexham Park Hospital	61	9	19%	NA	NA	5	62%	33	54%	26	43%
George Eliot Hospital NHS Trust	George Eliot Hospital	9	<5	–	NA	NA	0	0%	<5	50%	<5	–

Trust name	Hospital name	Cases audited	Steroids* within 1 hour		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
National QI aim		–	95%		95%		95%		95%	95%		
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Great Western Hospitals NHS Foundation Trust	The Great Western Hospital	65	26	45%	<5	100%	<5	–	52	81%	58	91%
Guy's and St Thomas' NHS Foundation Trust	St Thomas' Hospital	68	23	40%	NA	NA	<5	–	46	70%	37	56%
Hampshire Hospitals NHS Foundation Trust	Basingstoke and North Hampshire Hospital	107	30	30%	<5	100%	<5	–	84	79%	106	99%
Hampshire Hospitals NHS Foundation Trust	Royal Hampshire County Hospital	30	11	52%	NA	NA	0	0%	11	37%	22	73%
Harrogate and District NHS Foundation Trust	Harrogate District Hospital	33	<5	–	NA	NA	<5	–	30	91%	33	100%
Homerton University Hospital NHS Foundation Trust	Homerton Hospital	43	19	49%	NA	NA	<5	–	36	84%	42	98%
Hull University Teaching Hospitals NHS Trust	Hull Royal Infirmary	30	10	36%	NA	NA	5	45%	18	60%	25	83%
Imperial College Healthcare NHS Trust	St Mary's Hospital, Paddington	102	35	44%	NA	NA	<5	–	65	64%	48	47%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked		Personalised asthma action plan	
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Isle of Wight NHS Trust	St Mary's Hospital, Newport	14	<5	–	NA	NA	NA	NA	12	86%	0	0%
James Paget University Hospitals NHS Foundation Trust	James Paget Hospital	71	24	42%	<5	100%	<5	–	37	52%	17	24%
Kettering General Hospital NHS Foundation Trust	Kettering General Hospital	43	9	33%	NA	NA	<5	–	26	60%	11	26%
King's College Hospital NHS Foundation Trust	King's College Hospital	45	25	58%	<5	100%	<5	–	19	42%	8	18%
King's College Hospital NHS Foundation Trust	Princess Royal University Hospital (Bromley)	25	10	43%	NA	NA	<5	–	13	52%	5	20%
Kingston Hospital NHS Foundation Trust	Kingston Hospital	79	30	42%	NA	NA	6	43%	50	63%	36	46%
Lancashire Teaching Hospitals NHS Foundation Trust	Royal Preston Hospital	97	31	39%	<5	100%	<5	–	70	72%	29	30%
Leeds Teaching Hospitals NHS Trust	Leeds General Infirmary	44	10	29%	<5	100%	12	80%	44	100%	42	95%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Lewisham and Greenwich NHS Trust	Queen Elizabeth Hospital, Woolwich	19	11	69%	NA	NA	<5	–	7	37%	0	0%
Lewisham and Greenwich NHS Trust	University Hospital Lewisham	5	<5	–	NA	NA	NA	NA	<5	–	<5	–
Luton and Dunstable University Hospital NHS Foundation Trust	Luton & Dunstable Hospital	80	26	38%	NA	NA	<5	–	18	22%	<5	–
Maidstone and Tunbridge Wells NHS Trust	Tunbridge Wells Hospital	48	10	25%	<5	100%	6	67%	38	79%	33	69%
Manchester University NHS Foundation Trust	Royal Manchester Children's Hospital	34	5	17%	NA	NA	0	0%	6	18%	0	0%
Manchester University NHS Foundation Trust	Wythenshawe Hospital	72	29	59%	NA	NA	0	0%	48	67%	55	76%
Mid Cheshire Hospitals NHS Foundation Trust	Leighton Hospital	42	7	21%	0	0%	<5	–	19	45%	38	90%
Mid Essex Hospital Services NHS Trust	Broomfield Chelmsford	46	8	22%	NA	NA	<5	–	30	65%	<5	–

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Mid Yorkshire Hospitals NHS Trust	Pinderfields General Hospital	127	45	40%	<5	–	8	26%	60	47%	21	17%
Milton Keynes University Hospital NHS Foundation Trust	Milton Keynes General Hospital	92	14	22%	<5	100%	6	55%	33	36%	17	18%
Norfolk and Norwich University Hospitals NHS Foundation Trust	Norfolk and Norwich Hospital	88	19	31%	NA	NA	12	57%	73	83%	35	40%
North Cumbria Integrated Care NHS Foundation Trust	Cumberland Infirmary	42	8	25%	<5	100%	0	0%	23	55%	7	17%
North Cumbria Integrated Care NHS Foundation Trust	West Cumberland Infirmary	34	9	28%	NA	NA	7	54%	34	100%	34	100%
North Middlesex University Hospital NHS Trust	North Middlesex Hospital	90	44	52%	NA	NA	<5	–	32	36%	43	48%
North Tees and Hartlepool NHS Foundation Trust	University Hospital of North Tees	61	12	31%	<5	100%	5	56%	58	95%	23	38%
North West Anglia NHS Foundation Trust	Hinchingbrooke Hospital	28	5	25%	NA	NA	0	0%	11	39%	6	21%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%	95%		
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
North West Anglia NHS Foundation Trust	Peterborough City Hospital	50	15	39%	NA	NA	<5	–	32	65%	<5	–
Northampton General Hospital NHS Trust	Northampton General Hospital	67	18	34%	NA	NA	8	57%	51	76%	31	46%
Northern Devon Healthcare NHS Trust	North Devon District Hospital	25	7	50%	<5	100%	<5	–	25	100%	18	72%
Northern Lincolnshire and Goole NHS Foundation Trust	Diana, Princess of Wales Hospital	34	5	19%	<5	–	<5	–	25	74%	6	18%
Northern Lincolnshire and Goole NHS Foundation Trust	Scunthorpe General Hospital	42	6	27%	NA	NA	<5	–	20	48%	12	29%
Northumbria Healthcare NHS Foundation Trust	Northumbria Specialist Emergency Care Hospital	122	36	32%	NA	NA	<5	–	112	97%	<5	–
Nottingham University Hospitals NHS Trust	Nottingham Children's Hospital (QMC Paediatrics)	78	0	0%	0	0%	0	0%	<5	–	0	0%
Pennine Acute Hospitals NHS Trust	North Manchester General Hospital	65	43	70%	<5	100%	5	45%	24	37%	<5	–

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked		Personalised asthma action plan	
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Pennine Acute Hospitals NHS Trust	Royal Oldham Hospital	63	6	23%	NA	NA	0	0%	46	73%	0	0%
Poole Hospital NHS Foundation Trust	Poole General Hospital	142	24	22%	<5	100%	0	0%	120	85%	<5	–
Portsmouth Hospitals NHS Trust	Queen Alexandra Hospital	52	17	44%	<5	100%	<5	–	38	73%	5	10%
Royal Berkshire NHS Foundation Trust	Royal Berkshire Hospital	78	21	30%	NA	NA	5	62%	28	36%	<5	–
Royal Cornwall Hospitals NHS Trust	Royal Cornwall Hospital	83	18	32%	NA	NA	<5	–	49	59%	57	69%
Royal Devon and Exeter NHS Foundation Trust	Royal Devon and Exeter Hospital	111	16	18%	NA	NA	7	33%	83	75%	88	79%
Royal Surrey County Hospital NHS Foundation Trust	Royal Surrey County Hospital	13	<5	–	NA	NA	NA	NA	12	92%	<5	–
Royal United Hospitals Bath NHS Foundation Trust	Royal United Hospital Bath	40	11	52%	<5	100%	<5	–	12	30%	25	62%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked		Personalised asthma action plan	
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Salford Royal NHS Foundation Trust	Salford Royal	70	15	23%	NA	NA	0	0%	10	17%	55	93%
Salisbury NHS Foundation Trust	Salisbury District Hospital	18	<5	–	<5	100%	0	0%	6	33%	<5	–
Sandwell and West Birmingham Hospitals NHS Trust	Birmingham City Hospital	56	19	39%	NA	NA	6	46%	42	75%	47	84%
Sandwell and West Birmingham Hospitals NHS Trust	Sandwell District Hospital	59	20	43%	NA	NA	8	62%	38	64%	50	85%
Sheffield Children's NHS Foundation Trust	Sheffield Children's Hospital	86	41	52%	<5	100%	9	43%	45	52%	49	57%
Sherwood Forest Hospitals NHS Foundation Trust	King's Mill Hospital	36	10	34%	NA	NA	<5	–	11	31%	12	33%
South Tees Hospitals NHS Foundation Trust	James Cook University Hospital	90	20	25%	<5	–	6	35%	53	59%	39	43%
South Warwickshire NHS Foundation Trust	Warwick Hospital	48	16	37%	NA	NA	0	0%	18	38%	20	42%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Southend University Hospital NHS Foundation Trust	Southend Hospital	42	10	27%	NA	NA	<5	–	10	24%	5	12%
Southport and Ormskirk Hospital NHS Trust	Ormskirk District General Hospital	63	31	60%	NA	NA	0	0%	22	35%	17	27%
St George's University Hospitals NHS Foundation Trust	St George's Hospital	72	9	14%	NA	NA	9	82%	52	72%	52	72%
St Helens and Knowsley Teaching Hospitals NHS Trust	Whiston Hospital	107	41	43%	<5	–	<5	–	64	60%	15	14%
Stockport NHS Foundation Trust	Stepping Hill Hospital	31	8	44%	NA	NA	<5	–	25	81%	<5	–
Surrey and Sussex Healthcare NHS Trust	East Surrey Hospital	35	14	48%	NA	NA	<5	–	16	46%	7	20%
Tameside and Glossop Integrated Care NHS Foundation Trust	Tameside General Hospital	131	49	49%	<5	100%	<5	–	17	13%	34	26%
Taunton and Somerset NHS Foundation Trust	Musgrove Park Hospital	46	9	38%	NA	NA	5	36%	22	48%	33	72%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
The Dudley Group NHS Foundation Trust	Russells Hall Hospital	31	7	28%	NA	NA	<5	–	16	52%	10	32%
The Hillingdon Hospitals NHS Foundation Trust	Hillingdon Hospital	159	40	28%	NA	NA	21	70%	146	92%	148	93%
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	Great North Children's Hospital	108	27	37%	<5	100%	6	21%	27	25%	37	34%
The Princess Alexandra Hospital NHS Trust	Princess Alexandra Hospital	<5	<5	–	NA	NA	NA	NA	<5	100%	0	0%
The Rotherham NHS Foundation Trust	Rotherham General Hospital	51	14	30%	NA	NA	<5	–	36	71%	13	25%
The Royal Wolverhampton NHS Trust	New Cross Hospital	127	48	46%	NA	NA	12	43%	126	99%	48	38%
Torbay and South Devon NHS Foundation Trust	Torbay Hospital	45	11	34%	<5	100%	<5	–	26	58%	24	53%
United Lincolnshire Hospitals NHS Trust	Lincoln County Hospital	35	16	53%	NA	NA	<5	–	6	17%	9	26%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
United Lincolnshire Hospitals NHS Trust	Pilgrim Hospital	32	12	44%	<5	100%	<5	–	16	50%	27	84%
University College London Hospitals NHS Foundation Trust	University College Hospital	60	23	41%	6	100%	13	100%	57	95%	49	82%
University Hospital Southampton NHS Foundation Trust	Southampton General Hospital	69	14	31%	<5	–	<5	–	37	54%	31	46%
University Hospitals Bristol NHS Foundation Trust	Bristol Royal Hospital for Children	58	9	24%	<5	–	<5	–	30	52%	47	81%
University Hospitals Coventry and Warwickshire NHS Trust	University Hospital Coventry	103	13	15%	NA	NA	13	39%	80	78%	59	57%
University Hospitals of Derby and Burton NHS Foundation Trust	Queen's Hospital	<5	<5	–	NA	NA	NA	NA	0	0%	0	0%
University Hospitals of Derby and Burton NHS Foundation Trust	Royal Derby Hospital	<5	0	0%	NA	NA	NA	NA	<5	–	0	0%
University Hospitals of Leicester NHS Trust	Leicester Royal Infirmary	10	7	88%	NA	NA	NA	NA	7	70%	<5	–

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
University Hospitals of Morecambe Bay NHS Foundation Trust	Furness General	17	<5	–	NA	NA	<5	100%	15	88%	16	94%
University Hospitals of Morecambe Bay NHS Foundation Trust	Royal Lancaster Infirmary	62	11	22%	NA	NA	<5	–	58	94%	34	55%
University Hospitals of North Midlands NHS Trust	Royal Stoke University Hospital	187	59	38%	<5	–	18	25%	178	95%	170	91%
University Hospitals Plymouth NHS Trust	Derriford Hospital	20	5	33%	<5	100%	<5	–	11	55%	10	50%
Walsall Healthcare NHS Trust	Manor Hospital	97	9	20%	<5	–	<5	–	83	86%	63	65%
Warrington and Halton Hospitals NHS Foundation Trust	Warrington District General Hospital	35	13	45%	NA	NA	<5	–	28	80%	<5	–
West Hertfordshire Hospitals NHS Trust	Watford General Hospital	40	6	16%	NA	NA	<5	–	15	38%	0	0%
West Suffolk NHS Foundation Trust	West Suffolk Hospital	55	10	26%	NA	NA	5	71%	27	49%	33	60%

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Western Sussex Hospitals NHS Foundation Trust	St Richard's Hospital	30	13	50%	<5	100%	<5	–	22	76%	20	69%
Western Sussex Hospitals NHS Foundation Trust	Worthing Hospital	51	24	57%	NA	NA	5	71%	37	73%	35	69%
Whittington Health NHS Trust	Whittington Hospital	42	15	37%	NA	NA	9	82%	28	67%	39	93%
Wirral University Teaching Hospital NHS Foundation Trust	Arrowe Park Hospital	40	19	59%	NA	NA	<5	–	30	75%	33	82%
Worcestershire Acute Hospitals NHS Trust	Worcestershire Royal Hospital	65	13	27%	NA	NA	<5	–	44	68%	61	94%
Wrightington, Wigan and Leigh NHS Foundation Trust	Royal Albert Edward Infirmary	34	11	37%	NA	NA	0	0%	<5	–	0	0%
Wye Valley NHS Trust	County Hospital Hereford	23	5	50%	NA	NA	<5	–	17	74%	15	65%
York Teaching Hospital NHS Foundation Trust	Scarborough General Hospital	23	15	71%	NA	NA	0	0%	20	87%	<5	–

Trust name	Hospital name	Cases audited	Steroids* within 1 hour		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked		Personalised asthma action plan	
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
York Teaching Hospital NHS Foundation Trust	York District Hospital	13	<5	–	NA	NA	<5	100%	7	54%	<5	–
Scotland												
NHS Borders	Borders General Hospital	13	<5	44%	NA	NA	0	0%	7	54%	5	38%
NHS Fife	Victoria Hospital (Kirkcaldy)	28	8	33%	NA	NA	<5	–	27	100%	26	96%
NHS Grampian	Dr Gray's Hospital	<5	NA	NA	NA	NA	0	0%	<5	100%	0	0%
NHS Grampian	Royal Aberdeen Children's Hospital	8	<5	–	NA	NA	0	0%	<5	–	0	0%
NHS Greater Glasgow & Clyde	Royal Hospital for Children	13	5	83%	NA	NA	0	0%	<5	–	12	92%
NHS Lothian	Royal Hospital for Sick Children (Edinburgh)	<5	NA	NA	NA	NA	NA	NA	0	0%	<5	–
NHS Tayside	Ninewells Hospital	37	8	38%	<5	100%	0	0%	24	65%	28	76%
Wales												

Trust name	Hospital name	Cases audited	Steroids*		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked		Personalised asthma action plan	
			within 1 hour									
National QI aim		–	95%		95%		95%		95%		95%	
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Aneurin Bevan University Local Health Board	Nevill Hall Hospital	13	<5	–	NA	NA	<5	–	10	77%	0	0%
Betsi Cadwaladr University Local Health Board	Ysbyty Gwynedd Hospital	15	<5	–	NA	NA	<5	–	<5	–	0	0%
Cardiff & Vale University Local Health Board	University Hospital of Wales	49	27	63%	NA	NA	<5	–	31	63%	24	49%
Cwm Taf Morgannwg University Local Health Board	Prince Charles Hospital	58	12	27%	NA	NA	<5	–	56	97%	29	50%
Cwm Taf Morgannwg University Local Health Board	Royal Glamorgan	46	14	38%	<5	100%	12	80%	45	98%	42	91%
Hywel Dda University Local Health Board	Bronglais General Hospital	7	0	0%	NA	NA	NA	NA	0	0%	0	0%
Hywel Dda University Local Health Board	Glangwili General Hospital	55	21	57%	NA	NA	0	0%	<5	–	0	0%
Swansea Bay Local Health Board	Morrison Hospital	28	5	24%	NA	NA	0	0%	8	29%	7	25%

Trust name	Hospital name	Cases audited	Steroids* within 1 hour		Patient tobacco dependency addressed		Parent/carer tobacco dependency addressed		Inhaler technique checked	Personalised asthma action plan		
National QI aim		–	95%		95%		95%		95%	95%		
National	National	8,506	2,484	36%	57	78%	547	37%	5,246	62%	3,852	45%
Swansea Bay Local Health Board	Princess of Wales Hospital	40	8	23%	NA	NA	6	67%	32	80%	36	90%

Audited case numbers may not match the number and percentage given due to different denominators required for some questions

**95% of children and young people aged 6 years or older who present with severe or life-threatening asthma attacks should have systemic steroids administered within 1 hour*

6.2 Non-participating hospitals in England, Wales and Scotland

Below is the full list of non-participating hospitals, including those that either did not register for the audit (denoted in grey), or were registered, but did not enter any data for the period reported on in this analysis.

Trust / health board	Hospital
England	
Barts Health NHS Trust	Royal London Hospital
Blackpool Teaching Hospitals NHS Foundation Trust	Victoria Hospital
East and North Hertfordshire NHS Trust	Lister Hospital
East Cheshire NHS Trust	Macclesfield District General Hospital
East Suffolk and North Essex NHS Foundation Trust	Colchester General Hospital
Gloucestershire Hospitals NHS Foundation Trust	Gloucestershire Royal Hospital
London North West Healthcare NHS Trust	Northwick Park Hospital
Medway NHS Foundation Trust	Medway Maritime Hospital
Oxford University Hospitals NHS Foundation Trust	Horton General Hospital
Oxford University Hospitals NHS Foundation Trust	John Radcliffe Hospital
Royal Free London NHS Foundation Trust	Barnet Hospital
Royal Free London NHS Foundation Trust	Royal Free Hospital
Shrewsbury and Telford Hospital NHS Trust	Princess Royal Hospital, Telford
South Tyneside and Sunderland NHS Foundation Trust	Sunderland Royal Hospital
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	The Queen Elizabeth Hospital
University Hospitals Birmingham NHS Foundation Trust	Birmingham Heartlands Hospital
University Hospitals Birmingham NHS Foundation Trust	Good Hope Hospital
Yeovil District Hospital NHS Foundation Trust	Yeovil District Hospital
Scotland	
NHS Ayrshire & Arran	University Crosshouse Hospital
NHS Dumfries & Galloway (G)	Dumfries & Galloway Royal Infirmary
NHS Forth Valley	Forth Valley Royal Hospital
NHS Greater Glasgow & Clyde (G)	Royal Alexandra Hospital
NHS Highland (G)	Raigmore Hospital
NHS Lanarkshire	Wishaw General Hospital
NHS Lothian	St John's Hospital at Howden
Wales	
Aneurin Bevan University Local Health Board	Royal Gwent Hospital
Betsi Cadwaladr University Local Health Board	Glan Clwyd Hospital
Betsi Cadwaladr University Local Health Board	Maelor Hospital
Hywel Dda University Local Health Board	Withybush General Hospital

Appendix A: Methodology

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Methodology of the audit creation and setup

A continuous national asthma audit was recommended in the 2014 National Review of Asthma Deaths report following the learnings from the confidential enquiry.⁵ Subsequently, the Asthma Audit Development Project (AADP)⁴ was commissioned between February 2017 and February 2018 to carry out the groundwork required to set up a national audit of asthma care in adult and paediatric secondary care services, as well as primary care. This specifically involved the development of national audit datasets, including the precursor to the current children and young people asthma audit dataset.

The NACAP, which was commissioned from 1 March 2018, launched the children and young people asthma audit component in June 2019. This is the first report for this workstream and presents the results of the cohort of patients who were admitted 1 June 2019 and discharged from hospital by 31 January 2020. The short report, presenting key findings and recommendations, can be found at: www.rcplondon.ac.uk/nacap-cyp-asthma-2019/20. A quality improvement slide set is also provided. Separate reporting outputs will be produced for patients and the public, and will be available at: www.rcplondon.ac.uk/nacap-cyp-asthma-2019/20.

All hospitals in England, Scotland and Wales (n=181) that admit children and young people with asthma attacks were eligible to participate in the audit. A total of 162 hospitals registered for the audit (90%) and 152 (84%) hospitals entered data for this period of the audit. A full list of non-participating hospitals, including those that registered but did not enter any data for the audit period, is provided in [section 6.2](#).

Information governance (IG) and data storage, security and transfer

This audit operates under Section 251 approval in England and Wales from the Confidentiality Advisory Group (CAG) of the Health Research Authority (reference number: 19/CAG/0001), as well as Public Benefit and Privacy Panel for Health approval (reference number: 1718-0134) in Scotland. These approvals allow hospitals to collect patient identifiable data for the audit without consent due to the acuity of the cohort on arrival at hospital and the high number of admissions treated for asthma attacks annually. A record of these approvals can be found at:

- > www.hra.nhs.uk/about-the-hra/our-committees/section-251/cag-advice-and-approval-decisions (April 2013 onwards; non research).
- > www.informationgovernance.scot.nhs.uk/pbpphsc/application-outcomes/
- > (Public Benefit and Privacy Panel (PBPP) Application Outcomes 2018-2019).

To find out more about the audit's IG, legal basis, data storage, security and transfer agreements, please review the CYP asthma fair processing document, IG frequently asked questions (FAQs) and the audit's data flow diagram, all of which can be found on the audit resources page:

www.rcplondon.ac.uk/nacap-cyp-asthma-resources. In addition, patient information leaflets for the following groups:

- > 4–7 year olds.
- > 8 years and over.
- > parents and carers

as well as posters are available to download from the same page.

Recruitment

The recruitment process for this audit started in June 2018 using the following channels:

- > Communication with hospitals in England and Wales.
- > Direct communications to health board chief executives / medical directors as well as local respiratory network leads in Scotland.
- > Partner and stakeholder channels (such as the BTS's e-bulletin, and the Association of Respiratory Nurse Specialists' newsletter).
- > NACAP launch information packs and direct letters sent to directors of trusts/health board chief executives in England, Scotland and Wales.
- > NACAP Twitter and newsletter.

The reasons provided to participate in the audits were as follows:

- > The audit is part of the National Clinical Audit Patient Outcomes Programme (NCAPOP), NHS contracts state that trusts must participate in audits that are part of this programme.
- > The audit is included in the NHS Wales clinical audit and outcome review plan. (<http://www.wales.nhs.uk/governance-emanual/clinical-governance/>).
- > The Care Quality Commission's (CQC's) future use of clinical audit metrics in its hospital inspections in England.
- > The alignment of the audit to National Institute for Health and Care Excellence (NICE) guidance.
- > The fact the audit/s would prove to be a useful tool for facilitating local improvement.

A two-step registration process was followed:

1. All hospitals were required to complete a registration form, providing the contact details and job title of a 'clinical lead' as well as a 'clinical audit lead'. Web tool accounts were set up for these contacts by the RCP audit team.
2. Hospitals in England and Wales were also required to forward a letter directly to their Caldicott Guardian. The letter provided an overview of the audit and the legal approvals in place to collect patient-identifiable data without consent. Caldicott Guardians were required to populate, sign and return a form to confirm approval in order for eligible hospitals in their trust / health board to take part. Only after both the registration form *and* Caldicott Guardian form were completed did the audit team at the RCP consider the hospital as fully registered and approve hospital access to the audit web tool.
 - a. In Scotland, Caldicott Guardian approval was not required for individual hospitals / health boards as the Public Benefit and Privacy Panel for Health approval is deemed to be the ultimate information governance authorisation (precluding the need for any others). Therefore, teams were asked to forward a letter to their Caldicott Guardian for information purposes only.

The contacts provided within the hospital registration form were registered in the web tool as having one of two roles: 'lead clinician' or 'data inputter'. The former were able to approve the creation of new users for that hospital following the launch of the audit, as well as ensure that new users were suitable from an information governance perspective. The latter were able to create account requests for new users which required approval by the lead clinician.

The audit team chased the registration and Caldicott Guardian forms up to, and post launch of the audit.

Audit question development and pilot

The audit dataset was developed during the Asthma Audit Development Project (AADP)^{***} and further streamlined by the NACAP team and clinical lead, in consultation with the NACAP asthma advisory group. A pilot audit was carried out between 18 February and 15 March 2019. Hospitals participating in the audit were asked to assess the comprehensibility of the questions and answers, ensure the help text and rationale were comprehensive, identify opportunities for streamlining the dataset and assess the strength and accuracy of validations applied within the web tool.

The feedback from the pilot was discussed and reviewed by the NACAP team (including the analysis team at Imperial College London) before the dataset was amended and finalised ahead of the launch. Please note that all dataset items are mapped to relevant guidelines and standards. It is available to download from our website: www.rcplondon.ac.uk/nacap-cyp-asthma-resources

Development of patient priorities for this report

The NACAP team has worked in collaboration with the Royal College of Paediatrics and Child Health &Us (RCPCH &Us) to develop the current patient priorities. RCPCH &Us is part of The Royal College of Paediatrics and Child Health (RCPCH), they work across the UK to support children, young people and families to have their voice heard in improving child health policy and practice. RCPCH &Us has been working with young patients, siblings and families as part of NACAP, so that their voices can inform and influence asthma care now and in the future. Asthma voice and participation sessions have taken place across England and Wales in clinics, schools, and on projects. Online surveys have also taken place and the feedback was collated and shared with the NACAP team. RCPCH&Us are thankful to all the children, young people and families who have taken part.

Data entry

Hospitals are required to enter data via the audit programme's bespoke web tool, created by Crown Informatics Ltd (available at www.nacap.org.uk).

Guidance documentation to support participation in the audit, such as the dataset with help notes, data collection sheets, audit technical guidance and FAQs are available to download from both the web tool (www.nacap.org.uk) and the children and young people's asthma audit resources webpage on the RCP website (www.rcplondon.ac.uk/nacap-cyp-asthma-resources). Data entry to the audit is regularly reviewed by the NACAP team. Reminders about audit data entry timelines, tailored to hospitals participating at different rates (ie hospitals with 0 records, fewer than 20 records, fewer than 50 records as appropriate), are sent to registered teams to support continuous data collection. Data entry deadlines are also provided on the homepage of the audit web tool once users are logged in, as well as through NACAP newsletters. The NACAP team also communicate directly with non-participating hospitals to understand the reasons behind lack of participation, providing advice where possible.

^{***} For more information about the AADP and the development of the initial CYP asthma audit dataset visit: www.rcplondon.ac.uk/projects/asthma-audit-development-project

Telephone and email support

The audit programme team at the RCP provide a helpdesk 9am – 5pm every working day, which is available via both telephone and email, so that participants can contact the team directly with any questions.

Analysis methodology

Deadline and data transfer

The data entry deadline for completion of records (patients admitted from 1 June 2019 and discharged from hospital by 31 January 2020) was 13 March 2020 at 23:59. Thereafter, the data were extracted by Crown Informatics Ltd, drafts were excluded and the data were anonymised as follows:

- > NHS/CHI number replaced by an anonymised patient identifier
- > Date of birth replaced by calculated age.
- > Postcode replaced by a Lower Layer Super Output Area (LSOA)

NB Crown Informatics Ltd also provided date of death data to Imperial College London for analysis.

The anonymised file, containing non-identifiable patient data, was then sent via secure file transfer to the analysis team at Imperial College London where they were analysed.

Case ascertainment

The overall case ascertainment of 69.2% is derived on receipt of overall admission data from external data sources as follows:

- > Data request applications for nation-level admission numbers were submitted to NHS Digital (NHSD) for Hospital Episode Statistics (HES) data, NHS Wales Informatics Service (NWIS) for Patient Episode Database for Wales (PEDW) data and the electronic Data Research and Innovation Service (eDRIS), part of NHS National Services Scotland.
- > The specification for nation-level admissions numbers was as follows:
- > An overall figure for all CYP patients aged 5-18 coded with the following ICD-10 codes in the primary and secondary position of the first episode of care:
 - > J45.0 – Predominantly allergic asthma
 - > J45.1 – Non-allergic asthma
 - > J45.8 – Mixed asthma
 - > J45.9 – Asthma, unspecified
 - > J46.0 – Status asthmaticus (*Includes: Acute severe asthma*)
- > An overall figure for all children aged 1-4 coded with the following ICD-10 codes in the primary position of the first episode of care:
 - > J45.0 – Predominantly allergic asthma
 - > J45.1 – Non-allergic asthma
 - > J45.8 – Mixed asthma
 - > J45.9 – Asthma, unspecified
 - > J46.0 – Status asthmaticus (*Includes: Acute severe asthma*)
 - > R06.2 -Wheezing
 - > B34.9 - Viral infection, unspecified- viral induced wheeze
- > Including only patients aged 1–18 years on the date of arrival.
- > Including only patients who were admitted 1 June 2019 and discharged by 31 January 2020.

Data cleaning and analysis

The data were analysed at Imperial College London. Data received from the RCP were imported into R version 3.6.2.

Data checking and cleaning occurred sequentially as follows:

- > Draft records and test records were removed (n=41).
- > Records marked as overseas were removed (n=24).
- > Times and dates were converted from string to date/time format using the 'as.POSIXct' command in R, and time-to-event data were created using the 'difftime' command on converted time variables. Dates were converted to days of the week using the 'weekdays' command.
- > All patients were admitted and discharged within the correct time frame (admitted from 01/06/2019 and discharged by 31/01/2020).
- > No patients had invalid values for heart rates, respiratory rates, oxygen saturation, or peak flow values, or logical inconsistencies (for example, being recorded as having a value for oxygen saturation but also marked as being 'not recorded').
- > No patients had logical inconsistencies with regards to receipt of inhaled steroids or beta agonist.
- > No patients had a time for their receipt of beta agonists, inhaled steroids, or MDT review that was before their time of arrival or after the time of their discharge.
- > No patients had a discharge time that was before their admission time.
- > The appropriate IMD quintile for England (2019), Scotland (2016) or Wales (2019) was assigned to each patient using the patients' LSOA11 code. 205 patients did not have an LSOA11 code and so could not be linked to an IMD quintile.
- > The 'cut' function or 'ifelse' command in R was used on continuous or discrete variables which required categorisation for analysis (day and time of arrival to hospital (split into two hour or four hour times), PEF as a % of best/predicted PEF (<75%, ≥75%), and time from arrival until receipt of systemic steroids (<1 hour, ≥1 hour)).
- > After data checking and cleaning, a total of 8,506 records remained for analysis.

Data analysis:

- > Median and interquartile ranges were calculated using the 'quantile' command in R.
- > Proportions were calculated using the 'table' and 'prop.table' commands in R.
- > Adjusted odds ratios with confidence intervals were calculated using the 'glmer' command with a clustering variable (hospital) and explanatory variable (discharge bundle, inhaler technique checked, or PAAP checked) connected to the outcome through a binomial logit link.
- > Kaplan-Meier curves were created using the 'survfit' package in R.

Appendix B: BTS/SIGN management of asthma guidelines

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No.	Management of asthma
2.4	Non-pharmacological management
	People with asthma and parents of children with asthma should be advised about the dangers of smoking and second-hand tobacco smoke exposure and be offered appropriate support to stop smoking.
2.5	Pharmacological management
	Inhaled corticosteroids are the recommended preventer drug for adults and children for achieving overall treatment goals.
2.6	Inhaler devices
	Prescribe inhalers only after patients have received training in the use of the device and have demonstrated satisfactory technique.
6.2.3	Smoking
	People with asthma and parents/carers of children with asthma should be advised about the dangers of smoking and second-hand tobacco smoke exposure, and should be offered appropriate support to stop smoking.
9.6.3	Follow-up
	It is essential that the patient's primary care practice is informed within 24 hours of discharge from emergency department or hospital following an asthma attack. Ideally this communication should be directly with a named individual responsible for asthma care within the practice.
9.7.2	Pulse Oximetry
	Consider intensive inpatient treatment of children with SpO ₂ <92% in air after bronchodilator treatment.
9.7.3	Peak expiratory flow
	PEF measurements can be of benefit in assessing children who are familiar with the use of such devices. The best 3 PEF measurements, ideally expressed as a percentage of a personal best, can be useful in assessing the response to treatment. A measurement of <50% predicted PEF or FEV ₁ with poor improvement after initial bronchodilator treatment is predictive of a more prolonged asthma attack.
9.8.1	Oxygen
	Children with life-threatening asthma or SpO ₂ <94% should receive high flow oxygen via a tight-fitting face mask or nasal cannula at sufficient flow rates to achieve normal saturation of 94-98%.
9.8.2	Inhaled short-acting beta agonists
	Inhaled beta agonists are the first line of treatment for acute asthma in children.
9.8.4	Steroid therapy
	Give oral steroids early in treatment of acute asthma attacks in children.
9.9	Second-line treatment of acute asthma in children
	Children with continuing severe asthma despite optimal first-line treatments, frequent nebulised beta agonists and ipratropium bromide plus oral steroids and those with life-threatening features, need urgent review by a specialist with a view to management in an appropriate high-dependency area or transfer to a paediatric intensive care unit to receive second-line intravenous therapies. Three options, IV magnesium sulphate, IV beta agonists or IV aminophylline can be considered.

Appendix C: NICE 2013, updated 2018 asthma guidelines

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	Asthma
No.	Quality statement
2 (2013)	People aged 5 years and over with asthma discuss and agree a written personalised action plan.
3 (2013, updated in 2018)	People with asthma have their asthma control monitored at every review.
4 (2013, updated in 2018)	People who receive treatment in an emergency care setting for an asthma attack are followed up by their general practice within 2 working days of discharge.
7 (2013)	People with asthma who present with an exacerbation of their symptoms receive an objective measurement of severity at the time of presentation
8 (2013)	People aged 5 years or older presenting to a healthcare professional with severe or life-threatening acute exacerbation of asthma receive oral or intravenous steroids within 1 hour of presentation.
9 (2013)	People admitted to hospital with an acute exacerbation of asthma have a structured review by a member of a specialist respiratory team before discharge.

Appendix D: Royal College of Emergency Medicine (RCEM) moderate and severe asthma clinical audit 2016/17

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RCEM moderate and acute severe asthma clinical audit 2016/17
Standard 1a oxygen prescription
O ₂ should be given on arrival to maintain saturation 94–98%
Standard 1b oxygen prescription
O ₂ should be prescribed on arrival to maintain saturation 94–98%
Standard 5 administration of systemic steroids
If not already given before arrival to ED Standard 5a Within 60 minutes of arrival (acute severe) Standard 5b Within 4 hours of arrival (moderate))

Appendix E: Royal of Physicians (RCP), Why Asthma Kills: National Review of Asthma Deaths (NRAD) recommendations

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Medical and professional care
Recommendation 1
All people with asthma should be provided with written guidance in the form of a personal asthma action plan (PAAP) that details their own triggers and current treatment, and specifies how to prevent relapse and when and how to seek help in an emergency.
Recommendation 3
Factors that trigger or exacerbate asthma must be elicited routinely and documented in the medical records and personal asthma action plans (PAAPs) of all people with asthma, so that measures can be taken to reduce their impact.
Organisation of NHS services
Recommendation 2
Patients with asthma must be referred to a specialist asthma service if they have required more than two courses of systemic corticosteroids, oral or injected, in the previous 12 months or require management using British Thoracic Society (BTS) stepwise treatment 4 or 5 to achieve control.
Patient factors and perception of risk
Recommendation 2
A history of smoking and/or exposure to second-hand smoke should be documented in the medical records of all people with asthma. Current smokers should be offered referral to a smoking-cessation service.
Prescribing and medicines use
Recommendation 3
Non-adherence to preventer inhaled corticosteroids is associated with increased risk of poor asthma control and should be continually monitored.

References

1	British Thoracic Society (BTS) / Scottish Intercollegiate Guidelines Network (SIGN). <i>SIGN 158: British guideline on the management of asthma – A national clinical guideline</i> . Revised edition published July 2019. www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/ [Accessed September 2020]
2	National Institute for Health and Care Excellence. <i>Asthma. NICE Quality standard 25 (QS25)</i> . London: NICE, 2013. www.nice.org.uk/guidance/qs25 [Accessed September 2020]
3	Royal College of Emergency Medicine. <i>Moderate and severe asthma clinical audit 2016/17</i> . London: RCEM, 2017. www.rcem.ac.uk/ [Accessed September 2020].
4	Royal College of Physicians. <i>Asthma Audit Development Project (AADP). Phase 2: Final report</i> . London: RCP, 2018. www.rcplondon.ac.uk/projects/asthma-audit-development-project [Accessed September 2020].
5	Royal College of Physicians. <i>Why asthma still kills: the National Review of Asthma Deaths (NRAD) Confidential Enquiry report</i> . London: RCP, 2014. www.rcplondon.ac.uk/projects/national-review-asthma-deaths [Accessed September 2020].
6	National Institute for Health and Care Excellence. <i>Asthma: diagnosis, monitoring and chronic asthma management NICE guideline [NG80]</i> . NICE, 2017. https://www.nice.org.uk/guidance/ng80/chapter/Recommendations#diagnosing-asthma-in-young-children [Accessed March 2021]

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