Royal College of Physicians | NACAP

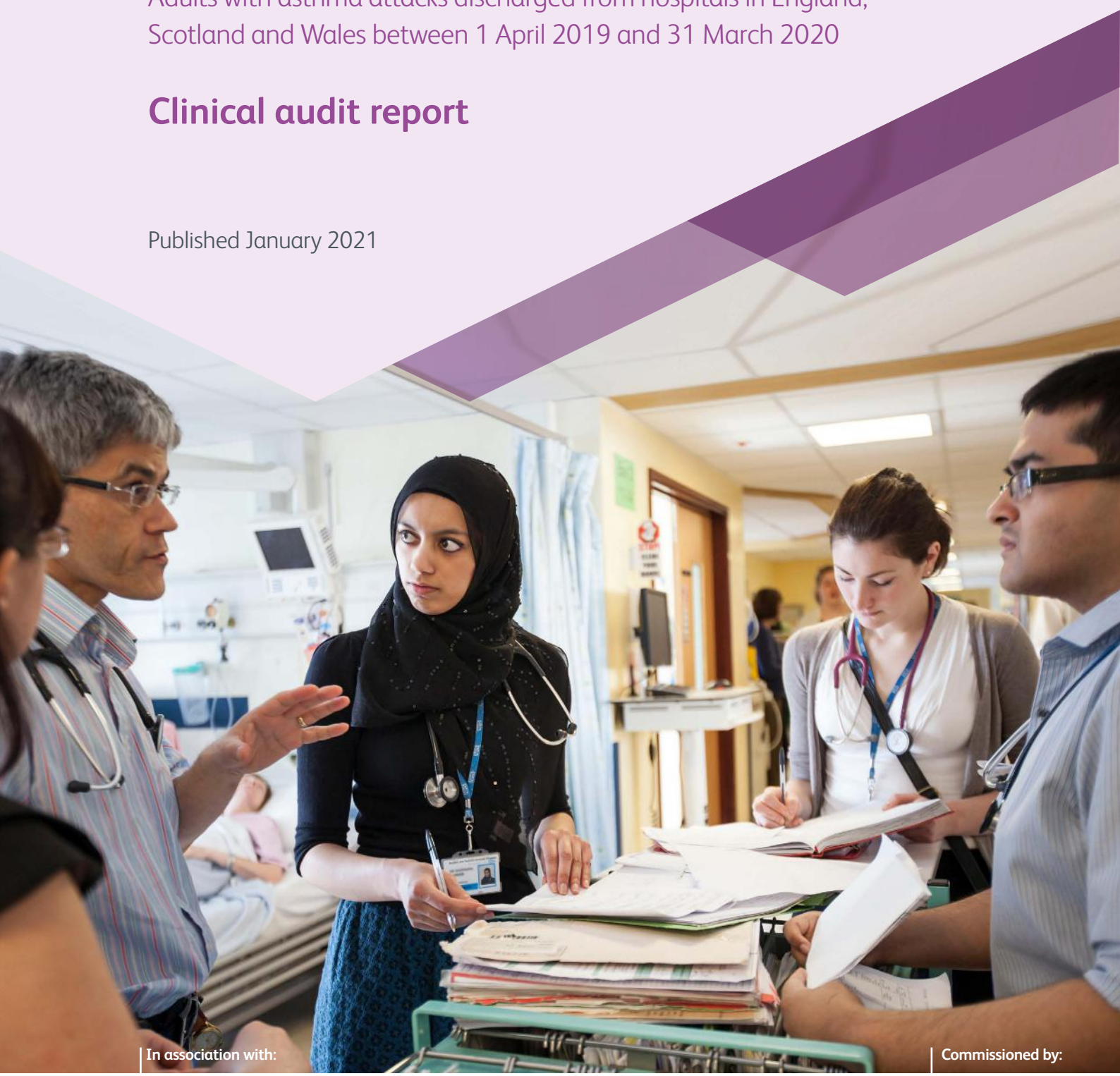
National Asthma and Chronic Obstructive Pulmonary Disease Audit Programme (NACAP)

Adult asthma clinical audit 2019/20

Adults with asthma attacks discharged from hospitals in England, Scotland and Wales between 1 April 2019 and 31 March 2020

Clinical audit report

Published January 2021



In association with:

Commissioned by:

The Royal College of Physicians

The Royal College of Physicians (RCP) plays a leading role in the delivery of high-quality patient care by setting standards of medical practice and promoting clinical excellence. The RCP provides physicians in over 30 medical specialties with education, training and support throughout their careers. As an independent charity representing over 39,000 fellows and members worldwide, the RCP advises and works with government, patients, allied healthcare professionals and the public to improve health and healthcare.

Healthcare Quality Improvement Partnership

The National Asthma and Chronic Obstructive Pulmonary Disease (COPD) Audit Programme (NACAP) is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing, and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies **www.hqip.org.uk/national-programmes.**

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 NACAP visit: **www.rcplondon.ac.uk/nacap**.

Adult asthma clinical audit 2019/20 report

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

Dr James Calvert, adult asthma clinical lead, NACAP, Care Quality Improvement Department (CQID), RCP; consultant respiratory physician, North Bristol NHS Trust; and national specialty advisor for severe asthma
Ms Susan Latchem, programme manager, NACAP, CQID, RCP
Ms Rachael Andrews, deputy programme manager, NACAP, CQID, RCP
Ms Eloya Imoedemhe, project manager, NACAP, CQID, RCP
Ms Sophie Robinson, project manager, NACAP, CQID, RCP
Ms Niamo Yassin, programme coordinator, NACAP, CQID, RCP
Mr Tim Bunning, principal consultant, Crown Informatics
Mr Alex Adamson, research assistant in medical statistics, National Heart & Lung Institute, Imperial College London
Mr Philip Stone, research assistant in statistics/epidemiology, National Heart & Lung Institute, Imperial College London
Professor Jennifer Quint, analysis lead, NACAP, CQID, RCP, London; professor of respiratory epidemiology, National Heart & Lung Institute, Imperial College London; and honorary respiratory consultant, Royal Brompton and Imperial NHS trusts
Professor C Mike Roberts MA MD FRCP FAcadMEd, managing director, UCLPartners Academic Science Partnership; professor, Medical Education for Clinical Practice, Institute of Population Health Sciences, Queen Mary University London; deputy director, NIHR North Thames Applied Research Collaboration; and senior clinical lead, NACAP, CQID, RCP

Citation for this document: Calvert J, Latchem S, Andrews R, Imoedemhe E, Robinson S, Yassin N, Bunning T, Adamson A, Stone P, Quint J, Roberts CM. *National Asthma and Chronic Obstructive Pulmonary Disease Audit Programme (NACAP): Adult asthma clinical audit 2019/20 (Adults with asthma attacks discharged from hospitals in England, Scotland and Wales between 1 April 2019 and 31 March 2020). Clinical audit report*. RCP: London, 2021.

Royal College of Physicians
Care Quality Improvement Department
11 St Andrews Place
Regent's Park
London NW1 4LE

ISBN: 978-1-86016-825-3
eISBN: 978-1-86016-826-0

Registered charity no 210508

www.rcplondon.ac.uk/nacap-adult-asthma @NACAPaudit #AdultAsthmaAudit #AsthmaAuditQI

Contents

Report at a glance

Results are based on 19,360 patients admitted to hospital with an asthma attack who were discharged between 1 April 2019 and 31 March 2020.

28.3% of all patients had a peak flow measurement recorded within 1 hour of arrival at hospital

QI priority 1: Ensure 90% of patients presenting with an asthma attack are assessed for asthma severity, including measurement of peak flow, within 1 hour

52.9% of all patients had this taken within 4 hours of arrival at hospital

74.6% of patients had this taken at some point during admission to hospital

21.2% of patients had no peak flow measurement recorded during their admission (4.1% of patients were recorded as too unwell to have their peak flow measurement taken)

81.1% of patients were reviewed by a respiratory specialist during their admission

QI priority 2: Ensure 90% of patients receive respiratory specialist review during hospital admission

68.4% of all patients received a respiratory specialist review within 24 hours of arrival (weekdays, Monday 8am – Friday 5pm)

56.0% of all patients received a respiratory specialist review within 24 hours of arrival (weekends, Friday 5pm – Monday 8am)

30.6% of patients were administered systemic steroids within 1 hour of arrival at hospital*

QI priority 3: Ensure 95% of patients who have not been administered systemic steroids as part of pre-hospital care are administered this treatment within 1 hour of arrival at hospital

65.8% of patients were administered these within 4 hours of arrival*

87.4% of patients were administered these at some point following arrival at hospital*

*Please note that the audit dataset did not collect data on the proportion of patients who received their first dose of systemic steroids prior to arrival at hospital in this round of reporting.

How to use this report

1. Scope and data collection

The adult asthma clinical audit, a component of the National Asthma and COPD Audit Programme (NACAP), launched in November 2018 and captures the processes and clinical outcomes of treatment for patients admitted to hospital in England, Scotland and Wales with asthma attacks.*

This report, which is the second since the launch of the audit, presents data describing the cohort of patients discharged between 1 April 2019 and 31 March 2020.

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

The report highlights three key areas to focus local QI in 2020/21. Providers and commissioners should consider how these can be delivered locally for the benefit of patients and the healthcare system. A selection of case studies, provided by participating hospital teams, are included in the report to showcase good practice. In addition, tips on achieving the QI priorities are included in the relevant sections of the report. For more information about the delivery of QI within the NACAP, please view the programme's QI strategy available at: **www.rcplondon.ac.uk/projects/outputs/national-asthma-and-copd-audit-programme-nacap-quality-improvement-resources.**

2. Indicators included

Key process measures included in this report are based on the improvement objectives outlined in the first NACAP adult asthma audit report. These include review by a member of the respiratory team; measurement of peak expiratory flow (PEF) as a measure of exacerbation severity; timely administration of systemic steroids and β_2 agonists; and provision of elements of good practice care at the point of hospital discharge. The outcome measures included in this report are length of stay and inpatient mortality.

An addendum to 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 adult patients admitted to hospital with an asthma attack who were included in the audit, as well as their outcomes post discharge. With each 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.

A separate data analysis and methodology report is available at: **www.rcplondon.ac.uk/adult-asthma-2019-20.** The data analysis and methodology report provides the following information:

- the full data analyses, presented with England, Scotland and Wales results, as well as combined results for all three countries denoted as 'All' in tables and figures, with explanatory notes throughout
- a sub analysis section which provides further context of the data
- nationally benchmarked results for participating hospitals, using variables based on national guidelines and standards
- appendices, including the methodology for the audit.

* The other components of the NACAP will report separately. These reports can be viewed on the **NACAP web pages**.

It is not necessary to review the full analysis to appreciate the key messages available in this short report which are drawn from the full analysis.

Additional outputs

- Provider-level aggregated audit data will be made publicly available on **www.data.gov.uk** and on the NACAP webpages, in line with the government's transparency agenda. Providers will be able to use this data to benchmark all reported metrics (all data items) against all participating services.
- Site level reports produced alongside the national reports and provided to individual sites will enable services to benchmark their performance against national results.
- Authorised hospital web tool users (typically members of hospital, respiratory and audit teams who are inputting the data) can download their raw audit data via the audit web tool at any time.
- Run charts for key dataset metrics are also accessible for authorised hospital web tool users to access; these display audit data in real time at provider and national level to support local quality improvement.

Copies of our datasets, our good practice repository and all other resources can be found via our website: **www.rcplondon.ac.uk/nacap-adult-asthma.**

3. Report coverage

National breakdowns for England, Scotland and Wales, as well as 'All' figures are provided in a separate data analysis and methodology report available at **www.rcplondon.ac.uk/adult-asthma-2019-20**.

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, service commissioners and policymakers, as well as voluntary organisations and patients. A separate report has also been produced specifically for patients and the public and is available at: **www.rcplondon.ac.uk/adult-asthma-2019-20**. However, where a certain area of care has been highlighted by the NACAP patient panel as a priority for patients, this is shown with the patient priority icon displayed below.

References to the appropriate National Institute for Health and Care Excellence (NICE) quality standards, British Thoracic Society (BTS) / Scottish Intercollegiate Guidelines Network (SIGN) guideline on the management of asthma and **National Review of Asthma Deaths (NRAD) 2014 report** recommendations are inserted throughout the key findings.

Foreword by James Calvert, adult asthma audit clinical lead

Welcome to the second audit report describing care provided to 19,360 adult patients admitted to hospital with asthma attacks in the UK and discharged between 1 April 2019 and 31 March 2020. The report is published following a period of unprecedented pressure in the NHS. Respiratory teams across the UK have been at the forefront of the country's response to the COVID-19 pandemic. As I write, it seems likely that the way in which we deliver healthcare is going to be disrupted for the foreseeable future. However, the needs of our patients, and the requirement to deliver the highest possible standard of care, continues unchanged.

The previous **NACAP adult asthma audit report**, which included recommendations made by the programme, was published in December 2019, shortly before the peak of the pandemic phase of COVID-19 and the data in this report continues to articulate clear areas where service improvement is needed. If we fail to meet this challenge, then we will have missed an opportunity to meet our obligation to our patients to provide the highest standards of care – irrespective of the circumstances we find ourselves in.

We have structured the report to emphasise three important areas where we suggest service redesign should be considered: emergency care following the patient's arrival in hospital, the quality of care at discharge and the need for specialist input into delivery of care pathways.

The audit data suggests that timely assessment of the severity of asthma attacks is not taking place when patients arrive in hospital. Peak expiratory flow (PEF) is only measured in 28% of patients within 1 hour of hospital arrival and is not recorded for 21% of patients. Administration of systemic steroids continues to be delayed with only 30.6% receiving steroids within an hour of arrival at hospital. Section 5 of the report focuses on the importance of 'The first hour of care' – now is the time for us to advocate that patients with asthma attacks receive the same priority care as other critically unwell patients.

Finally, a common theme throughout the audit is the huge value provided by respiratory specialist teams. Once again, the data suggests improved processes of care and improved outcomes when patients are seen by a member of the specialist team. A care bundle was delivered in 69.2% of patients seen by a member of the specialist team and in only 8.3% of those who did not. Patients who received a respiratory specialist review were also between 7 and 24 times as likely to receive individual elements of the discharge bundle compared with patients who did not.

Troublingly, compared with the **2018/19 report,** there was a non-statistically significant trend towards increased mortality in patients who did not receive a specialist review. Patients who received a specialist review were half as likely to die as an inpatient, compared with patients who did not receive a specialist review. We have given more detail of the treatment received by patients who died in Section 6 of the report. Clinicians, providers and commissioners need to work hard to ensure that all patients receive access to a specialist standard of care, in all circumstances.

The NACAP team at the RCP are working hard to develop resources that will support teams dedicated to improving care, even during these challenging times. My thanks once again goes to the NACAP team and all of the busy and dedicated clinicians and members of the multidisciplinary teams (MDT) across the country who have committed their time and expertise to the collection of data used in the audit, which is signposting the way ahead for the improvement of asthma services. My thanks also goes to the patients who have helped the NACAP team to shape the audit measures and to reflect on what matters most to them.

Quality improvement priorities and recommendations in line with NCAPOP guidance

Quality improvement priorities for providers

We have defined three key national quality improvement (QI) priorities for 2019/20, selected for their effectiveness in improving outcomes. These priorities are as follows for the next year:

1. **QI priority 1**: Assess 90% of patients for asthma severity which includes measurement of PEF within 1 hour of arrival. **(BTS/SIGN 2019 [Guideline recommendations: 9.2.3, 9.2.6])**
2. **QI priority 2**: Provide 90% of patients with a respiratory specialist review during hospital admission**. This is also the patient priority for the adult asthma clinical audit, as selected by the NACAP patient panel**. **(NICE 2013 QS25 [QS9])**
3. **QI priority 3:** Administer systemic steroids to 95% of patients within 1 hour of arrival at hospital, unless these have been administered as part of pre-hospital care **(NICE 2013 QS25 [QS8])**.

Recommendations for commissioners / health boards / sustainability transformation partnerships (STPs) and integrated care systems (ICSs)

1. Provide continuing support to enable local secondary care providers to participate in the NACAP adult asthma audit. **(NRAD 2014 [Organisation of NHS services – recommendation 6])**
2. Review local secondary care provider capacity to enable sufficient numbers of trained staff in the specialist respiratory team to review all patients admitted with an asthma attack.
3. Provide patients who are current smokers with access to high-quality smoking cessation services. **(BTS/SIGN 2019 [Guideline 6.2.3] / NICE 2013 QS43 [QS1-5])**
4. Treat each asthma death as a serious untoward incident (SUI) and ensure that these deaths are investigated.
5. Provide each patient admitted to hospital with an asthma attack with access to specialist care 24 hours a day, 7 days a week.

Recommendations for primary care

1. Check that all asthma patients have an up to date and regularly reviewed personalised asthma action plan (PAAP). **(BTS/SIGN 2019 [Guideline 5.2.2, 14.3.1])**
2. Identify for review, asthma patients in receipt of more than two courses of systemic steroids in the past 12 months.
3. Refer to secondary care if options for optimising care are unclear, or where there is diagnostic uncertainty. **(NRAD 2014 [Organisation of NHS services – recommendation 2, 3])**
4. Provide adequate and continued asthma care training for staff. **(BTS/SIGN 2019 [Guideline 14.2])**

For people living with asthma and their families and carers

1. If you are admitted to hospital with an asthma attack, make sure that arrangements have been made to follow you up as an outpatient after discharge. **(NRAD 2014 [Organisation of NHS services – recommendation 3])**
2. If you are admitted to hospital with an asthma attack, ensure you ask for, and are provided with, a copy of your asthma care bundle (this includes having a personalised asthma action plan (PAAP) updated or issued). **(BTS/SIGN 2019 [Guideline 9.6])**

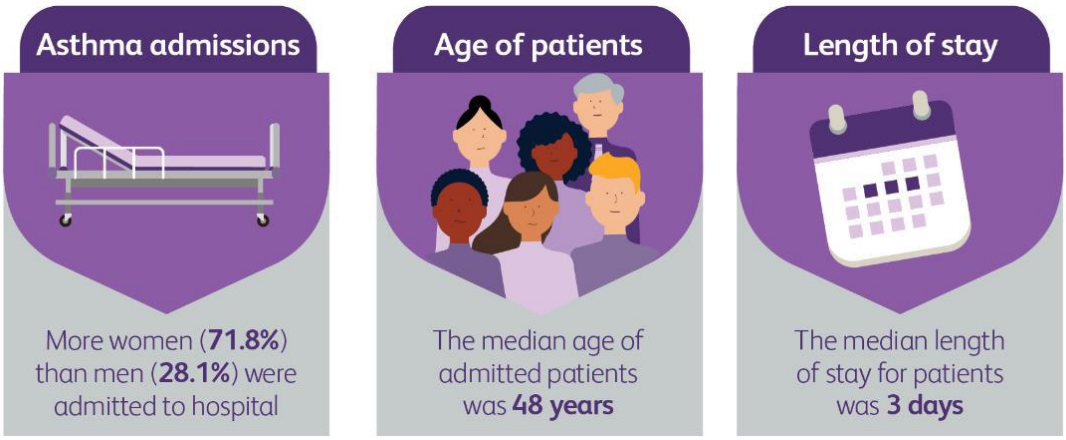
For patient-specific recommendations please view the adult asthma clinical audit patient report, available at: **www.rcplondon.ac.uk/adult-asthma-2019-20.**

Key findings and quality improvement priorities

Section 1:
Understanding the population

To see the data analysis in full for patients admitted to hospital who were discharged between 1 April 2019 and 31 March 2020, please access the data analysis and methodology report available at: ***www.rcplondon.ac.uk/adult-asthma-2019-20.***

Back to contents



Audit results – understanding the population

Admission and demographics

- A significantly higher proportion of adult patients admitted with **asthma attacks** were female (**71.8%**).
- The **median age** at admission was **48 years.**
- More patients were admitted on **weekdays**, from **late morning to early evening**.
- Fewer patients were admitted overnight (10pm to 8am) and at weekends.[†]

Length of stay

- The **median length of stay** for an admission was **3 days**.

Inpatient mortality

- **47 (0.2%)** audited patients admitted for asthma attacks died during their hospital stay. For more information on patients who died as an inpatient, see **Section 6.**

Patient numbers included in the audit (case ascertainment)

- The **overall case ascertainment figure** for the period **1 April 2019 to 31 March 2020** was 35.8% (19,360/54,119 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.

Hospital participation rates

- **77.9%** of eligible hospitals in England, Scotland and Wales participated in the audit **(173/222 hospitals).**
- In **England**, hospital participation was **86.6%** (155/179 hospitals). In **Scotland**, hospital participation was **19.2%** (5/26 hospitals). In **Wales**, hospital participation was **76.5%** (13/17 hospitals).

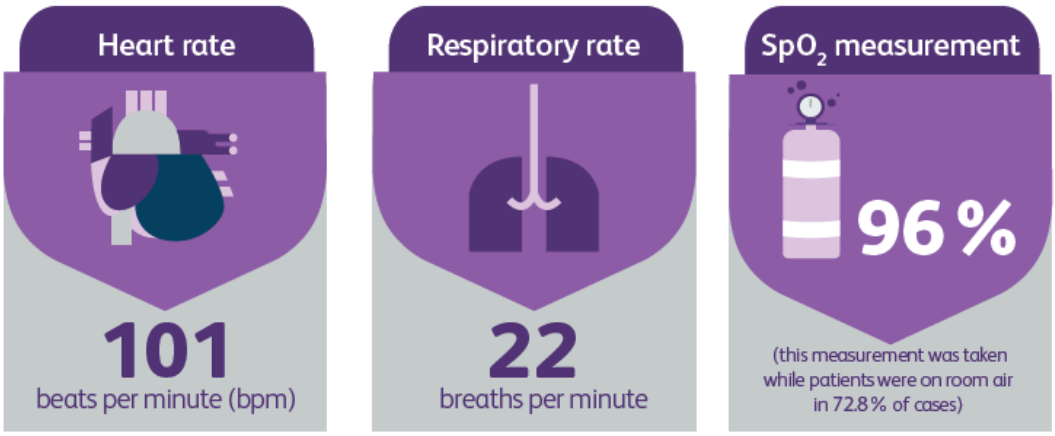
[†] A detailed breakdown of arrival activity can be found in **Table 1.4.2 of the data analysis and methodology report** (day and time of arrival to hospital) available at: **www.rcplondon.ac.uk/adult-asthma-2019-20**

[‡] This percentage was 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. (There were a small number of participating hospitals that either did not submit their adult asthma admissions data to HES or their submissions were not coded correctly and therefore could not be allocated). For more information on the methodology used to calculate this figure, please review Appendix B of the data analysis and methodology report, available at: **www.rcplondon.ac.uk/adult-asthma-2019–20**.

Section 2:
Good practice care on arrival at hospital

To see the data analysis in full for patients admitted to hospital who were discharged between 1 April 2019 and 31 March 2020, please access the data analysis and methodology report available at: ***www.rcplondon.ac.uk/adult-asthma-2019-20.***

Back to contents



Baseline observations

Key standards

> **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.[4]

Audit results – baseline observations

> The median values for first recorded observations were as follows:
  - **heart rate** of **101 beats per minute (bpm)**
  - **respiratory rate** of **22 breaths per minute**
  - **SpO_2 measurement of 96%** (this measurement was taken while patients were on room air in **72.8%** of cases)

Peak expiratory flow (PEF)

75%

of patients had a PEF measurement taken at some point during their admission to hospital

Key standards

- **BTS/SIGN 2019 [9.2.3]:** Measurements of airway calibre improve recognition of the degree of severity, the appropriateness or intensity of therapy, and decisions about management in hospital or at home. PEF or FEV1 are useful and valid measures of airway calibre. PEF is more convenient in the acute situation.[2]
- **BTS/SIGN 2019 [9.2.6]**: Patients whose PEF is greater than 75% best or predicted 1 hour after initial treatment may be discharged from the emergency department (ED) unless they meet any of the following criteria, when admission may be appropriate: still have significant symptoms; concerns about adherence; living alone / socially isolated; psychological problems; physical disability or learning difficulties; previous near-fatal asthma attack; asthma attack despite adequate dose of oral corticosteroid prior to presentation; presentation at night; pregnancy.[2]
- **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.[7]

Audit results – PEF

- **74.6%** of patients had a **recorded PEF measurement** while **21.2%** had **no PEF measurement** recorded during their admission and **4.1%** of patients were **too unwell to have a measurement taken**.
- The **median time to PEF measurement** following arrival at hospital was **3.5 hours** (interquartile range (IQR) 0.8–15.4 hours).
- **28.3%** of all patients with a PEF measurement, and a time for their measurement, **had PEF taken within 1 hour of arrival**.
- **52.9%** of all patients with a PEF measurement, and a time for their measurement, **had PEF taken within 4 hours of arrival**.
- **60%** of patients had a **previous best PEF recorded**. Where a **previous best PEF was not recorded**, **34.2%** of admissions had a **predicted PEF recorded**.
- Of the patients who had a recorded PEF measurement taken, **85.2% had a record of either previous or predicted PEF**.
- The **median PEF on admission** as a percentage of previous best PEF or predicted PEF was **60%** (IQR 45–75%).
- **74.4%** of patients who had a PEF measurement taken and a measurement for either best/predicted PEF had a **PEF measurement of less than 75% as a percentage of best/predicted PEF** following arrival.

National QI priority: Ensure 90% of patients are assessed for asthma severity, including measurement of PEF within 1 hour of arrival. **(BTS/SIGN 2019 [9.2.3, 9.2.6])**

Rationale

There is low attainment nationally for measurement of PEF within 1 hour of arrival. Assessment of severity by PEF measurement is required in order to make the necessary care management plans for the patient's admission **(BTS/SIGN 2019 [9.2.3, 9.2.6]).** Therefore, a 90% QI target has been set, taking into account exception cases where this cannot be recorded (ie where the patient is too unwell).[§]

Processes should be put in place to ensure that information on PEF is collected in a timely manner. Current measures to prevent aerosol generating procedures while in hospital as a result of the COVID-19 pandemic mean that assessment of PEF is more problematic than previously, but the need to ensure accurate assessment of severity of asthma on admission means it remains an important measure.

Tips to achieve this priority

- Survey staff to understand the barriers to measuring PEF in the emergency department.
- Review whether there is sufficient availability of PEF meters in the emergency department, particularly during the busiest periods for admissions (see Table 1.4.2 of the data analysis and methodology report (day and time of arrival at hospital)).
- Provide education and training to staff on PEF measurement and interpretation.
- Encourage use of PEF as part of triage by mandating entry of PEF measurement in electronic systems.
- Work with the ambulance service to include PEF measurement as part of initial assessment.
- Liaise with infection control teams to design processes to permit PEF measurement.

[§] 4.1% of audited patients were too unwell to have PEF measurement taken (see Table 3.2.1 of data analysis and methodology report available at: www.rcplondon.ac.uk/adult-asthma-2019-20.

Case study: Manchester Royal Infirmary (Manchester University NHS Foundation Trust)

Measurement of peak expiratory flow (PEF)

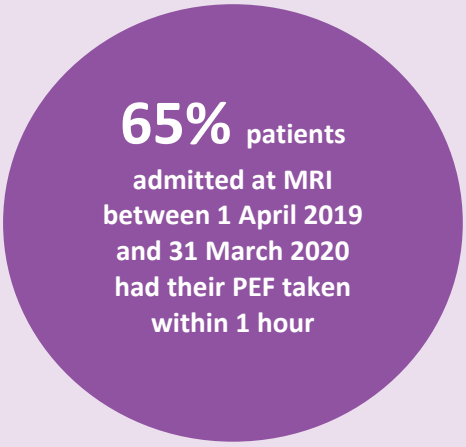
The team has managed to increase the number of patients having a PEF test within the first hour of attending the emergency department (ED) with acute asthma.

The steps taken to improve the team's ability to perform PEF tests within the hospital were identified as follows:

- A departmental audit was carried out which highlighted issues around performing PEF tests.
- Members of the respiratory team met with the ED to discuss and agree the standards of care.
- A further meeting took place to agree on the steps that would be taken for care to improve in this area.
- Ward areas were audited to determine stock levels and levels of appropriate equipment available.
- Ward managers, matrons and the ED pharmacist were alerted to the lack of appropriate equipment and action was taken to resolve this.
- A SurveyMonkey™ questionnaire, developed by the asthma clinical nurse specialist and the ED assistant nurse practitioner, was emailed to staff to identify gaps in knowledge.

The results of these actions were as follows:

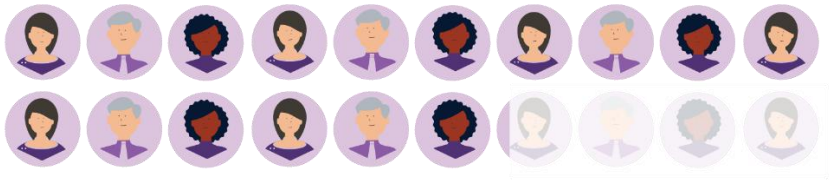
- Increased stock level on the wards/ED.
- ED pharmacist now manages the stock level of PEF meters which is 'topped up' three times a week.
- Stadiometers were ordered to allow accurate height measurement.
- ED advanced nurse practitioner (ANP) and consultant attended nursing/medical handovers to reiterate the importance of maintaining stock levels and carrying out PEF tests with patients.
- The quarterly respiratory study day included education on asthma severity assessment for all staff.
- Educational posters have been placed in the ED.



Information provided by contributors from Manchester Royal Infirmary.

Respiratory specialist review

81%



of patients were reviewed by a respiratory specialist during their admission

Key standards

> **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.[7]

Audit results – respiratory specialist review

> Patients were judged to have had a respiratory specialist review if they were seen by any member of the respiratory multidisciplinary team (MDT) with training and skills in care of patients with asthma. **81.1%** of patients were **reviewed by a respiratory specialist** at some point during their admission.
> The **median time to respiratory specialist review** was **19.3 hours** (IQR 10.8–32.5 hours).
> **68.4%** of patients who received a respiratory specialist review on a weekday were **reviewed within 24 hours** of arrival at hospital.
> **56.0%** of patients who received a respiratory specialist review during a weekend were **reviewed within 24 hours** of arrival at hospital.

National QI priority: Ensure 90% of patients receive a respiratory specialist review during hospital admission. **(NICE 2013 QS25 [QS9])**

Timely access to / review by a respiratory specialist is the **patient priority for the adult asthma clinical audit**, as chosen by the NACAP patient panel. For more information on how this priority was selected, please visit: **www.rcplondon.ac.uk/nacap**.

Rationale

The audit data highlights that patients in receipt of a respiratory specialist review were more likely to receive an asthma care bundle and the associated elements of good practice care on discharge, as well as more likely to have their tobacco dependency addressed if a current smoker. Therefore, an ambitious 90% QI target has been set for this priority.

Tips to achieve this priority

- Work with the admitting medical teams to put a simple system in place whereby the respiratory team can be notified of new patients at the point of admission.
- Work with the local IT department to set up an alert system to support identification of relevant patients for review.
- Undertake a respiratory round of the admitting ward(s) and the emergency department each morning.

Oxygen prescription and administration

Key standards

- **BTS 2017 [Guideline for oxygen use in healthcare and emergency settings]:** Every healthcare facility should have a standard oxygen prescription document or, preferably, a designated oxygen section on all drug-prescribing cards or guided prescription of oxygen in electronic prescribing systems.[8]
- **BTS 2017 [Guideline for oxygen use in healthcare and emergency settings]:** A prescription for oxygen should always be provided, except in sudden illness when it must be started immediately and documented retrospectively.[8]

Audit results – oxygen prescription and administration

- Oxygen should be prescribed to ensure patients are managed safely. However, the audit data shows that:
  - **16.5%** of patients **were administered oxygen without a prescription**
  - **22.5%** of patients were **both prescribed and administered oxygen**
  - **18.1%** of patients were **prescribed but not administered oxygen**
  - **42.9%** of patients were **not prescribed or administered oxygen**

Respiratory teams should continue to advocate within their organisations for oxygen to be treated like any other medication and an incident form raised where oxygen is administered without a prescription except in an emergency.

Systemic steroids

Key standards

- **BTS/SIGN 2019 [2.7.1, 9.3.3]**: Give steroids in adequate doses to all patients with an acute asthma attack.[2]
- **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.[7]

Key standards – β_2 agonists

- **BTS/SIGN 2019 [2.7.1, 9.3.2]**: Use high-dose inhaled β_2 agonists as first-line agents in patients with acute asthma and administer as early as possible. Reserve intravenous β_2 agonists for those patients in whom inhaled therapy cannot be used reliably.[2]

Audit results – systemic steroids

- **87.4%** of patients were **administered systemic steroids** following arrival at hospital.
- **30.6%** of all patients who received systemic steroids as an inpatient received these **within 1 hour** of arrival at hospital.
- **65.8%** of all patients who received systemic steroids as an inpatient received these **within 4 hours** of arrival at hospital.
- There did not appear to be an association between receiving systemic steroids within 1 hour of admission to hospital and length of stay (OR = 0.99, 95% CI 0.93 to 1.06).**

Audit results – β_2 agonists

- **91.2%** of patients were **administered β_2 agonists** (inhaled or intravenous (IV)) following arrival at hospital.
- **40.9%** of all patients who received β_2 agonists (inhaled or intravenous (IV)) as an inpatient received these **within 1 hour** of arrival at hospital.
- **78.4%** of all patients who received β_2 agonists (inhaled or IV) as an inpatient received these **within 4 hours** of arrival at hospital.
- Although the administration of β_2 agonists relieves asthma symptoms, there did not appear to be an association between receiving β_2 agonists within 1 hour of admission to hospital and length of stay (OR = 1.00, 95% CI 0.95 to 1.07).

Caveats to systemic steroids and β_2 agonists audit data

- The audit dataset does not record pre-hospital care, so it is possible that some patients received their first dose of systemic steroids and β_2 agonists in primary care or in the ambulance. Data on time of administration of systemic steroids and β_2 agonists should be interpreted with this caveat.
- Early administration of systemic steroids is associated with better outcomes.[9] It is our intention to add a question to a revised adult asthma audit dataset on pre-hospital care. This will allow us to better understand whether patients are receiving timely emergency care.
- The analysis has not been adjusted for confounders such as age, asthma severity or comorbidities, which could affect both time to receipt of systemic steroids or β_2 agonists and length of stay.

** A Cochrane Review has shown that use of corticosteroids within 1 hour of presentation to an emergency department significantly reduces the need for hospital admission in patients with acute asthma. Benefits appear to be greatest in patients with more severe asthma, and those not currently receiving steroids. (Rowe BH, Spooner C, Ducharme F, Bretzlaff J, Bota G. Early emergency department treatment of acute asthma with systemic corticosteroids. *Cochrane Database of Syst Rev* 2001, Issue 1. Art. No.: CD002178. DOI: 10.1002/14651858.CD002178)

QI priority: Ensure 95% of patients who have not been administered systemic steroids as part of pre-hospital care are administered this treatment within 1 hour of arrival at hospital. (**NICE 2013 QS25 [QS8]**)

Rationale

Early administration of systemic steroids for asthma attacks is associated with better patient outcomes.[9] The audit data suggests that administration of systemic steroids within 4 hours of arrival at hospital is associated with reduced length of stay. Therefore, a 95% QI target has been set, taking into account exceptional cases where systemic steroids cannot be administered.

Tips to achieve this priority

- Incorporate a clear record of any pre-hospital systemic steroid treatment into the ambulance handover or pre-admission triage to avoid delay in treatment with steroids or duplication of treatment on arrival at hospital.
- Ensure that all emergency department staff are aware of the importance of steroid administration within 1 hour.

Case study: Lister Hospital (East and North Hertfordshire NHS Trust)

Systemic steroids administered within 1 hour

This team has achieved timely review and treatment with steroids, within the first hour, for patients with an asthma attack.

To achieve this, the Respiratory Clinical Nurse Specialist Team (on shift 8:30am – 4pm, 7 days a week) carry a bleep and mobile. Once a referral is received, they review the patient at the bedside and offer specialist advice and treatment.

How this has been achieved

The Respiratory Clinical Nurse Specialist Team is part of the Acute Chest Team. This team is available to support the emergency department and acute assessment unit with patients attending with respiratory problems, including asthma. They ensure timely review and appropriate treatment with escalation to a respiratory consultant should the need arise. They use a medical model to assess the patient in order to provide the correct treatment. They communicate with the acute medical teams to ensure timely prescriptions of systemic steroids. They facilitate admission prevention, if safe to do so, for patients, or if patients are being admitted, they ensure follow up with education regarding disease, health education / lifestyle, treatment choices and prevention of exacerbation.

The team have worked hard to ensure that they communicate effectively with the acute physicians and other nurses to enable partnership working to provide gold standard care. They use audit tools to assure the quality of the care they deliver.

The tools which the team have used when reviewing patients at the bedside can be found at **www.rcplondon.ac.uk/adult-asthma-2019-20**.

Information provided by contributors from Lister Hospital

Section 3:
Good practice care before discharge from hospital

To see the data analysis in full for patients admitted to hospital who were discharged between 1 April 2019 and 31 March 2020, please access the data analysis and methodology report available at: ***www.rcplondon.ac.uk/adult-asthma-2019-20.***

Back to contents

38%

of patients admitted received six elements of good practice care set out in the British Thoracic Society asthma care bundle before discharge[††]

Elements of good practice care on discharge

Key standards

- **BTS/SIGN 2019 [5.2.2]**: A hospital admission represents a window of opportunity to review self-management skills. No patient should leave hospital without a written personalised asthma action plan.[2]
- **BTS/SIGN 2019 [5.3.2]**: Prior to discharge, inpatients should receive written personalised asthma action plans, given by healthcare professionals with expertise in providing asthma education.[2]
- **BTS/SIGN 2019 [9.6.2]**: Prior to discharge, trained staff should give asthma education. This should include education on inhaler technique and PEF record keeping, with a written PEF and symptom-based personalised asthma action plan being provided allowing the patient to adjust their therapy within recommendations. These measures have been shown to reduce morbidity after the asthma attack and reduce relapse rates.[2]
- **BTS/SIGN 2019 [9.6.3]**: A careful history should elicit the reasons for the asthma attack and explore possible actions the patient should take to prevent future emergency presentations.[2] Medication should be altered depending upon the assessment and the patient provided with an asthma action plan aimed at preventing relapse, optimising treatment and preventing delay in seeking assistance in the future.[2]
- **BTS/SIGN 2019 [9.6.3]**: Prior to discharge, follow up should be arranged with the patient's general practitioner or asthma nurse within 2 working days, and with a hospital specialist asthma nurse or respiratory physician at about 1 month after admission.[2]
- **NICE 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.[7]
- **NICE 2018 QS25 [QS5]**: People with suspected severe asthma are referred to a specialist multidisciplinary severe asthma service.[7]

[††] The six elements of good practice care before discharge included in this analysis were: inhaler technique check, maintenance medication reviewed, adherence discussed, personalised asthma action plan issued/reviewed, tobacco dependency addressed (if a current smoker) and follow up (either community follow up requested within 2 working days and/or specialist review requested within 4 weeks).

Audit results – elements of good practice care on discharge:

Elements of good practice care

- **87.7%** of all patients received **at least one of the elements** of good practice care. This figure includes the elements listed below, in addition to 'triggers discussed' as an option. The figure excludes current smokers who only had tobacco dependency addressed.
- **37.5%** of patients received **all six elements of good practice care**. The six elements were:
  - inhaler technique checked
  - maintenance medication reviewed
  - adherence discussed
  - personalised asthma action plan issued/reviewed
  - tobacco dependency addressed (if a current smoker)
  - follow up (patient provided either: community follow up requested within 2 working days and/or specialist review requested within 4 weeks).
- The **least frequently provided** elements of good practice care were (values in parentheses represent the proportion of patients in receipt of an asthma care bundle who received this bundle element*):*
  - community follow up requested within 2 working days (**40.5%**)
  - issue/review of a personalised asthma action plan (PAAP) (**47.4%)**.
- The **most frequently provided** elements of good practice care were (values in parentheses represent the proportion of patients in receipt of an asthma care bundle who received this bundle element):
  - maintenance medication reviewed (**78.7%**)
  - tobacco dependency addressed (if current smoker) (**67.7%**) (denominator of current smokers = 4,394)
  - inhaler technique checked (64.8%).

Asthma care bundle[‡‡]

- **57.7%** of patients **received an asthma care bundle.**

Relationship between asthma care bundle and elements of good practice care receive

- Those who received an asthma care bundle were over 20 times more likely to receive all six elements of good practice compared with those who did not receive a asthma care bundle (OR = 22.76, 95% CI 20.67 to 25.10).

[‡‡] An asthma care bundle is a short list of things that should be done for every patient that has been admitted to hospital with an asthma attack. It may be paper or electronic depending on the care setting and is there to act as a reminder to busy staff of the things to focus on. An asthma care bundle can be incompletely applied - in which case all six elements may not be delivered and is therefore a prompt to improve care standards. The audit has measured the delivery of the six separate elements of good practice as well as whether or not they were included in an asthma care bundle.

Inhaled steroids and oral steroids

Key standards

- **BTS/SIGN 2019 [Management of acute asthma in adults in hospital (Annex 5)]**: When discharged from hospital, patients should have treatment with oral steroids (prednisolone 40–50 mg until recovery – minimum 5 days) and inhaled steroids in addition to bronchodilators.[2]

Audit results – inhaled steroids and oral steroids

- **89.6%** of patients were prescribed **inhaled steroids at discharge**
- **91.1%** of patients were prescribed at least **5 days of oral steroids for treatment** of their asthma attack
- **32.5%** of patients had been prescribed **more than two courses of oral steroids in the past 12 months**.

Referral for hospital assessment

Key standards

- **BTS/SIGN 2019 [Management of acute asthma in adults in hospital (Annex 5)]**: When discharged from hospital, patients should have a follow-up appointment in a respiratory clinic within 4 weeks.[2]
- **NRAD 2014 [Organisation of NHS services – recommendation 3]**: Secondary care follow up should be arranged after every hospital admission for asthma […].[4]

Audit results – referral for hospital assessment

- **55.1%** of patients were **referred for hospital assessment / follow up.** A further **15.4%** of patients were **already being seen** in a secondary care clinic.

Oral steroids history and referral for hospital assessment:[§§]

of patients prescribed more than two courses of oral steroids in the previous 12 months were not referred for hospital assessment / follow up

Key standards

- **NRAD 2014 [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 BTS stepwise treatment 4 or 5 to achieve control.[4]

Audit results – oral steroids history and referral for hospital assessment

- Where patients were **prescribed more than two courses of oral steroids in the previous 12 months**, **55.7%** were referred for hospital assessment / follow up and 30.9% of patients were recorded as already being seen in secondary care clinic.
- 10.6% of patients prescribed more than two courses of oral steroids in the past 12 months were not referred for hospital assessment / follow up.

[§§] 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.
This is a key recommendation in Royal College of Physicians. *Why asthma still kills: The National Review of Asthma Deaths (NRAD) Confidential Enquiry report*. London: RCP, 2014. **www.rcplondon.ac.uk/projects/outputs/why-asthma-still-kills**.[4]

Tobacco dependency

68%

of current smokers had their tobacco dependency addressed***

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.[2]
- **NICE 2013 QS43 [QS1]:** People are asked if they smoke by their healthcare practitioner, and those who smoke are offered advice on how to stop.[5]
- **NRAD 2014 [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.[4]

Audit results – smoking

- **22.7%** of patients admitted for asthma attacks were **recorded as current smokers**
- **23.6%** of patients admitted were ex-smokers and **44.5%** of patients had never smoked.
- **67.7%** of current smokers had their tobacco dependency addressed prior to discharge.

*** Addressing tobacco dependency includes identifying patients who smoke on admission and offering and/or prescribing smoking cessation advice and/or pharmacotherapy.

Section 4:
Proposed best practice tariff metrics

To see the data analysis in full for patients admitted to hospital who were discharged between 1 April 2019 and 31 March 2020, please access the data analysis and methodology report available at: ***www.rcplondon.ac.uk/adult-asthma-2019-20.***

Back to contents

The asthma best practice tariff (BPT) is a proposed England-only financial incentive to support trusts in resourcing teams to provide specified, high-value, elements of asthma care during hospital admission, in a manner similar to that achieved by the COPD BPT. The audit has measured performance against the metrics proposed.

A BPT is made up of two components:

- a base tariff – paid irrespective of whether the mandatory BPT metrics are met
- a conditional top up – payable if the mandatory metrics are met.

Achievement is measured at trust, not patient, level and in the case of the proposed asthma BPT a trust would need to ensure that at least 50% of cases included in the audit receive all mandatory metrics during their admission, to achieve the conditional top up payment. If this has been achieved, the conditional top up payment would be paid for every adult asthma admission. Likewise, if a provider has not met the requisite 50%, the conditional top up will not be received for any patient episode.

Financial incentives for promoting good patient care are being reviewed nationally. However, the metrics described below were selected after discussion between the NACAP team, Getting It Right First Time (GIRFT) and the BTS as aspects of care, which if implemented reliably, could improve outcomes for patients. We have therefore provided details of the metrics below to allow clinical teams to assess how they perform against the suggested standards.

The mandatory BPT metrics are proposed to be:

a) provision of respiratory review within 24 hours of arrival and
b) provision of the following elements of good practice asthma care before discharge:

- inhaler technique checked
- maintenance medication reviewed
- personal asthma action plan (PAAP) issued/reviewed
- tobacco dependency addressed (if current smoker).

We are aware that the BPTs have been suspended as a result of COVID-19 and all trusts moved on to block contracts. This information has therefore been given to provide hospitals with information on its content ahead of this system being reinstated.

Scottish hospitals and Welsh health boards would not receive BPT payments. Data for Scotland and Wales against these proposed BPT metrics are also included in the data analysis and methodology report so that these hospitals can see how they performed against the proposed England BPT metrics.

Audit results – best practice tariff

- **28.8%** of patients received **all mandatory BPT elements**
  - **52.4%** of patients received a **specialist respiratory review within 24 hours**
  - **64.8%** of patients had their **inhaler technique checked**
  - **78.7%** of patients had their **maintenance medication reviewed**
  - **47.4%** of patients had a **personalised asthma action plan (PAAP) issued/reviewed**
  - **67.7%** of patients had their **tobacco dependency addressed** (if current smoker)
- **18.5%** of hospitals **met all of the requirements to achieve the BPT**

The proposed adult asthma best practice tariff (BPT)

These metrics are:

- provision of respiratory review within 24 hours of arrival and
- provision of specific elements of good practice asthma care by discharge:
  - inhaler technique checked
  - maintenance medication reviewed
  - personal asthma action plan issued/reviewed
  - tobacco dependency addressed (if current smoker).

Audit results – best practice tariff

28.8% of patients received all mandatory BPT elements

52.4% of patients received a specialist respiratory review within 24 hours
64.8% of patients had their inhaler technique checked
78.7% of patients had their maintenance medication reviewed
47.4% of patients had a personalised asthma action plan issued/reviewed
67.7% of patients had their tobacco dependency addressed (if current smoker)

18.5%

of hospitals met all of the requirements to achieve the BPT

Case study: Addenbrooke's Hospital (Cambridge University Hospitals)

Proposed best practice tariff (BPT) requirements

- All patients admitted with an exacerbation of asthma are reviewed by a respiratory specialist within 24 hours of admission (respiratory consultant, respiratory specialty registrar (SpR), respiratory nurse specialist or respiratory specialist physiotherapist).
- All patients admitted to hospital with a diagnosis of an asthma attack have an asthma discharge bundle completed by the respiratory nurse specialist team as recommended by BTS/SIGN 2016.

Steps to achieving the proposed BPT criteria were:

- Electronic medical records allowed the team to identify emergency asthma admissions on a daily basis via the morning medicine report. This allowed them to prioritise tasks.
- A respiratory specialist (respiratory consultant, respiratory specialty registrar, respiratory nurse specialist or respiratory specialist physiotherapist) reviewed all patients admitted with an exacerbation of asthma within 24 hours of admission.
- Staff completed an asthma bundle on all patients admitted to hospital with a diagnosis of an asthma attack.
- In order to be able to capture all the data required for the NACAP adult asthma audit there was a smart phrase (blocks of text that can be copied and pasted into hospital electronic health records systems to automatically create discharge papers for common emergency department presentations) on the electronic medical records system (EPIC) for guidance in consultation when the patient is reviewed by a respiratory nurse specialist. This made the data input process more efficient and effective.
- The respiratory nurse specialist team ensured that patients were added to a database for ease of identifying patients to be included in the NACAP audit.
- The team allocated a respiratory administrator to input data to the NACAP audit.

Discharge bundle

On discharge, the team assessed:

a. the patient's inhaler technique and provide a web link which had information on all inhaler devices, including training videos demonstrating correct inhaler technique
b. whether the device/drug was appropriate for the patient
c. medication adherence
d. the patient's smoking status. If the patient was a current smoker the team ensured nicotine replacement therapy (NRT) patches were prescribed while they remained an inpatient and referred them to local smoking cessation services on discharge.

80% of patients included in the audit at Addenbrooke's Hospital received all mandatory elements of the BPT

The team also:

e. provided all patients with personalised asthma action plans. The team reviewed and amended existing management plans accordingly and provided new personalised asthma management plans for patients who had never had one previously.
f. advised all patients who have been admitted with an exacerbation of asthma to see their GP / practice nurse within 48 hours of discharge. They ensured this was documented on the discharge summary so GPs were aware of the need to review the patient post discharge.
g. requested clinic follow-up in the hospital's specialist asthma clinic 4–6 weeks post discharge.

Information provided by contributors from Addenbrooke's Hospital

Section 5:
The first hour of care

To see the data analysis in full for patients admitted to hospital who were discharged between 1 April 2019 and 31 March 2020, please access the data analysis and methodology report available at: ***www.rcplondon.ac.uk/adult-asthma-2019-20.***

Back to contents

This section contains information collected in the adult asthma audit that describes the provision of care in the first hour after patients arrive in hospital for treatment of an asthma attack. This section is included to emphasise the importance of patients with asthma attacks being identified and treated as soon as possible in their admission.

In the first hour of care for adult patients admitted to hospital with an acute asthma exacerbation, the aim is to achieve:

- peak expiratory flow (PEF) measurement to assess asthma attack severity
- administration of bronchodilators (β_2 agonists)
- administration of systemic corticosteroids
- assessment of oxygenation and prescription of an oxygen target saturation range of 94–98%

Once a patient is admitted to hospital, clinicians must rapidly assess the severity of the asthma attack. One element of this assessment is measurement of PEF. At the same time the clinician must aim to stabilise the patient while relieving distressing symptoms. This is achieved through timely administration of systemic steroids, β_2 agonists and oxygen titrated to the patient's saturations. A Cochrane Review[9] has shown that use of corticosteroids within 1 hour of presentation to an ED significantly reduces the need for hospital admission in patients with acute asthma. Benefits appear to be greatest in patients with more severe asthma, and those not currently receiving steroids.[†††] The first hour of care after hospital admission is therefore critical in achieving the best outcome for patients.

Audit results – first hour of care

- **19.0%** of patients had their **PEF taken within 1 hour of arrival at hospital**.
- **37.3%** of patients were **given β_2 agonists within 1 hour**.
- **26.7%** of patients were **given systemic steroids within 1 hour**.

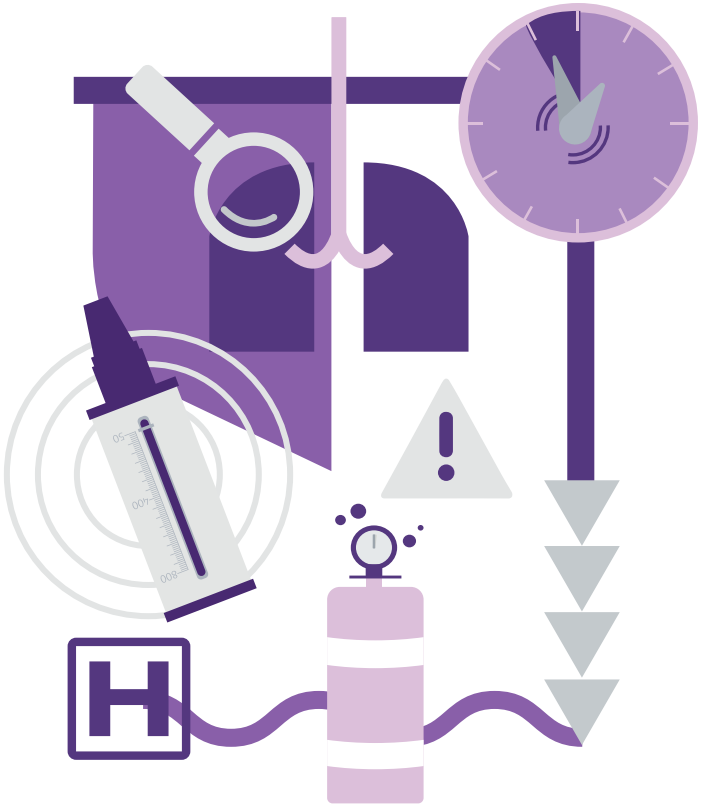
This information is repeated from section 2 of this report for ease of reference.

Audit results – oxygen prescription and administration

- **18.1%** of patients were **prescribed but not administered oxygen**.
- **16.5%** of patients were **administered oxygen with no prescription**.
- **22.5%** of patients were **both prescribed and administered oxygen**.
- **42.9%** of patients were **not prescribed or administered oxygen.**

This information is repeated from section 2 of this report for ease of reference.

[†††] Rowe BH, Spooner C, Ducharme F, Bretzlaff J, Bota G. Early emergency department treatment of acute asthma with systemic corticosteroids. *Cochrane Database of Systematic Reviews* 2001, Issue 1. Art. No.: CD002178. DOI: 10.1002/14651858.CD002178



The first hour of care

For adult patients admitted to hospital with an acute asthma exacerbation, the aim is to achieve:

- assessment of asthma attack severity within 1 hour (peak expiratory flow (PEF) taken)
- administration of bronchodilators (β2 agonists) within 1 hour
- administration of systemic corticosteroids within 1 hour
- assessment of oxygenation and prescription of an oxygen target saturation range of 94–98 % within 1 hour.

Audit results – The first hour of care

19.0%
of patients had their peak flow taken within 1 hour of arrival at hospital

37.3%
of patients were given β2 agonists within 1 hour

26.7%
of patients were given systemic steroids within 1 hour

Audit results – Oxygen prescription and administration

18.1%
of patients were only prescribed oxygen

16.5%
of patients were administered oxygen with no prescription

22.5%
of patients were both prescribed and administered oxygen

42.9%
of patients were not prescribed or administered oxygen

Section 6:
Summary information on patients who died after arrival at hospital

To see the data analysis in full for patients admitted to hospital who were discharged between 1 April 2019 and 31 March 2020, please access the data analysis and methodology report available at: ***www.rcplondon.ac.uk/adult-asthma-2019-20.***

Back to contents

Despite advances in therapeutics and pathways of care, patients with asthma still die. The RCP's 2014 report *Why asthma still kills* highlighted opportunities by which death might have been avoided with improvements in the standards of care which patients received.[4] To ensure that the focus remains on avoiding death from asthma, this section has been added to the audit report to allow audit participants to better understand the demographics and care received by patients who died during the data collection period of the audit to support a clear focus on quality improvement priorities.

Audit results – patients who died after being admitted to hospital

Please note that as there were a small number of deaths (N=47) the confidence intervals for the odds ratio are wide, and the analysis has not been adjusted for variables such as age or asthma severity.

- The **number** of patients that died during admission was **47 (0.2%).**
- The **median age** of patients that died in hospital was **82** (13 (27.7%) <70 years and 34 (72.3%) ≥70 years).
- Of the patients that died during admission **13 (27.7%)** were **male** and **34 (72.3%)** were **female**.
- **6 (0.1%)** of the patients who died had a **moderate severity asthma exacerbation** and **41 (0.3%)** had **severe and life-threatening asthma attack.**
- The **median time from arrival to inpatient death** was **138 hours** (IQR (78–310)).

Respiratory specialist review

- The **median time to specialist review** for patients who died was **20.9 hours** for those who were seen by a specialist.
- There was a non-statistically significant trend towards a reduced risk of dying for patients who received a specialist review vs those who did not (OR = 0.55 (95% CI 0.30 to 1.06)).
- There is no evidence to support a difference in the likelihood of dying as an inpatient if patients received a respiratory specialist review over 24 hours from arrival at hospital when compared with patients who received a respiratory specialist review within 24 hours of arrival (OR = 1.18, 95% CI 0.57 to 2.36). Please note that as there were a small number of deaths (N=47) the confidence intervals for the odds ratio are wide, and the analysis has not been adjusted for variables such as age or asthma severity.

Appendix A: References

1 Asthma UK. Asthma facts and statistics. **www.asthma.org.uk/about/media/facts-and-statistics** [Accessed 01 August 2020].

2 British Thoracic Society (BTS) / Scottish Intercollegiate Guidelines Network (SIGN). *SIGN 153: British guideline on the management of asthma – A national clinical guideline.* [Updated July 2019]. **www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/** [Accessed 03 August 2020].

3 Gibson PG *et al*. Self-management education and regular practitioner review for adults with asthma. *Cochrane Database Syst Rev* 2003;(1):CD001117.

4 Royal College of Physicians. *Why asthma still kills: the National Review of Asthma Deaths (NRAD) Confidential Enquiry report*. London: RCP, 2014. **www.rcplondon.ac.uk/projects/outputs/why-asthma-still-kills** [Accessed 03 August 2020].

5 National Institute for Health and Care Excellence. *Smoking: supporting people to stop. NICE Quality standard 43 (QS43).* London: NICE, 2013. **www.nice.org.uk/guidance/qs43** [Accessed 03 August 2020].

6 Smokefree. NHS stop smoking medicines. **www.nhs.uk/smokefree/help-and-advice/prescription-medicines** [Accessed 03 August 2020].

7 National Institute for Health and Care Excellence. *Asthma*. *NICE Quality standard 25 (QS25)*. London: NICE, 2018. **www.nice.org.uk/guidance/qs25** [Accessed 03 August 2020].

8 O'Driscoll BR, Howard LS, Earis J, Mak V. BTS guideline for oxygen use in adults in healthcare and emergency settings. *Thorax* 2017;72:i1–i90.

9 Rowe BH, Spooner C, Ducharme F, Bretzlaff J, Bota G. Early emergency department treatment of acute asthma with systemic corticosteroids. *Cochrane Database Syst Rev* 2001;(1):CD002178.

National Asthma and COPD Audit Programme (NACAP)

Royal College of Physicians
11 St Andrews Place
Regent's Park
London NW1 4LE

Tel: +44 (0)20 3075 1526
Email: asthma@rcplondon.ac.uk

www.rcplondon.ac.uk/nacap

@NACAPaudit
#AdultAsthmaAudit
#AsthmaAuditQI

Royal College of Physicians | NACAP