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Article

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Assessment of Asthma Management in Adult Patients: A Retrospective Case Note Review

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ABSTRACT

This study aimed to assess asthma management in a sample of adult patients in a general practice. A retrospective case-note review was conducted, involving 27 asthma patients in a general practice in England. The Asthma Quality Improvement tool informed the development of the data collection tool. The data were analysed statistically by the researcher using frequencies testing, using descriptive statistics. Twenty-one participants out of 27 were reviewed in the general practice in the last 12-months by their healthcare practitioner. All the components of an asthma review were assessed and recorded except the inhaler-technique for 11 participants and 66.7% were classed as having poorly-controlled asthma symptoms. Although the small sample size affected the generalisability of the findings, reviewing the medical records of each participant allowed the researcher to highlight issues with asthma management in the sample. This study found that asthma care in the participants requires improvement and highlighted areas that could be targeted to enhance asthma care. Asthma care could be enhanced by focusing on increasing asthma patients' engagement with their annual asthma reviews, enhancing the provision of the asthma action plan and following a consistent approach for inhaler-technique check and recording of asthma review components. Finally, conducting multiple checks of asthma patients' medical records might help to identify patients who need a review and support them to enhance their management of their asthma.

INTRODUCTION

Asthma is a long-term condition (LTC), with an estimated 235 million people currently living with asthma globally (World Health Organisation, 2017). Patients with poorly-controlled asthma symptoms are at higher risk of an asthma attack that may lead to hospital admission, which could be prevented if asthma patients were appropriately managed (Royal College of Physicians, 2015; Department of Health 2011). In England, asthma patients see their general practitioner, practice nurse, or practice pharmacist for the management of their asthma (Asthma UK, 2019a). This may include an annual asthma review (AAR), which involves a 20–30-minute appointment to assess asthma control, lung function, asthma attacks, inhaler-technique, and medication use and the development of a personalised asthma action plan (AAP) (British Thoracic Society and Scottish Intercollegiate Guidelines Network, 2019; Global Initiative for asthma, 2019; Primary Care Respiratory Society UK, 2008). In addition, the general practitioner (GP) may refer patients to a respiratory specialist in the hospital if needed (Asthma UK, 2019a).

Issues related to asthma care in patients that are related to asthma management and patients' behaviour were identified as preventable causes of asthma deaths (Royal College of Physicians, 2015). There is a need to improve the quality of asthma care by addressing the current issues in asthma

management with an emphasis on enhancing patient engagement with their asthma services and self-management plan (Royal College of Physicians, 2015; Craske et al., 2018; Global Initiative for asthma, 2019; Barbanel et al., 2003; British Thoracic Society and Scottish Intercollegiate Guidelines Network, 2019; Thomas, 2015). As 85% of asthma patients are managed in primary care (Asthma UK, 2017), this study was conducted to assess asthma management in a sample of adult asthma patients in a GP practice in England.

MATERIALS AND METHODS

An observational study that involved a retrospective case-note review (RCR) was conducted. Medical records (MRs) of 27 adult asthma patients held in the general practice were reviewed by one researcher according to a published RCR process (Sarkar and Seshadri, 2014). Training was provided to the researcher on the EMIS Web (clinical recording system used in the GP practice (Emis health, 2019)) and on data extraction by conducting a pilot. Reporting was structured by the Strengthen the Reporting of Observational Studies in Epidemiology (STROBE) checklist for observational studies to provide a rigorous structure of the RCR (Von Elm et al., 2007). Ethical approval (19/IEC08/0025) for this study was granted by the Health Research Authority (HRA) in England and Research Ethics Committee (REC).

Participants and recruitment

MRs in the GP practice were searched for patients whose MRs were coded with any Read code (clinical terms, which are used to record patient findings (NHS Digital, 2018)) for asthma, prescribed asthma medication in the last 12-months and aged 17-65 year old. Adult patients were identified as patients over 17 years of age (National Institute for Health and Care Excellence, 2017). Older adults over 65 years of age (NHS, 2021) were excluded because they usually have multiple comorbidities and use many medications that may complicate their asthma management (Tzortzaki et al., 2011; Gibson et al., 2010; Global Initiative for asthma, 2019), which could affect the quality of data collected. All potential participants (537) were invited to participate to reduce selection bias (Figure 1).

Convenience sampling strategy was followed because of the limited number of patients who consented to participate, therefore MRs were reviewed for 27 adult asthma patients only who agreed to participate by a written consent, although the researcher strived to recruit more participants. Convenience sampling allowed the researcher to conduct the study within the limited time and budget (Lavrakas, 2008).

Data collection

Twenty-seven MRs were reviewed by the researcher. A data collection tool was developed by the researcher, reviewed by the research team and piloted before the data collection commenced. The development of the data collection tool was informed by the Asthma Quality Improvement tool (PRIMIS, 2018). Extraction of the data by one researcher using predefined variables with accordance to a validated tool enhanced the reliability and validity of the data (Sarkar and Seshadri, 2014; Allison et al., 2000; Vassar and Holzmann, 2013). The data collection tool (Supp. Table 1) was designed to capture outcomes including patients demographics, medical history (British Thoracic Society and Scottish Intercollegiate Guidelines Network, 2019), presence of comorbidity, the Royal College of Physicians (RCP) '3 questions': (Q1 Have you had difficulty sleeping because of your asthma symptoms?; Q2 Have you had your usual asthma symptoms during the day?; Q3 Has your asthma interfered with your usual activities?) (NICE), short-acting beta-2 agonist (SABA) inhaler use, Inhaled-Corticosteroid (ICS) use, secondary-care engagement, and asthma management.

Data-analysis

The researcher entered the collected data and field-notes into the IBM Statistical Package for the Social Sciences (SPSS) 24 data sheet. The data were analysed statistically by the researcher using frequencies testing, using SPSS descriptive statistics tool.

Pilot

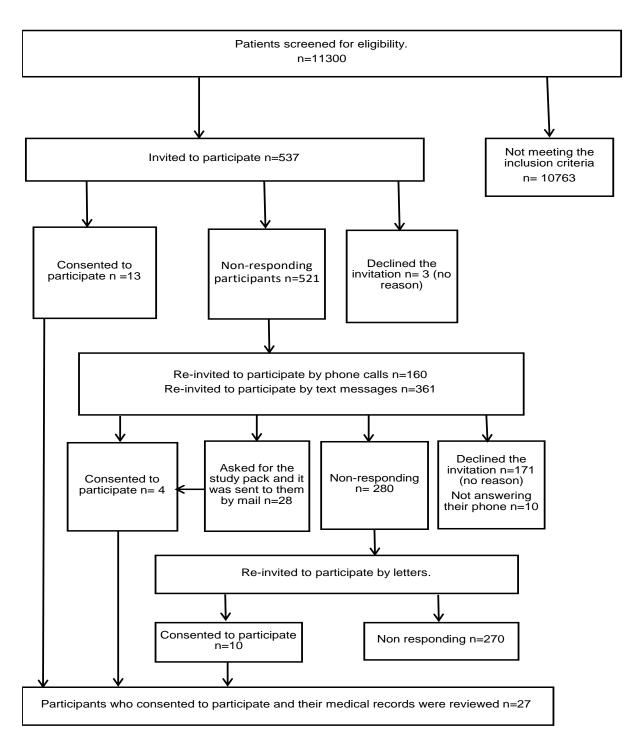The first 3 patients' case-notes reviewed were piloted to determine if the methods of data collection yielded appropriate data. The data were collected twice for the pilot; by the researcher and a practice pharmacist in the GP practice, then data collected were compared to determine whether any amendments were required based on the findings from the pilot. The BTS/SIGN and comorbid allergic-rhinitis variable descriptions

on the data collection sheet were amended to ensure consistency.

Figure 1. Flow chart of participants' recruitment for the study

RESULTS AND DISCUSSION

The mean age of the participants was 49.7 (SD=11.23) years and 55.6% were female. All the participants were coded with asthma except 2 patients, who were classified as possible asthma because they were using SABA-inhalers regularly (see Table 1).

Medical History
The participants' prescribing data were used during the last 12-months. Consequently, the BTS/SIGN asthma treatment-step was estimated for each patient based on the inhaler prescribed and its daily dose using the BTS/SIGN-step diagram (British Thoracic Society and Scottish Intercollegiate Guidelines

Network, 2019). Additionally, associated features, RCP score and secondary care engagement were extracted from the MRs (Table 2).

Table 1. Asthma prevalence in the GP practice and Demographic characteristics of participants in the study

Parameter	Number
Practice population	11,303
Patients aged 17-65	7257
Patients aged 17-65 with asthma ever recorded	815 (11.23%)
Patients aged 17-65 with active asthma	537 (7.39%)
Patients with possible asthma	125 (1.72%)
Participants	27
Age (mean (SD), range)	49.7 (11.2) y, 25-65 y
Gender n, (%)	
Male	12 (44.4%)
Female	15 (55.6%
Asthma diagnosis n, (%)	
Patients coded with asthma	25 (92.6%)
Patients with possible asthma	2 (7.4%)

As shown in **Table 2**, three participants had comorbid Chronic Obstructive Pulmonary Disease (COPD), which made it difficult to determine the treatment-step. Most participants had depression (59.3%) and were classified as obese (55.6%). Almost three-quarters of participants (74.1%) had their asthma control reviewed during the last 12-months (**Table 2**). Participants whose RCP score was one were considered to have poorly-controlled asthma if they were prescribed more than 4 SABA-inhalers, or had 1 or more asthma attacks within the last 12-months. Five other participants were not asked any of the RCPs' questions during their AAR; therefore, it was impossible to estimate their asthma control level. Overall, 4/27 participants had controlled asthma, while 18/27 had poorly-controlled asthma.

Non-adherence to asthma medications among the study participants was evident. Four (14.8%) of the participants were prescribed over 12 SABA-inhalers in 12-months despite being reviewed in the last 12-months. Only 3 (11.1%) participants were prescribed 12 or more ICS-inhalers, whereas 21 (89.9%) participants were prescribed less than 12 ICS-inhalers

during the last 12-months. Among these 21 participants who were considered underusing their preventer inhaler, 9 were prescribed 1-4 ICS-inhalers during the last 12-months. The analysis showed that 80% of the participants were reviewed in the last 12-months while the other 20% were not. Of these, 3 participants were contacted on more than one occasion and were reminded of their appointments, but they did not attend their AAR. Moreover, 3 participants were not prescribed any ICS-inhalers during the last 12-months, although they were referred to a specialist to confirm or check their asthma diagnosis; but 2 of them missed their appointments and the third one was referred recently. None of the participants was prescribed a long-acting beta-agonist (LABA) without ICS.

The results showed that no participant was admitted to the hospital due to their asthma in 12-moths. Although 23(85.2%) participants were not seen in Accident and Emergency (A&E), they were seen in the GP practice for urgent appointments for their asthma. Fifteen (55.6%) participants were referred to secondary care; 6 referrals for management advice, 4 for diagnosis, one for spirometry measurement and one for regular care (for a patient with asthma, COPD and mobility problem). Only one participant received more than 6 oral-corticosteroids (CS) prescriptions in the last 12-months and was referred to a specialist for follow-up. Nine participants were prescribed less than 6 oral-CS in the last 12-months. Of these, 8 were referred to a specialist, while one of them was neither referred to a specialist nor treated with BTS/SIGN treatment-step 4 or 5. Although 63% of the participants were not prescribed any oral-CS in the last 12-months, some had poorly-controlled asthma.

Asthma management
Six (22.2%) participants were not reviewed within the last 12-months (Table 3); 5 of them were contacted on more than one occasion regarding their AAR but they had not responded or attended. Amongst these 6 participants, 5 had comorbid depression and/or anxiety, one had not attended AAR appointments for 4 years and another one had not attended either AAR or general health check appointments. The smoking-status was recorded in the MRs for all the participants. Only 3 of the current smokers were referred to a smoking cessation service in the last 12-months.

Table 2. Medical history for participants in the study.

Parameter	Number of participants (n, %)
BTS/SIGN treatment-step	
SABA	3 (11.1%)
Step 1	10 (37.0%)
Step 2	2 (7.4%)
Step 3	6 (22.2%)
Step 4	1 (3.7%)
Step 5	2 (7.4%)
Uncategorised	3 (11.1%)
Associated features	
COPD	5 ,18.5 %
Obesity	15, 55.6%
Anxiety	7, 25.9%
Depression	16, 59.3%
Allergic rhinitis	5, 18.5%
RCP-questions	
Asked all the 3 questions	20, 74.1%
Asked one or 2 questions	2, 7.4%
Not asked any	5, 18.5%
RCP-score	
No to all of the questions (RCP=0)	2, 7.4%%
Yes to one question (RCP=1)	5, 18.5%
Yes to 2 or 3 questions (RCP=2 or 3)	15, 55.6%
Not recorded	5, 18.5%
Asthma control	
Controlled asthma	4, 14.8%
Poorly-controlled asthma	18, 66.7%
Cannot be estimated	5, 18.5%
Medication use – SABA	
Over 12 inhalers	4, 14.8%
9-12 inhalers	3, 11.1%
5-8 inhalers	2, 7.4%
1-4 inhalers	12, 44.4%
None	6, 22.2%
Medication use - ICS	
Over 12 inhalers	*3, 11.1%*
9-12 inhalers	5, 18.5 %
5-8 inhalers	7, 25.9%
1-4 inhalers	9, 33.3%
None	3, 11.1%
Secondary care engagement	
Hospital admission: Admitted to hospital related to asthma during the last 12-months	0
A&E attendance related to asthma	
Seen in A&E related to asthma	4, 14.8%
Not seen in A&E related to asthma	23, 85.2%

Referral to secondary care	
Referred to specialist	15, 55.6%
Not referred to a specialist	12, 44.4%
Frequent oral-steroid use	
6 or more prescriptions	1, 3.7%
Less than 6	9, 33.3%
None	17, 63.0%

BTS: British Thoracic Society, SIGN: Scottish Intercollegiate Guideline Network, COPD: Chronic Obstructive Pulmonary Disease, RCP: Royal College of Physicians, SABA: Short Acting Beta Agonist, ICS: Inhaled Corticosteroid, A&E: Accident and Emergency.

Table 3. Asthma management

Asthma management	Number of participants (n, %)
Annual Asthma Review	
Reviewed in the last 12-months	21, 77.8%
Not reviewed in the last 12-months	6, 22.2%
Smoking-status	
Non-smoker	20, 74.1%
Current smoker	7, 25.9%
Asthma attack	
Had an asthma attack(s) during the last 12-months	7, 25.9%
None	20, 74.1%
Asthma self-management plan	
Recorded or updated during the last 12-months	12, 44.4%
Not recorded or updated during the last 12-months	15, 55.6%
Inhaler-technique	
Inhaler-technique reviewed	10, 37%
Inhaler-technique not reviewed	17, 63%

Participants who had been prescribed an oral-CS within the last 12-months were counted as patients who had an asthma attack (PRIMIS, 2018). Seven participants had an asthma attack in the last 12-months and were referred to secondary-care. Of these, five had poorly-controlled asthma and/or prescribed more SABA-inhalers than expected. Although the other 2 participants had controlled asthma and had not prescribed more SABA-inhalers than expected, they had other risk factors that resulted in an asthma attack, including obesity, female gender and/or depression.

A problem with the provision and recording of AAP was evident. The AAP was not recorded for 15 (55.6%) participants, 6 of these were followed up by secondary care where their asthma AAP could have been updated and recorded. Additionally, 4 out of those 15 had not attended their AAR within the last 12-months, therefore, their AAP was not updated or recorded. Additionally, the AAP for 5 of the participants had not been recorded within the last 12-months, although they had attended their AAR.

A lack of standardised documentation of inhaler-technique assessment was evident. Inhaler-technique was checked for 10 participants only and recorded as good, moderate or poor. The inhaler-technique was not checked or recorded for the other 17 participants. Of these, 11 participants attended their AAR and were reviewed but their inhaler-technique was not checked or recorded.

Participants who needed a review
The findings highlighted some reasons that asthma patients might need a review (see Table 4).

A list of these patients was shared with the practice pharmacist in the general practice.

Discussion

The study was conducted in 5% of the adult asthma patients in the GP practice. Therefore, the findings of this phase cannot be generalised to asthma patients. However, the findings were utilised to identify some issues in the provision and/or recording of elements of the AAR that will be discussed in this section.

The prevalence of asthma in adult patients in the GP practice was 11.23%, which is comparable with prevalence in England (Asthma UK's press office). The findings showed that 77.8% participants were reviewed in the last 12-months regardless of the efforts to engage asthma patients with their AARs, they did not attend their AARs. Whereas the evidence showed that 30% of asthma patients do not attend their asthma reviews (van Baar et al., 2006; Mault et al., 2012). This difference can be related to the small sample number in this study.

Twenty participants (74.1%) were asked all 3-RCPs' questions and their answers were recorded. Another study in the UK showed that the RCPs' questions were recorded for 81% of asthma patients in the GP practice (Price et al., 2012). Although 66.7% of the participants in this study had poorly-controlled asthma, none of them had an asthma-related hospital admission in 12-months. One participant needed hospitalisation but refused, which is common among asthma patients (Asthma UK, 2019b). Although the referrals of participants to secondary care were in accordance with the current guidance (Steve Holmes, 2019; British Thoracic Society and Scottish Intercollegiate Guidelines Network, 2019; Global Initiative for asthma, 2019), referring 55.6% of the participants to secondary care highlighted the limited representativeness of the study sample.

The RCR identified factors that are associated with poor asthma management in the study sample. Moreover, it identified participants who needed a review because of having poor-asthma control, overusing their SABA-inhaler, underusing their preventer-inhaler or received a prescription for more than 6 oral-CS in the last 12-months. This highlighted the importance of regular quality checks of asthma patients' MRs to improve asthma management (PRIMIS, 2018). Overuse of the reliever inhaler and non-adherence to the preventer inhaler, were related to poor-asthma control and were highlighted as preventable causes for asthma deaths (Thomas, 2015; Royal College of Physicians, 2015). Asthma patients who were prescribed more than 6 SABA-inhalers within 6-months without any ICS are currently referred by community pharmacists to the general practice for a review (Pharmaceutical Services Negotiating Committee, 2019).

The participants' smoking-status was checked and recorded for all the participants within the last 12-months. However, not all the current smokers were given advice and/or referred to a smoking cessation programme during their AAR. The national standards for asthma management recommended checking and recording smoking-status for asthma patients regularly because it is considered a factor that slightly increases the future-risk of an asthma attack and asthma deaths (British Thoracic Society and Scottish Intercollegiate Guidelines Network, 2019; Tonnesen et al., 2005; Royal College of Physicians, 2015).

Table 4. Participants who needed review.

Reason for review	Participants (number, %)	Review in the last 12 months
Participants used over 12 SABA-inhalers	4, 14.8%	All were reviewed in the last 12-months
Participants used 5-12 SABA-inhalers	5, 18.5%	All were reviewed in the last 12-months
Participants used no ICS-inhalers	3, 11.1%	One participant was reviewed in the last 12-months and 2 were contacted but did not attend their AAR
Participants used less than 12 ICS inhalers	21, 77.8%	17 participants were reviewed, 3 were contacted to attend their review but had not responded and one was not reviewed
Participants who prescribed more than 6 oral CS	1, 3.7%	Referred to secondary care

SABA: Short Acting Beta Agonist, ICS: Inhaled Corticosteroid, CS: Corticosteroid.

Associated comorbidities for participants were reviewed to assess the risk for a future asthma attack (PRIMIS, 2018). Some participants with comorbid depression and/or anxiety had poorly-controlled asthma and/or had not attended their appointments. Depression is classed as a psychosocial factor that can contribute to the risk of asthma deaths (Royal College of Physicians, 2015). Emotional changes may exacerbate asthma symptoms and patients may develop poor-control due to their poor attendance at appointments (Zielinski et al., 2000; Beyhan Sagmen et al., 2020), as demonstrated in this study. Additionally, poor medication-adherence and poor self-management were suggested to be related to poor-control in asthma patients with depression (Zielinski et al., 2000; Beyhan Sagmen et al., 2020). Overall, the factors associated with a potential asthma attack among the 7 participants who had experienced one previously included overusing SABA-inhalers, having poorly-controlled asthma, having comorbid obesity and/or depression and being female. It is suggested that these factors might increase the risk of having an asthma attack in patients and should be taken into account in asthma care in adult patients (Blakey et al., 2017). Finally, the findings suggest a gap in the provision and documenting of the AAPs and a lack of a standardised process for inhaler-technique checking and recording. The recent Quality Outcomes Framework (QOF) (reward system for general practice achievements in the UK) update for 2021/2022 stated that a written AAP should be recorded on the same day as asthma review to meet the requirements for an AAR (NHS England, 2021). Additionally, it stated that patients' control of their asthma should be assessed using a validated tool like asthma control questionnaire and the score should be recorded to meet the requirements for an AAR (NHS England, 2021). However, there is still a need for systematic approach for inhaler technique check and recording (NHS England, 2021).

Strengths and limitations
RCR is considered a straightforward method to collect a large data set within a limited budget (Sarkar and Seshadri, 2014). Using routinely recorded data as a source of data may not be reliable (Allison et al., 2000; Sarkar and Seshadri, 2014), this was overcome by selecting a GP practice with a relatively high QOF achievement of 100% in asthma (Primary Care domain Specification Development Service, 2017) to ensure the completeness of patients' records and therefore the usefulness of collected data (Allison et al., 2000; Sarkar and Seshadri, 2014). A major strength of this study was that we undertook a comprehensive and detailed review of asthma management in the GP practice. Additionally, using a systematic process, strengthened the study and improved its consistency (Creswell, 2014; Vassar and Holzmann, 2013).

The sample size was limited because of ethical constraints that required patients' consent to review their records. Although 537 invitations letters were sent to asthma patients to participate in the study, 171 potential participants declined the invitation and more than half of them ignored it. However, there was diversity in age, gender, comorbidities, and AAR engagement.

The small sample number limited the generalisability of the results (Vassar and Holzmann, 2013). This was shown in the results where a high number of the participants needed a review, needed referral or have been referred to secondary care. The researcher missed the opportunity to review the medical records of those who had not responded and who might have enriched the data set because they might be different from those who participated in the study.

CONCLUSIONS

The small sample size affected the generalisability of the findings, however, reviewing the medical records of the patients one-by-one allowed the researcher to highlight issues with asthma management in the study sample that could be targeted to improve asthma management in adult patients. This study found that asthma care in the general practice requires improvement and highlighted areas that could be targeted to enhance asthma care. This study highlighted issues with asthma management including adherence to asthma medication, engagement with AARs, inhaler-technique check, AAPs and referral to secondary care that may affect the quality of asthma care. Therefore, it is vital to develop some management strategies that could be followed to improve asthma care. Periodical checks of patients' MRs are important to enhance the recording and provision of care in asthma patients. Similarly, patients with other LTCs might benefit from reviewing their MRs too. Future research could

consider approaches to increase the engagement of asthma patients, and/or utilise more systematic strategies for the provision and update of AAPs and the inhaler-technique check.

ACKNOWLEDGEMENTS

Abbreviations: A&E: Accident and Emergency, AAP: Asthma Action Plan, AAR: Annual Asthma Review, BTS: British Thoracic Society, COPD: Chronic Obstructive Pulmonary Disease, CS: Corticosteroids, GP: General Practitioner, HRA: Health Research Authority, ICS: Inhaled Corticosteroids, LABA: Long-Acting Beta-Agonist, LTCs: Long Term Conditions, MRs: Medical Records, QOF: Quality and Outcomes Framework, RCP: Royal College of Physicians, RCR: Retrospective Case-note Review, REC: Research Ethics Committee, SABA: Short-Acting Beta 2 Agonist, SIGN: Scottish Intercollegiate Guideline Network, SPSS: Statistical Package for Social Sciences, STROBE: Strengthening the Reporting of Observational Studies in Epidemiology.

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Supplementary Table 1: Data collection sheet with variables description

Variables	Description	Value label	Value	Description	Source of the data
Age	Patient's age	Age		Age	EMIS, on the top of the patient's record.
Sex	Patient's sex	Female Male Other	1 2 3	Gender	EMIS, on the top of the patient's record.
Population	Asthma status	Active asthma patient	1	Patient is on asthma register	Asthma listed on the patient's problems list
		Possible asthma	2	Patient is not on asthma register but receiving asthma medication or spirometry on the last year	Asthma not listed on the patient's problems list
BTS/SIGN treatment step		SABA	1	When patient is treated with SABA.	Check the medication history of the patient during the last 12 months then user the BTS pharmacological treatment algorithm attached to know the patient is at which step of the treatment. And the BTS/SIGN table for ICS doses.
		Step 1	2	Low dose ICS	
		Step 2	3	Inhaled LABA and low dose ICS	
		Step 3	4	Inhaled LABA + medium dose ICS or Medium dose ICS only OR Low dose ICS+ LABA + LTRA, SR-theophylline or LAMA	
		Step 4	5	High dose ICS or Medium dose ICS + LTRA, SR-theophylline or LAMA	
		Step 5	6	Oral CS +high dose ICS	
		Unclear	7	Not enough data about the doses prescribed to the patients	
Comorbid COPD		Yes No	1 2		Navigate the problems list and search for COPD.
Comorbid Anxiety		Yes No	1 2		Navigate the problems list and search for anxiety.
Comorbid Obesity		Yes No	1 2	Use the body mass index (BMI) to know if the patient is obese or not. If the BMI 30-39.9 (obese) BMI 40 or more severely obese. (NICE recommendations)	Navigate the problems list and search for obesity and check the BMI also.
Comorbid Depression		Yes No	1 2		Navigate the problems list and search for depression.
Comorbid Allergic Rhinitis		Yes No	1 2		Navigate the problems list and search for allergic rhinitis.
RCP	Royal College of Physicians (RCP) '3 questions'	Asked all 3 Q Asked 1 or 2 Q Not asked any Q Unclear	1 2 3 4	The questions are: 1. Have you had difficulty sleeping because of your asthma symptoms (including cough)? 2. Have you had your usual asthma symptoms during the day (cough, wheeze, chest tightness, or breathlessness)? 3. Has your asthma interfere with your usual activities?	The RCP questions are mentioned in the consultations list. And described under the asthma review consultation.

RCP score		No to all questions Yes to one question Yes to 2 or 3 unclear	1 2 3 4	This information is required to assess asthma control during the last 12 months.	Patients' answers to the RCP questions are mentioned in the consultations list. And described under the asthma review consultation.
SABA	Number of (SABA) inhalers received by patient over the last 12 months	Over 12 9-12 5-8 1-4 0 Unclear	1 2 3 4 5 6	This information is required to assess patients who need review depending on the number of SAB inhalers during the last 12 months.	Review the medication history.
ICS	Number of ICS prescribed for the patients over the last 12 months.	Over 12 9-12 5-8 1-4 0 Unclear	1 2 3 4 5 6	This information required to highlight patients who are undertreated and have poor asthma control during the last 12 months.	Review the medication history.
Hospital	Admitted last 12 months (related to asthma)	Admitted Not admitted Unclear	1 2 3	Count the numbers of hospital admissions related to asthma during the last 12 months.	Review patient's consultations, referrals and letters. To know if the hospital admission was related to asthma or not review the letters attached using DOCMAN.
A&E attendance	Attendance to the accident and emergency	Seen in A&E Not seen in A&E Unclear	1 2 3	Count the number of patient visits to the A&E that are related to asthma during the last 12 months.	Review patient's consultations, referrals and letters. To know if the A&E attendance was related to asthma or not review the letters attached using DOCMAN.
Oral CS	Oral CS. prescriptions over the last 12 months	6 or more Less than 6 None Unclear	1 2 3 4	Count the number of oral CS prescribed to the patient during the last 12 months.	Review the medication history.
AAR	Attendance at their annual asthma review,	Reviewed in the last 12 months Not Reviewed in the last 12 months Unclear	1 2 3	Check if the patient has been reviewed or not during the last 12 months.	Review the consultations list.
Smoking		Current smoker Non-smoking Smoking status not recorded Unclear	1 2 3 4	Smoking status.	Heath checks.
Asthma attack		Oral CS prescribed over the last 12 months No oral CS prescribed over the last 12 months Unclear	1 2 3	Check if the patient has been prescribed oral CS or not during the last 12 months.	Review the medication history.
AAP		Recorded or updated over the last 12 months Not recorded or updated over the last 12 months Unclear	1 2 3	Asthma action plan or self-management plan provided to the patient usually as a part of the review.	Review the consultations list. And review the details of asthma review.
Inhalation		Checked Non checked Unclear	1 2 3	Check if the patient's inhalation technique has been checked or not by during the last 12 months.	Review the consultations list. And review the details of asthma review.