

ORIGINAL RESEARCH

Do practices comply with key recommendations of the British Asthma Guideline? If not, why not?

*Sharon Wiener-Ogilvie^a, Hilary Pinnock^b, Guro Huby^c, Aziz Sheikh^d,
Martyn R Partridge^e, John Gillies^f

^a Clinical Guidelines Co-ordinator, Department of Public Health, NHS Borders, Newstead, Melrose, TD6 9DB, Scotland, UK

^b Clinical Research Fellow, Allergy and Respiratory Research Group, Division of Community Health Sciences: GP Section, University of Edinburgh, Scotland, UK

^c Programme Lead for Maximising Recovery from Acute Illness & Trauma, Centre for Integrated Healthcare Research, School of Health in Social Science, University of Edinburgh

^d Professor of Primary Care Research & Development, Allergy and Respiratory Research Group, Division of Community Health Sciences: GP Section, University of Edinburgh

^e Professor of Respiratory Medicine, Imperial College, NHLI at Charing Cross Hospital, London, UK

^f General Practitioner, Selkirk Medical Practice, Viewfield Lane, Selkirk, Scotland, UK

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Abstract

Aims: Amongst general practices in the NHS Borders region of Scotland, we aimed to determine compliance with the three key recommendations of the British Guideline for the Management of Asthma and to understand the nature of barriers and facilitators to their implementation.

Methods: Using piloted audit tools, a researcher extracted data from computerised and/or paper patient medical records to assess compliance with recommendations for objective diagnosis and stepwise management. Provision of asthma action plans was assessed by patient survey. Clinicians' attitude to guidelines was assessed by postal survey.

Results: Fifteen of the 24 practices in the NHS Borders region participated. Audited compliance with the three key recommendations varied markedly amongst and within practices. Whilst 367/547 (67%) of patients were treated appropriately with add-on therapy, only 58/254 (23%) of patients reported having been given an asthma action plan. Barriers to implementation identified by the clinicians' survey (response rate 64/84 - 76%) were theoretical (doubt about the evidence base and relevance to primary care, lack of knowledge and skills, misconceptions) as well as practical (lack of time and resources) and were exacerbated by poor teamwork. Facilitators were good teamwork and appropriate organisation of work within the practice.

Conclusions: Implementation of key recommendations was variable, particularly in the more complex intervention of issuing asthma action plans. An intervention to enhance compliance with these guideline recommendations will need to address both theoretical and practical barriers within the context of improved teamwork.

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Introduction

In their report on the global burden of asthma, the Global Initiative for Asthma (GINA) Program ranks Scotland as having the highest asthma prevalence in the world, with almost one in five people affected.¹ In Scotland during 2003/2004 an

estimated 127,000 patients were seen for their asthma in general practice, reflecting the high workload implications associated with this long-term disorder.²

The British Guideline for the Management of Asthma (BTS-SIGN guideline) was published jointly by the Scottish

* Corresponding author: Tel: +44 (0)131 651 4346 Fax: +44 (0)131 650 9065 E-mail: Sharon.Wiener-Ogilvie@nes.scot.nhs.uk

Figure 1. Key recommendations of the BTS SIGN asthma guidelines highlighted during the dissemination process.

✓	Objective tests should be used to try to confirm a diagnosis of asthma before long-term therapy is started.
A B ✓	Carry out a trial of other treatments before increasing the inhaled corticosteroid dose above 800 mcg a day for adults or 400 mcg a day for children.
A	Offer self-management education, including written asthma action plans focussing on individual needs, to all patients with asthma, particularly those admitted to hospital

Intercollegiate Guideline Network (SIGN) and the British Thoracic Society (BTS) in February 2003 and has since been updated annually with revisions published on both organisations' websites.³ The three key messages for primary care focused on the objective diagnosis of asthma, stepwise pharmaceutical management, and the provision of self-management education (see Figure 1). These messages were widely disseminated at the time of the guideline launch by postal mailing and web sites, with a range of educational material being produced to reflect these key messages.^{4,5}

Implementation of guidelines is recognised as a major challenge.⁶ A recent survey – which revealed wide variation in asthma care across Scotland⁷ – is echoed by our preliminary work within the Borders region which found a mixture of high- and low-compliant practices.⁸ General practice in rural areas appeared to have particular difficulties.⁷ Current education and training systems, however, have been identified as an 'inherent barrier' rather than a facilitator of improved healthcare.¹ Within the UK, recognition of the ineffectiveness of didactic lectures has led to the development of more innovative educational programmes.⁹

The primary purpose of this study was to assess the degree of compliance of clinicians in general practices within a rural health board in relation to the three key recommendations of the BTS-SIGN asthma guidelines (see Figure 1). In order to inform the development of possible future interventions, we also sought to identify the barriers and facilitators which clinicians perceived had prevented or supported them in implementing these recommendations.

Methods

Ethical approval for the study was granted by NHS Borders Research Ethics Committee, and Research Governance approval was obtained from the NHS Borders management team.

Setting and procedures

All 24 practices in NHS Borders, Scotland, were invited to participate by letter, followed-up by a telephone call to non-responding practices.

The study had two components: an audit of the practices' compliance with the three main guideline recommendations,

and a questionnaire survey exploring clinicians' perceived barriers and facilitators to their implementation.

Audit of compliance with guideline recommendations

Participating practices were visited between November 2005 and January 2006, and the practice computer databases and paper records were searched to identify evidence of compliance with the three recommendations. Absence of data was assumed to indicate that the relevant activities had not been undertaken.

Recommendation 1; Objective diagnosis of asthma

Using an audit tool developed and piloted by the UK General Practice Airways Group (GPIAG),¹⁰ the researcher examined the records of all adults (age 18 years and over) with asthma diagnosed within the last 12 months, for a record of:

- at least two peak expiratory flow (PEF) readings demonstrating 20% or more variability, confirming the diagnosis of asthma, recorded by either primary or secondary care clinicians or demonstrated by spirometry testing⁴
- a history of wheeze, chest tightness or cough
- a clinical response to treatment
- a PEF response to treatment.

Recommendation 2; Stepwise pharmacological management

Using the GPIAG audit tool¹⁰ we identified all adults (age 18 years and over) with a diagnosis of asthma and a daily dose of inhaled corticosteroid (ICS) equivalent to beclometasone dipropionate 800mcg (calculated by assessing the total quantity prescribed over the previous year, divided by 365 days). Patients taking regular oral corticosteroids, those diagnosed in the previous six months, and patients with chronic obstructive pulmonary disease (COPD) or other respiratory pathology were excluded. Manual and computer records were examined to see if patients were taking, had tried, or had been considered for, add-on therapy such as long-acting bronchodilators, leukotriene receptor antagonists, and/or theophylline.

Recommendation 3; Provision of written asthma action plans

We identified all patients on the practice asthma register with an acute episode of asthma requiring a course of oral steroids in the previous six months. In addition, we searched the hospital databases for patients who had been admitted with acute asthma.¹¹ We decided to focus on patients with acute exacerbations, since the guideline emphasises the particular benefit of having an asthma action plan in this group of patients.³ These patients were sent a brief questionnaire which asked if they had been given a written asthma action plan. For clarity, we used a question piloted by Haughney *et al*² which explained the terminology. The patients were also

asked who gave them the plan, whether they had a peak flow meter, or whether they held an emergency supply of steroids tablets. One reminder was sent to non-responders.

Postal survey of clinicians' attitudes to the guideline Questionnaire design¹³

Designed by a multidisciplinary team with experience of guideline development and dissemination,^{3,4} and audit projects,⁸ our questions were based on a detailed review of the literature on the implementation of guidelines. We also asked clinicians whether they were aware of the three main recommendations, whether they felt that the implementation of these recommendations could lead to better management of patients with asthma, whether they felt that organisational changes could improve implementation, and we asked some specific questions about their use of asthma action plans. The questionnaire invited free text comments on factors that prevented or facilitated the implementation of the recommendations in their practice. Minor adjustments were made after initial piloting.

Administration of the questionnaire¹⁴

We posted the questionnaire to 66 general practitioners (GPs), and 18 practice nurses responsible for running asthma clinics. An electronic reminder was sent to all non-respondents two weeks after the initial mailing.

Data analysis

Categorical and continuous data were analysed appropriately depending on type and distribution of data using SPSS version 14.0. In addition to descriptive statistics, GP and nurse responses were compared using Chi-squared or independent sample t-tests. A multidisciplinary group analysed free-text responses by developing a coding frame and identifying key emerging themes.^{13,14}

Results

Fifteen (63%) of the 24 practices in NHS Borders participated in the study. There were no significant differences between the demography of participating and non-participating practices (see Table 1). Thirteen of the 15 participating practices (87%) offered nurse-led, structured asthma care.

Responses to the clinicians' survey were received from 51/66 GPs (77%) and 13/18 nurses (72%). There were no significant differences between respondents and non-respondents in gender and average years from graduation. All the nurses were female and reported a special interest in asthma, with 85% having a diploma in asthma management. Only 24% of GPs reported that they had received specific training in asthma care.

There was no significant difference between the responses from the doctors and nurses: results are therefore presented as combined scores.

Recommendation 1; Objective diagnosis of asthma

In total, 97 newly diagnosed patients with asthma were identified by the practices – 6.5 patients per practice (Interquartile range 3-7). Two PEF rates demonstrating 20% or more variability confirmed the diagnosis in 65/97 (67.0%) of patients. The results for individual practices are shown in Figure 2. In addition, a history of wheeze, chest tightness or cough was recorded in 83/97 (85.5%), a clinical response to treatment in 67/97 (69.0%), and a PEF response to treatment in 51/97 (52.5%).

The majority of GPs and nurses were aware of this recommendation, though some had doubts about whether implementation would improve management and outcomes. Details of the survey responses are given in Table 2.

Table 1. Comparison of participating to non-participating practices.

	Participating	Non-participating	Differences (independent t test)
Number of practices	15	9	
Number of training practices	5/15	2/9	
Average number of GPs in the practice	4.33	3.22	p=0.20
Practice list size	5075.07	4073.33	p=0.38
Average deprivation (SIMD) 1=least deprived; 5=most deprived *	2.23	2.38	p=0.79
Average Quality and Outcome Framework score	1036.45	1034.61	p=0.80
Percentage of asthmatic out of practice list	5.72%	6.42%	p=0.36

* SIMD: Scottish Index of Multiple Deprivation 2004 quintiles. SIMD (2004) contained 31 indicators in the six individual domains of Current Income, Employment, Housing, Health, Education, Skills and Training and Geographic Access to Services and Telecommunications and is used by the Scottish health department to assess deprivation at general practice level.

These data supplied by ISD Scotland, August 2005. Request reference IR2005-02445

Figure 2. Results of audit of practices' compliance with the three key recommendations.

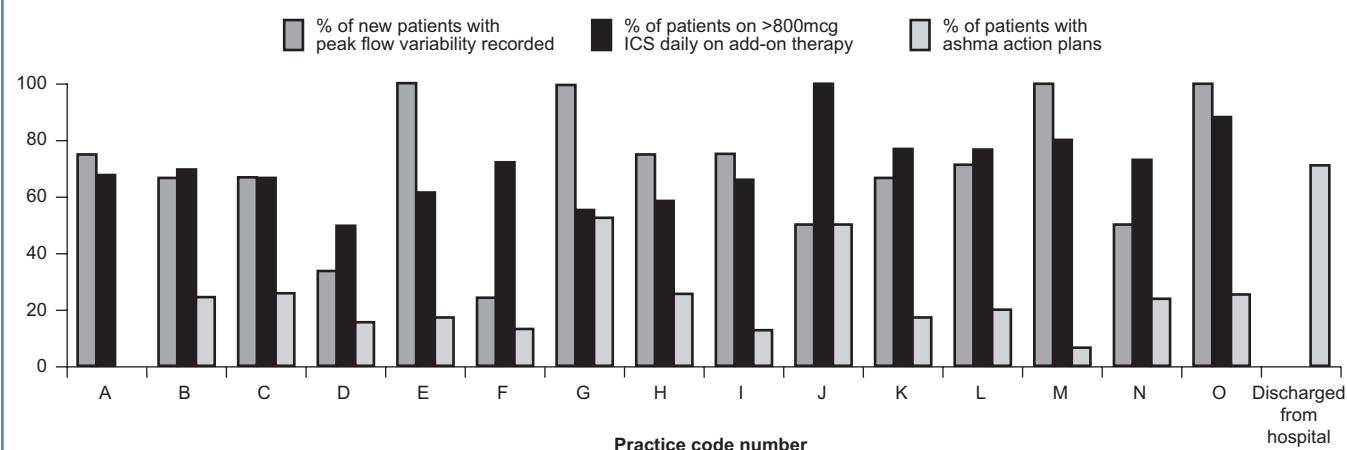


Figure 2 illustrates the results of the audit for individual practices (A to O) of compliance with the three key recommendations:

1. The percentage of patients with asthma diagnosed in the previous year who had peak flow variability recorded
2. The percentage of adults with asthma prescribed a dose of inhaled steroid equivalent to 800mcg beclomethasone or more who were on, or had been considered for, add-on therapy
3. The percentage of patients with an acute exacerbation of asthma in the previous year and who had a written asthma action plan. The final column shows the proportion of patients discharged from hospital who had an asthma action plan.

The free text comments echoed this scepticism, with several GPs considering that objective diagnosis was "not always necessary" and "cannot substitute for clinical judgement" though it "may help if diagnosis is in doubt". The recommendation to demonstrate variability was usually interpreted as a requirement for a formal reversibility test (which was regarded as the responsibility of the nurse and often distinct from the process of medical diagnosis) rather than the more flexible approach of demonstrating variability during the course of management:

"This important diagnostic test sometimes omitted in favour of a 'trial of therapy'."

GP 014

"Patients generally leave it late on presenting and are unwell with symptoms; to then ask them to go away and do peak flows – something not appropriate."

Nurse 004

"Won't affect the management of asthma patients but will lead to more accurate diagnosis."

GP 021.

The main barriers to implementation of this recommendation were perceived to be time (clinic time, but also time for developing team work, and improving knowledge and skills), manpower (nursing, administrative support, and a lead GP), team work (GP and nurse liaison), organisational issues (co-ordination of work within the practice, availability of protocols), patient-related issues (motivation, difficulty in using peak flow meters) and the confines of space.

"Normally try to do reversibility test using spirometry + salbutamol+ steroids but this takes time."

GP 046

"Diagnosis of asthma often evolves/emerges over time so patient likely to see different health professionals at different times."

GP 008

"Patients not motivated to attend to confirm diagnosis unless disabled by symptoms."

GP 055

Better co-ordination of care within the practice, availability of agreed protocols, and further education, were identified as means to implement the recommendation.

Recommendation 2; Stepwise pharmaceutical management

Of the 3,180 patients actively receiving treatment for their asthma, 547 (17%) were taking a daily dose of inhaled steroids equivalent to over 800mcg of beclometasone. Of these, 367/547 (67.1%) were taking, or had had a trial of, add-on therapy (see Figure 2 for individual practice performance).

All responding clinicians were aware of this recommendation and most agreed that implementation of this recommendation could lead to better management of people with asthma (see Table 2).

The free text comments were generally supportive of the recommendation, though the 800mcg limit was questioned because a commonly used 250mcg beclometasone inhaler (resulting in a total daily dose of 1,000mcg) was seen as more

Table 2. Professional questionnaire responses.

			Response	
Recommendation 1 Objective tests should be used to try to confirm a diagnosis of asthma before long-term therapy is started. Audit performance: 67.0%	Were you aware of this recommendation?	Yes	61/64	(95.3%)
	Would implementation lead to better management of patients with asthma?	Yes	45/62	(72.6%)
		No	5/62	(8.1%)
		Not sure	12/62	(19.3%)
	Do you need to re-organise asthma care to improve implementation?	Yes	14/64	(21.8%)
		No	44/64	(68.7%)
Not sure		5/64	(7.8%)	
Recommendation 2 Carry out a trial of other treatments before increasing the inhaled corticosteroid dose above 800 mcg a day for adults. Audit performance: 67.1%	Were you aware of this recommendation?	Yes	64/64	(100%)
	Would implementation lead to better management of patients with asthma?	Yes	55/64	(85.9%)
		No	0	(0%)
		Not sure	9/64	(14.1%)
	Do you need to re-organise asthma care to improve implementation?	Yes	9/64	(14.1%)
		No	48/64	(75%)
Not sure		7/64	(10.9%)	
Recommendation 3 Offer self-management education, including written asthma action plans focussing on individual needs, to all patients with asthma, particularly those admitted to hospital. Audit performance: 22.8%	Were you aware of this recommendation?	Yes	63/64	(98.4%)
	Would implementation lead to better management of patients with asthma??	Yes	51/64	(79.7%)
		No	1/64	(1.6%)
		Not sure	12/64	(18.7%)
	Do you need to re-organise asthma care to improve implementation?	Yes	29/63	(46.0%)
		No	24/63	(38%)
Not sure		10/63	(16%)	

cost-effective than using a 200mcg inhaler:

"I would like evidence that 1000mcg is significantly worse than 800mcg or alternatively that it is not any more expensive."

GP 033

The need to "change old habits" and "reverse the historical use of high doses of inhaled steroids", was cited as a barrier, as well as patient factors such as poor compliance with multiple prescriptions, inflexibility of fixed combination inhalers, and limited motivation to attend clinics. Improving knowledge on the use of add-on therapy, particularly amongst nurses, reviewing clinic procedures within the practice, and better communication amongst health professionals, were seen as means to implement the recommendation.

Recommendation 3: Provision of asthma action plans

A total of 389 questionnaires were sent to patients who had had an acute attack requiring steroids or hospitalisation in the previous six months: 262 (66%) were returned, six of whom

did not wish to participate, and four said they did not have asthma. Of the responders, 58/254 (23%) reported that they had a written asthma action plan (Figure 2 illustrates individual practice performance). Table 3 describes the professional provision of action plans and patients' possession of the tools necessary for self-treatment.

Almost all clinicians were aware of the recommendation to provide self-management education and the majority agreed it could lead to better management of patients. Nevertheless, many of the free-text comments suggested that clinicians were not completely convinced about the applicability of asthma action plans in primary care, and remained uncertain regarding the exact content of the plan. Self-management education was seen as the responsibility of nurses, and many GPs felt de-skilled due to lack of experience. Nurses implied that they felt unsupported, as their GPs were "not aware" of the management plans in use in the practice. Manpower issues – in particular, the availability of trained nurses – were also raised.

Table 3. Professional and patient use of asthma action plans.

		GPs	Nurses	Chi2
How confident are you in putting together action plans for your patients?	Not at all	15/50 (30.0%)	0	5.12 p=0.02
	Quite confident	29/50 (58.0%)	9/13 (69.2%)	
	Very confident	6/50 (12.0%)	4/13 (30.8%)	
How confident are you explaining action plan to patients?	Not at all	8/49 (16.3%)	0	2.44 p=0.12
	Quite confident	34/49 (69.4%)	7/13 (53.8%)	
	Very confident	7/49 (14.3%)	6/13 (46.2%)	
Do you normally provide patients with a <i>written</i> action plan?	Yes	6/47 (12.8%)	9/13 (69.2%)	17.32 p<0.001
Are written templates for asthma action plan readily available in your practice?	Yes	24/46 (52.2%)	10/13 (76.9%)	2.54 p=0.11
Patients				
Has your doctor or asthma nurse provided you with an asthma treatment plan? By "treatment plan" I mean a plan written for you by your physician or nurse, which tells you how to recognise that your asthma is worsening and especially advises you which treatments to increase or start, and when. Would you say that you have been provided with this?	Yes	58/254 (22.8%)		
	No written information was given but I was told what to do	157/254 (61.8%)		
	No I have never been given advice	40/254 (15.3%)		
If you were provided with asthma treatment plan, who gave it to you?	My own GP	11/57 19.3%		
	A nurse in the GP practice	28/57 49.1%		
	A nurse in the hospital	15/57 26.3%		
	A doctor in the hospital	3/57 5.2%		
Do you have an emergency supply of steroid tablets?	Yes, I know when to take them	62/254 (24.4%)		
	Yes, but I'd rather see the doctor before I took them	13/254 (5.1%)		
	Yes, but I don't know what they are for	0/254 (0%)		
	No	179/254 (70.7%)		
Do you have a peak flow meter at home?	Yes	167/254 65.7%		
	Yes, but I don't use it	12/254 4.7%		
	No	75/254 29.5%		

"Evidence that action plans in mild to moderate asthma improves outcomes appears to be equivocal."
GP013

"[Asthma action plan] – seems to be some controversy over whether action should depend on peak flow/symptoms."

Nurse 020

"Education very important and verbal instruction

simple and clear often is best."

Nurse 020

"Limited personal experience: has become province of asthma nurse."

GP 003

"Perhaps we leave things to practice nurses too much."

GP 005

Recognition that providing self-management education

was a complex intervention which involved explaining, negotiating and agreeing an action plan with patients, highlighted a lack of clinical time:

"Time is a factor as it takes time to complete as well as review/assess patient and do computer work! All in 15 MINUTES!"

Nurse 005

"[We need] time to negotiate the plan and have agreement rather than just thrusting it at the patients and ticking the box."

GP 045

GPs suggested that a standardised proforma would be beneficial, though some nurses were disillusioned with the resources available, either feeling that they were too complex or that they limited the freedom to personalise. The need to be "aware of literacy issues" was also mentioned:

"A standardised written action plan which can be personalised to each individual patient would a) save time b) ensure all important areas are covered."

GP 008

"Don't like the proforma action plans, I don't seem to be able to individualise it for the patient. I have my own version or I free write for the patient."

Nurse 002

"Too complex for most patients, need more simple alternative for mild asthma."

Nurse 006

Doubts about patients' motivation, interest and willingness to take responsibility for self-management, attendance for review appointments, compliance with self-management plans, and confidence to use plans were raised – more commonly by GPs – and often seeming to reflect previous disappointing experience with self-management education. Fear about medico-legal redress was another factor raised.

"Self management plans; many patients have lost or mislaid it, ignore parents often don't look at it prior to bringing a child with acute attack."

GP 011

"Lack confidence to implement without confirmation from practice nurse or GP."

GP 047

"Lack of patient interest, lost plans, not following plans."

GP 003

"Health professionals are hesitant to commit to writing (i.e. particular peak flow level)."

GP 017

Discussion

Our audit revealed that compliance with the three key guideline messages for primary care varied amongst and within practices, with practices complying with some of the

recommendations but not with others. This occurred despite a very high proportion of clinicians reporting that they were aware of all the recommendations and the majority agreeing that implementation would lead to better management of patients with asthma.

A lack of knowledge and skills, organisational issues, and patient-related issues, were commonly reported barriers to the implementation of all three recommendations, whilst it was suggested that interventions addressing these issues might facilitate implementation. Delegation of responsibility to the nurse was a common theme, which could lead to poor co-ordination of care. Both GPs and nurses identified training needs: nurses felt they needed more knowledge (especially concerning medications) while GPs highlighted that they felt de-skilled as their involvement in asthma care (especially provision of asthma action plans) was limited. Time was a particular problem, highlighted as a barrier to the more complex recommendations of providing self-management education and making an objective diagnosis.

More fundamentally, the free-text comments suggested some important conceptual barriers. Clinicians (especially GPs) questioned the evidence underpinning the recommendations (e.g. the benefit of objective testing to confirm a diagnosis which they felt they could make clinically) or raised doubts about applicability in primary care (e.g. the benefit of self-management education in patients with mild asthma). Some misconceptions were evident (e.g. the recommendation that the diagnosis should be confirmed by demonstrating variability was frequently interpreted as implying the need for a formal reversibility test). Provision of asthma action plans is a complex intervention¹⁵ and not surprisingly, uncertainty, confusion, and lack of confidence in implementation were common. These comments provide an insight into the perspectives of primary care practitioners which could usefully inform practical aspects of future guideline iterations.

Limitations of the study

The study focused on general practices in a single rural health board in Scotland with an average list size of 5,075 patients; thus, the results may be not applicable to smaller or larger practices in areas with different demographics. We recruited 63% of practices in the study area and our results may not be representative of all practices, though the demography of participating and non-participating practices was similar. Our focus on the implementation of three specific recommendations in adults cannot provide a comprehensive picture of the impact of the asthma guideline on clinical care; however, the selected recommendations were those disseminated prominently when the guideline was launched and may be expected to be the most widely recognised. Furthermore, we limited our data collection to specific criteria and did not, for example, explore further the use of the different add-on therapies. Our

retrospective audit may have underestimated activity since actions may have been undertaken but not recorded. Finally, a questionnaire, even with free text responses, can only provide a relatively superficial overview of attitudes, though it can highlight important issues for further exploration.

Main strengths of the study

Independent researchers objectively assessed compliance with the three key recommendations of the BTS-SIGN guideline, using piloted audit tools.^{10,12} The response rates for both the professional survey (77% of GPs) and patient survey (66%) were good. Our synthesis of the quantitative and qualitative data from the questionnaire responses has enabled a more rounded appreciation of the key issues.

Interpretation of findings in relation to previously published work

The recommendation to provide asthma action plans was particularly poorly implemented. Although clinicians were aware of the recommendation, only 23% of the patients we sampled reported having a written asthma action plan, with considerable variation amongst practices. Two-thirds, however, reported receiving verbal advice on their asthma management. Our results are in line with those published by others¹² and by the National Asthma Campaign in Scotland,⁷ which found that only 22% of practices in Borders had protocols for the provision of asthma action plans. Provision of written asthma action plans may not be considered a high priority by GPs,¹⁶ despite being generally welcomed by patients.¹²

Despite evidence that including instructions on the use of inhaled and oral steroids in asthma action plans improves morbidity,¹⁷ only a quarter had an emergency supply of steroid tablets. There is a need to explore further this limited use.

Echoing the findings of Cabana *et al* in their systematic review,¹⁸ Grol and Wensing¹⁹ described the "Precede-Proceed" model in relation to the implementation of change in practice. They suggested that there is a distinction between 'predisposing factors' (e.g. knowledge and attitude), 'enabling factors' (e.g. capacity, resources, service availability) and 're-enforcing factors' (e.g. opinion and behaviour of others).

Our data suggest that there is still a need to address 'predisposing factors,' as clinicians questioned the evidence underpinning recommendations, supporting the argument that disagreement of primary care doctors with national guidelines is a potential cause for poor implementation.^{18,20,21} Lack of engagement with evidence and guidelines suggests a need for an increased primary care research base to inform guideline development.

Capacity and resources, far from being 'enabling factors', were frequently cited as barriers. GPs expressed disenchantment with patients' motivation to self-manage, though this may in part reflect the difficulty of involving patients as partners in their own treatment within the limited time available.

Poor teamwork reduced the opportunity for 're-enforcement' since skills were rarely shared. Delegation of responsibilities between doctors and nurse may impact on the skills of GPs to deliver self-management education. GPs were less likely to provide, or have templates for, asthma action plans, and were less confident in putting together and explaining asthma action plans than nurses.

Research into guideline implementation in primary care has suggested that strategies might be more effective when tailored to pre-identified barriers.²²⁻²⁴ Linking the performance data from our audit with an in-depth exploration of the barriers identified by our survey could increase understanding of good practice and inform a tailored implementation strategy.

Conclusions

Our findings suggest that, despite clinicians' awareness of the guidelines, compliance with the main guideline recommendations varied amongst and within practices, with provision of asthma action plans (potentially the most complex of the recommendations) being particularly poorly implemented. Commonly identified barriers to implementation encompassed 'pre-disposing', 'enabling' and re-enforcing' factors. A deeper understanding of these barriers could facilitate the development of an appropriate intervention.

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Conflict of interest declaration

None declared.

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