

Scottish School of Primary Care

GP Clusters

Briefing

Paper 7



Asthma

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Collaborative Quality Improvement in General Practice Clusters

This paper is the seventh in a series that relates to areas of quality and safety on which general practice clusters could usefully focus improvement activity. Each paper summarises research, guidelines and other evidence about areas of care which can be improved, and improvement methods and interventions.

Asthma

Asthma is a common long-term condition that affects people of all ages. Poor control results in peoples' lives being affected by significant symptoms, interrupting work and leisure activities, risking acute attacks and occasionally deaths. Strategies for improvement, based on key recommendations of the British Thoracic Society/Scottish Intercollegiate Guideline Network British Asthma Guideline are: a structured approach to making and recording the diagnosis of asthma; assessing and acting to improve control and reduce risk of attack; implementing supporting self-management. Addressing these challenges in Scotland could substantially improve the lives of people living with asthma and their families, reducing use of unscheduled care and the burden on healthcare, as well as mitigating the impact on the wider societal burden of school and work absenteeism.

The problem

Asthma is common (estimated 5.4 million people in UK) and responsible for over 6 million primary care consultations, and nearly 100,000 hospital admissions each year in the UK.¹ Asthma and allergy cost the NHS an estimated £1 billion a year in England and Wales;² with evidence to suggest these costs are increasing globally.³ Societal costs accumulate throughout life with asthma-related absence from school/work, disability and premature retirement. Much of this morbidity is preventable with appropriate/timely management.⁴ Asthma is responsible for ~1,000 deaths/year in the UK.⁵

The challenge of diagnosis

Recent high profile publications have raised concerns about the accuracy of asthma diagnosis, with studies in both adults and children suggesting over-diagnosis,^{6,7} though these studies are limited by the challenge of confirming a clinical diagnosis, in a variable condition for which there is no definitive objective test. The NICE guideline recommended increased use of tests (especially spirometry and fractional exhaled nitric oxide (FeNO));⁸ the updated BTS/SIGN guideline explored pragmatic diagnostic algorithms and recommended a structured clinical approach supported by objective tests.⁴

“Complacency” in management

The term ‘complacency’ was widely used after the launch of the National Review of Asthma Deaths (NRAD) in 2014,⁹ which identified a range of deficiencies in care that contributed to the deaths. Only 57% of the patients who died had attended an asthma review in the previous year, and a substantial proportion of

those reviews did not comply with the BTS/SIGN recommendations. Inappropriate prescribing was a factor in nearly half the deaths: excessive use of reliever medication (39% had been prescribed more than 12 salbutamol inhalers in the previous year), underuse of inhaled steroids, and a few patients were using long-acting beta₂ agonists monotherapy.

Implementing self-management

Despite a strong evidence base confirming that self-management for people with asthma, including a personalised asthma action plan and supported by regular professional review, improves health outcomes,^{4,10,11} less than a third of people with asthma in the UK have an action plan.¹² Only 23% of the patients whose death was investigated in the NRAD survey had been provided with an action plan, potentially contributing to the delays that resulted in over half of the patients dying without receiving medical help.⁹

What evidence supports asthma management in primary care?

Guidelines

The British Asthma Guideline was first published in 1990,¹³ and since 2003 has been developed in collaboration with the Scottish Intercollegiate Guideline Network. The latter is updated approximately every 18 months, with the latest update published in 2019.⁴ It includes recommendations on the diagnosis, management and self-management of asthma in adults and children.

The Global Initiative for Asthma (GINA) is an international evidence-based guideline, which is updated annually.¹¹

The National Institute of Health and Clinical Excellence has published topic specific guidance on inhaler devices,¹⁴⁻¹⁷ some specific treatment options, use of FeNO,¹⁸ and a guideline on diagnosis, monitoring and management of asthma.⁸

The Cochrane Airways group continues to publish high quality syntheses of evidence related to asthma.¹⁹

An overview, commissioned by the National Institute of Health Research, of the literature on supported self-management (including asthma) provides an overarching synthesis of the data,²⁰ with an updated asthma meta-review including health economic evidence published in 2017.¹⁰

Core elements for quality improvement

1. Improving accuracy and recording of diagnosis

The diagnosis of asthma is a clinical one.⁴ The BTS/SIGN guideline identifies two key principles underpinning the diagnosis of asthma:

- Tests influence the probability of asthma but do not prove a diagnosis. Diagnosis is based on a structured clinical assessment (see below and table 1) supported by objective tests that seek to demonstrate variable airflow obstruction and/or



the presence of airway inflammation. All the symptoms, signs, and tests have significant false positive and false negative rates. The diagnosis is thus based on probability with the interpretation of tests determined by the pre-test probability.

- Asthma status and the outcome of diagnostic tests for asthma vary over time. Asthma is a variable condition, which means that tests undertaken when a patient is asymptomatic may be normal – and often are normal in the relatively mild/intermittent asthmatics managed in primary care. Tests, such as spirometry, may increase the probability of asthma if they are positive, but cannot be used to exclude the diagnosis.²¹ On the other hand, time may be used to make the diagnosis if (say) lung function when a patient is asymptomatic is significantly better than lung function when they are symptomatic.

The BTS/SIGN guideline builds on these concepts and suggests a pragmatic approach that has quality implications for primary care. They recommend a defined 'structured clinical assessment' (see Table 1) which uses all the information available to the primary care clinician: a careful history of episodic symptoms, supported by information from the electronic health record, wheeze heard by a professional, corroborative evidence of attacks (e.g. variable signs/peak flows recorded when symptomatic and when recovered), a personal or family history of atopy, eosinophilia on a previous blood test.

Based on this structured clinical assessment, the probability of asthma may be considered to be:

- High: code as 'suspected asthma' and commence a monitored initiation of treatment, confirming the diagnosis if the objective response to treatment is good (and reviewing the diagnosis if response is poor).
- Intermediate: undertake spirometry to look for variable airflow obstruction, and other tests (e.g. FeNO) to inform the probability of asthma, commencing a monitored initiation of treatment if tests suggest that asthma seems probable. If the patient is currently asymptomatic, tests may need to be scheduled during a symptomatic episode.
- Low: investigate and manage for the other more likely diagnosis

This algorithm is illustrated in Figure 1, and further details are available from the BTS/SIGN guideline.⁴

2. Improving assessment of control, risk of attacks and adjusting management

Assessing control

Control should be assessed objectively. The Royal College of Physicians three questions (RCP3Q) are simple morbidity questions that can identify poor control. If all three questions are 'no', control is probably good; a positive answer (especially night-time waking and asthma affecting activity) should lead to further assessment of control.²² Other validated questionnaires (Asthma Control Questionnaire (ACQ); Asthma Control Test (ACT)) may be used to assess current control.¹¹

Assessing risk of attacks

Identifying future risk of asthma attacks is an important component of asthma reviews.⁴ In both adults and children a history of previous attacks, poor asthma control, and overuse of reliever medication are markers of increased risk of attacks. Other predictors in adults include smoking, older age, female gender, obesity and depression; in children predictors include, comorbid atopic conditions, younger age, obesity, and exposure to environmental tobacco smoke.²³ Assessment of risk enables clinicians to tailor care to reduce the patient's risk status by supporting self-management (see below), adjusting treatment, and reviewing regularly.⁴ At population level, healthcare systems can target high-risk communities, and promote reduction in environmental smoke.

Adjusting management

Detection of poor control should lead to review of the diagnosis, inhaler technique, adherence, avoiding triggers and treating rhinitis before stepping up asthma treatment.²⁴ Changes to the summary of management (see figure 2) in recent updates of the BTS/SIGN guideline include:

- The use of short-acting beta₂ agonist (SABA) is now illustrated as rescue medication within all therapeutic regimes. Low dose inhaled steroids (ICS) is now the first treatment option.
- The therapeutic approach for people not controlled on low-dose inhaled steroids has been divided into an initial option (adding a long-acting beta₂ agonist (LABA)) and other strategies (increasing dose of ICS; additional or alternative add-on therapies).
- The initiation of treatment is illustrated a stand-alone process, to emphasise the importance of objectively assessing response, titrating down the dose to the lowest dose that relieves symptoms, and providing asthma self-management before setting-up a repeat prescription.
- High dose treatments and addition of third or fourth line drugs are now described as 'specialist therapies' and should prompt referral.⁴

Supported self-management

Asthma is, by definition, a variable condition so all people with asthma should have an action plan describing the prompt action they should take if their control deteriorates (including increasing inhaled steroids, commencing oral steroids and when to seek urgent clinical help).^{4,25} Supported self-management for people with asthma, including a personal asthma action plan, reduces emergency use of healthcare resources and improves markers of asthma control.^{4,8,10,11} The evidence encompasses patients of all ages (excluding pre-school children), ethnic minority groups (using culturally adapted approaches); and in all healthcare settings.^{4,10}

Implementation in clinical practice is challenging, but the findings of a systematic review of implementation



studies show that self-management support can be implemented effectively with significant improvements in morbidity and even mortality²⁶. Effective interventions adopt a 'whole systems approach': combining active engagement of patients, with training and motivation of professionals embedded within an organisation in which self-management is valued.²⁶

Implementation in real-life NHS practice

Facilitating a structured approach to diagnosis

The key changes are to facilitate a structured clinical approach and to encourage detailed recording of the basis for the diagnosis. One approach would be the development of an 'asthma diagnosis' templates which guides the clinician systematically to undertake and record:

- The structured clinical assessment and the probability of asthma
- Objective tests and the clinical status of the patient at the time the tests were done
- Monitored initiation of treatment,
- Final diagnosis and the basis on which the diagnosis was made.

Note that these tasks do not all have to be done at one point in time. Asthma is a variable condition and undertaking tests during symptomatic episodes compared to tests when asymptomatic (potentially weeks or months apart) may provide useful information.

Facilitating assessment of control, risk of attacks and appropriate action

In UK general practices asthma reviews are typically undertaken by practice nurses²⁷. Training is essential so that they are able not only to assess control but also to take immediate action if poor control is detected.⁴ This implies that they should be trained and experienced to make treatment decisions, and empowered within the practice to change prescriptions - or they must have prompt referral systems to someone who can take these decisions. Use of a review template may help structure a review, but should be used flexibly so as not to over-ride the patient's agenda.

An annual routine review may be facilitated by offering flexible convenient options, including telephone reviews for those with good control (assessed with the RCP3Qs), at low risk of an attack (no recent previous attack and low use of SABA inhalers), and ideally already owning an action plan.^{28,29} Telephone calls may also be useful for reaching non-attenders,³⁰ completing a telephone review if control is good, or establishing a relationship and arranging a face-to-face review if necessary. Strategies should be in place to ensure that reviews are scheduled after an attack - and especially following attendance at an accident and emergency department or admission.

Facilitating supported self-management

All people with asthma should have on-going support to enable them to manage their own asthma,^{4,8,11} and action plans should be reviewed/refined regularly and rehearsed at every appropriate opportunity. Practices should expect that self-management is a component of every asthma consultation, and provide flexible access for patient queries about their asthma management.³¹ Professionals should be skilled and confident to deliver

self-management education, and patient resources (information, a range of action plans to suit preferences and clinical circumstances) should be readily available.²⁷

Implications for collaborative quality improvement in general practice clusters

Organisation of diagnostic services

Whilst many diagnostic tests (for example, peak flows, spirometry with bronchodilator reversibility) are readily available in primary care, others (such as FeNO, skin-prick testing, challenge tests) may require referral to a diagnostic centre. Streamlined referral pathways should be developed for investigations not available or appropriate in primary care.

Audit:

- Proportion of patients with diagnostic code H33 asthma in whom the basis for the diagnosis is clearly recorded.
- Proportion of patients who commenced treatment for asthma in whom an objective response is recorded.

Targeting care to those at greater risk

Risk factors for severe and potentially life-threatening attacks are known^{4,9} and reflect:

- Disease-specific factors: poor control, history of severe attacks, requiring multiple therapies to achieve control, over-use of short-acting-beta-agonists (e.g. more than 12 reliever inhalers a year)
- Patient/context-specific factors: history of psychosocial problems, defaulting asthma reviews, poor adherence to preventer medication.

A small study showed that identifying patients at risk of severe asthma attacks and implementing at-risk registers resulted in a decrease in *catastrophic events* (A&E attendances, admissions) and an increase in the number of oral steroid courses though no overall difference in the composite end-point.³² This approach is currently being tested in a UK-wide trial. In the meantime, practices should consider identifying and targeting care at those at higher risk. Overuse of short-acting beta-agonists is an important marker associated with asthma deaths.⁹

Audit:

- Proportion of patients recorded as having poorly controlled asthma (positive RCP3Qs; overuse of short-acting beta-agonists, attack within the previous year) in whom appropriate action was taken.
- Proportion of patients with asthma who are receiving more than 12 short-acting beta-agonists inhalers a year.
- Proportion of patients with asthma using long-acting-beta-agonists monotherapy (this is associated with an increased risk of severe, life-threatening asthma and asthma deaths)



Organisational responsibility for asthma self-management

Providers of services for people with asthma should consider how they can develop an organisation which prioritises and actively supports self management. This could include strategies to proactively engage and empower patients, train and motivate professionals, as well as providing an environment that promotes self management and monitors implementation.²⁶ Complex whole systems interventions that explicitly address patient education, professional training and organisational commitment are associated with improvement in process measures, markets of asthma control, and reduced use of unscheduled healthcare.²⁶ Quality improvement programmes may operate at practice level to promote ownership of plans,³³ or involve collaborations at regional or national level to reduce hospital admissions, deaths, and time off work.^{34, 35}

Audit

- Proportion of patients with asthma in whom provision of an action plan is recorded.

Further reading

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Resources

Asthma UK provide a range of information and self-management resources. <https://www.asthma.org.uk>

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Figure 1. Algorithm for diagnosis of asthma (reproduced with permission from the BTS/SIGN guideline.4)

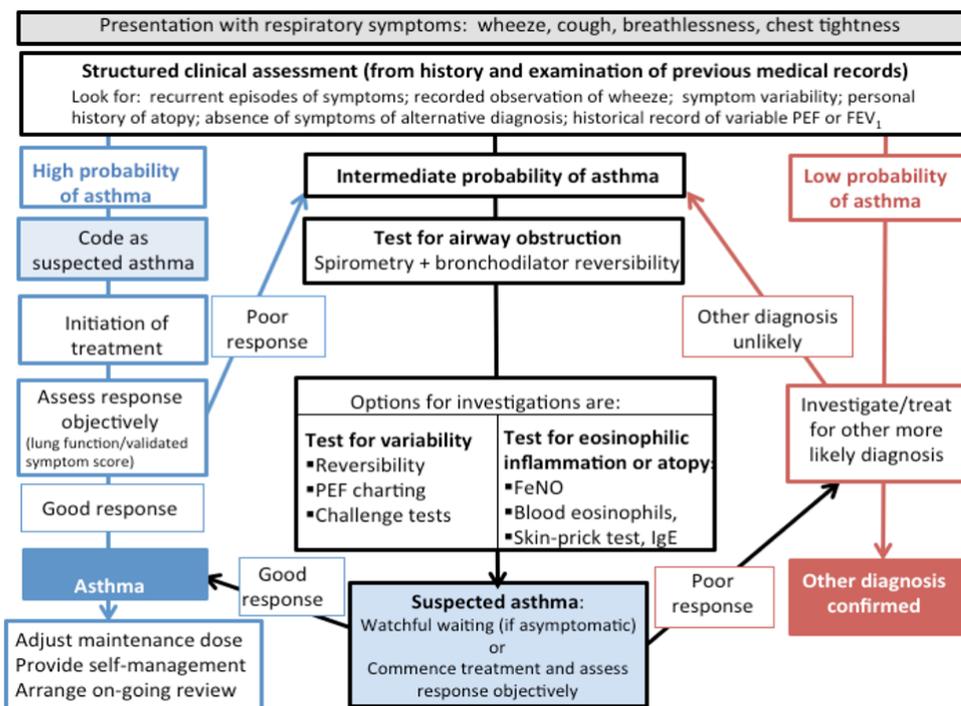


Figure 2. Summary of management in adults (reproduced with permission from the BTS/SIGN guideline.4)

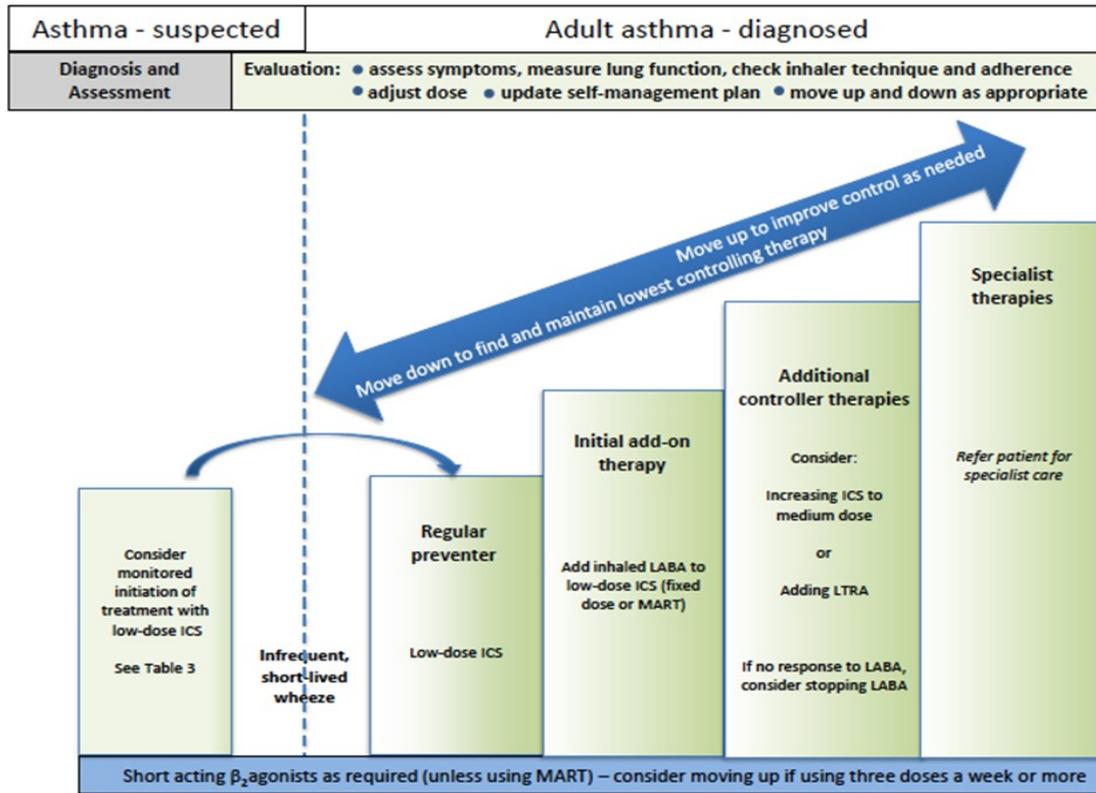


Table 1. Initial structured clinical assessment (reproduced with permission from the BTS/SIGN guideline. ⁴)

<p>More than one of the symptoms of wheeze, breathlessness, chest tightness and cough occurring in episodes with periods of no (or minimal) symptoms between episodes. Note that this excludes cough as an isolated symptom in children. For example:</p> <p>A documented history of acute attacks of wheeze, with symptomatic and objective improvement with treatment</p> <p>Recurrent intermittent episodes of symptoms triggered by allergen exposure as well as viral infections and exacerbated by exercise and cold air, and emotion or laughter in children</p> <p>In adults, symptoms triggered by taking non-steroidal anti-inflammatory medication or beta-blockers.</p> <p>An historical record of significantly lower FEV₁ or PEF during symptomatic episodes compared to asymptomatic periods provides objective confirmation of obstructive nature of the episodic symptoms.</p>
<p>Wheeze confirmed by a healthcare professional on auscultation</p> <p>It is important to distinguish wheezing from other respiratory noises, such as stridor or rattly breathing.</p> <p>Repeatedly normal examination of chest when symptomatic reduces the probability of asthma.</p>
<p>Evidence of diurnal variability</p> <p>Symptoms which are worse at night or in the early morning</p>
<p>Atopic history.</p> <p>Personal history of an atopic disorder (ie, eczema or allergic rhinitis) or a family history of asthma and/or atopic disorders, potentially corroborated by a previous record of raised allergen-specific IgE levels, positive skin prick tests to aeroallergens or blood eosinophilia</p>
<p>Absence of symptoms, signs or clinical history to suggest alternative diagnoses (including</p>

