British Guideline on the management of asthma: SIGN Clinical Guideline 141, 2014

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Information about the current guideline

This latest revision of national guidance on asthma management was produced jointly by the British Thoracic Society (BTS) and the Scottish Intercollegiate Guidelines Network (SIGN) in October 2014, and marks the largest revision to date including changes to the guideline structure.(1) Established standards for guideline development were followed to produce recommendations for the emergency and long-term management of asthma in children, adolescents and adults. There was wide stakeholder input from national and international individuals and institutions, with opportunity for feedback via conferences and websites; the guideline was also reviewed by independent expert referees and underwent editorial review to ensure comments were addressed and bias was minimised. It provides a basis for high quality care for acute and chronic asthma, and a stimulus for research in the areas in which evidence is still lacking.

Previous guidelines and associated resources

The first joint BTS/SIGN asthma guideline was published in 2003 as a 'living guideline', with annual updates between 2004 and 2012, and every two years since; this is the first such update. In this revision BTS/SIGN have helpfully presented a new section of key recommendations for implementation, and linked these to the NICE Quality Standard (QS) for asthma which was published in February 2013.(2)

Key recommendations from BTS/SIGN guidance *(NICE QS in italics where applicable)*

Diagnosis

- When assessing children for a potential diagnosis of asthma, focus on key features in the history and examination and consider alternative diagnoses – stratify the likelihood of asthma as high, intermediate or low probability and document the reason for this clearly

Supported Self Management

- Offer children with asthma self-management education, and offer parents/carers education on managing their child's asthma. Include a written personalised asthma action plan (PAAP) *(Box 1)* and support this with regular professional review *(at least annually)*
- Give patients (and parents/carers) written PAAPs before discharge; this should be done by healthcare professionals with expertise in providing asthma education *(Box 1)*
- Assess adherence to long-term asthma treatment regularly; every clinical encounter presents an opportunity to do so *(Box 2)*

Non Pharmacological Management

- Advise parents and children who smoke about the consequent danger to their children and themselves, and offer support to stop
- Support weight loss in overweight patients; this may lead to improved symptoms
- Offer breathing exercise programmes such as the Papworth and Butyeko techniques (often physiotherapist delivered) as an adjuvant to pharmacological therapy; these may improve quality of life and reduce symptoms

Pharmacological Management

- Consider inhaled corticosteroids if ongoing symptoms are problematic or frequent, or if there has been an asthma attack in the last two years. Give these twice a day and increase as necessary – there is no benefit from starting at high dose with subsequent reductions
- When adding second line preventer therapy to inhaled corticosteroids:
    - Give a long acting β2 agonist to children aged 5 years or older
    - Give a leukotriene receptor antagonist to children younger than 5 years
- Use metered dose inhalers with a spacer for inhaled drugs, with a face-mask until the child can breathe reproducibly using the spacer mouthpiece; where this is ineffective a nebulizer may be required
- Give children and parents training on the use of these devices, and ensure they demonstrate satisfactory technique *(Box 2)*

Acute Asthma

- Give oxygen to children with life-threatening asthma or oxygen saturations <94% to achieve normal saturations of 94–98%
- Give inhaled short acting β2 agonists as the first line treatment for acute asthma attacks
- Give oral steroids early in acute asthma attacks in children older than 2 years, and consider these early for severe asthma attacks in children under 2 years
- Notify the child's primary care practitioner (ideally a named individual responsible for asthma care) within 24 hours of discharge following an asthma attack. *(Patients should be followed up by their GP within 2 days of being treated in hospital or out of hours services for an acute asthma attack)*

Difficult Asthma

- Evaluate patients with difficult asthma (existing diagnosis of asthma with asthma-like symptoms, but persistent attacks despite high-dose asthma therapy) to confirm the diagnosis, identify mechanisms of persisting symptoms, and assess adherence to

therapy. *(Offer patients with difficult asthma an assessment by a multidisciplinary difficult asthma service)*

Underlying evidence base

The evidence for this guidance is reviewed for each iteration, and the full details of updated topics and search strategies are in the guideline and on the SIGN website. A systematic literature review was done in accordance with SIGN methodology, including searches of databases and websites. Prior to inclusion as evidence, each paper was evaluated by two members of the guideline development group using SIGN methodological checklists. This evidence was used to formulate final recommendations, though in the absence of evidence consensus was reached, and the group presented recommendations for future research.

What do I need to know:

What should I stop doing?

- Stop promoting any physical or chemical means of house dust mite removal for primary or secondary prevention
- Stop offering advice on pet ownership as a means of primary prevention. There is no guidance on secondary prevention
- Stop considering the use of subcutaneous or sublingual immunotherapy

What should I start doing?

- Use 'asthma attack' instead of 'asthma exacerbation' – this is more understandable and emphasises the need for immediate action in line with other potentially life-threatening conditions
- Ensure all children and/or parents and carers have a written PAAP *(Box 1)*
- Ensure your organisation has an asthma care pathway which includes details on bronchodilator usage, clinical assessment and discharge criteria

What can I continue to do as before?

- When considering a diagnosis of asthma stratify this as high, low or intermediate likelihood. Focus on the key features which increase or reduce the probability, including respiratory symptoms and general patient characteristics. If the probability is high start asthma treatment; where it is low consider other diagnoses. If it is intermediate offer a trial of asthma treatment if there is evidence of airway obstruction on spirometry, or if spirometry is not tolerated; if there is no airway obstruction consider other diagnoses.

- Recommend smoking cessation for parents and children who smoke, and support weight management for overweight or obese patients
- Monitor height and weight annually
- Follow current stepwise management of asthma to optimise interval symptoms and prevent asthma attacks, with regular review of adherence
- Use inhaled salbutamol as first line treatment in asthma attacks coupled with early administration of oral steroids, add ipratropium bromide every 20-30 minutes for the first two hours in severe attacks
- Utilise each healthcare encounter as an opportunity to review and monitor asthma symptoms and treatment *(Box 2)*

Unresolved controversies

There are a number of areas in which this guideline has been unable to provide definitive and/or detailed recommendations as the evidence is lacking or imprecise. In acute severe asthma the most pressing area for research is to determine which intravenous therapy (salbutamol, aminophylline, or magnesium sulphate) should be used as the first line agent, and at which dose. It has been suggested elsewhere that this choice should be pragmatic at present, taking into account factors such as ease of prescription, preparation and administration, availability of high dependency beds, and nursing preference.(3) This and other international guidance suggests considering addition of 150mg nebulised Magnesium Sulphate to each dose of inhaled therapy in the first hour of treatment of severe asthma, especially in children with hypoxia (saturations <92% in air) and a short duration of symptoms (<6 hours). This is derived from the MAGNETIC study (4) which showed non-clinically significant benefit other than in the specific population identified, though this is being further explored by other studies which are currently recruiting patients. This also leads to further questions including what constitutes maximal inhaled bronchodilator therapy, and whether any existing assessment tools for acute asthma are meaningful to clinicians and families. A usable assessment tool could be helpful to develop asthma attack risk stratification tables, which may facilitate communication between patients and healthcare professionals and result in better standardised core outcomes.

Several other areas provoke perennial debate and require further attention. Two Australasian studies are currently examining the role of oral steroids in pre-school wheeze, and recent studies have examined the effectiveness of dexamethasone as an alternative to prednisolone. The use of sub-dissociative doses of ketamine in extremis, and of adrenaline

in cases where anaphylaxis may be a possibility, appear to merit further exploration. Recent work in bronchiolitis which demonstrated the safety of lower oxygen saturation targets should make us question whether thresholds for supportive intervention in asthma require modification. Finally, non-invasive ventilation is a therapeutic option which has divided opinion, but the advent of high flow nasal cannula therapy and its uptake for multiple respiratory diseases now make this an area urgently in need of further research.

Critique

Asthma remains the commonest chronic medical condition of childhood, and is consequently a significant cause of unscheduled or emergency healthcare attendance and hospitalisation. It still carries significant morbidity and mortality, and so documents such as the international consensus on pediatric asthma (ICON), global strategy for asthma management and prevention (GINA), NICE Quality Standards, and this BTS/SIGN guideline are welcomed by clinicians and patients. These aim to present recommendations to improve asthma care based on best available evidence, but there are several areas in which the evidence base is small or absent. This inevitably leads to variation in practice throughout the asthma pathway, as demonstrated in recent work from Paediatric Emergency Research in the UK & Ireland (PERUKI) (5) (6) in which the greatest variations were at the severe end of the spectrum; multiple dosages and regimes for IV therapy were a key finding, though variation also existed in inhaled and oral therapies, assessment, and other supportive therapies. These variations can and should be used to inform the future research agenda in childhood asthma, but it is also essential to consider what we could be doing better today, especially given the striking variation in admission rates and length of stay evidenced in the NHS Atlas of Variation in Healthcare. (7) While we should aim to implement the latest research findings such as those from the MAGNETIC study, it is also helpful to consider other simple measures. In order to better understand circumstances surrounding asthma deaths and identify avoidable factors the National Review of Asthma Deaths (NRAD)(8) was performed in 2013; this identified 28 children who died of an asthma attack in one year, of whom only 4 had been provided with a written PAAP. This is congruent with the most recent BTS childhood asthma audit(9), in which only 53% of children received a written PAAP at discharge, and 50% had their inhaler technique checked. Perhaps then this is the area where all health professionals can make the biggest immediate impact – by putting aside extra time to spend with patients and families to review and discuss all the factors of a well rounded asthma care package. *(Box 2)*

References:

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8. National Review of Asthma Deaths | Royal College of Physicians [Internet]. 2013 [cited 2014 Nov 28]. Available from: https://www.rcplondon.ac.uk/projects/national-review-asthma-deaths

9. James Paton. British Thoracic Society Paediatric Wheeze/Asthma audit report 2013 [Internet]. British Thoracic Society; 2014 [cited 2016 Feb 16]. Available from: https://www.brit-thoracic.org.uk/publication-library/bts-reports/

Boxes, tables, figures

Resources for childhood asthma

- Link to full SIGN guideline: https://www.brit-thoracic.org.uk/document-library/clinical-information/asthma/btssign-asthma-guideline-2014/
- Link to SIGN quick reference guide: https://www.brit-thoracic.org.uk/document-library/clinical-information/asthma/btssign-asthma-guideline-quick-reference-guide-2014/
- Link to NICE Quality Standard for asthma (QS25): https://www.nice.org.uk/guidance/qs25/chapter/list-of-quality-statements
- Link to "Why asthma still kills" – the National Review of Asthma Deaths (NRAD): https://www.rcplondon.ac.uk/projects/outputs/why-asthma-still-kills
- Link to Disease Management Information Toolkit: http://atlas.chimat.org.uk/IAS/dmit
- Link to Asthma UK resources for health professionals: https://www.asthma.org.uk/sites/healthcare-professionals
- Link to Asthma UK resources for families: https://www.asthma.org.uk/advice/resources/#one

Clinical bottom line

- Asthma continues to be one of the most prevalent long-term conditions in childhood and adolescents
- Long-term management involves a strong emphasis on supported self management with the provision of Personalised Asthma Action Plans (PAAPs)
- PAAPs should be reviewed at every clinical encounter alongside review of drug and lifestyle adherence to ensure good asthma control and prevention of asthma attacks
- Acute management continues to rest on the prompt delivery of inhaled or nebulised β2 agonists and oral or intravenous corticosteroids with several adjunctive intravenous therapies

Box 1: What to include in a written personalised asthma action plans (PAAP)

Features associated with beneficial outcomes including reduced emergency healthcare use and improved asthma control are:

- Specific advice on how to recognize loss of control of asthma symptoms
    - This should be symptom based in younger children
    - This may include peak flow measurement in older children (based on percentage personal best, not predicted)
- Two to three specific action points to take if asthma control deteriorates such as:
    - What to do with reliever inhalers (eg salbutamol) as regards dose and frequency
    - Whether to increase inhaled corticosteroids
    - When to start oral steroids
    - When to seek emergency help (eg if symptoms not controlled with 10 puffs of reliever given four hourly)

A good example of a written PAAP can be downloaded from the Asthma UK website: https://www.asthma.org.uk/advice/manage-your-asthma/action-plan/

Box 2: Asthma related factors which should be routinely monitored and recorded

- Check at every clinical encounter
    - Inhaler technique
    - Possession and use of a PAAP, and understanding of symptoms
    - Interval symptoms, frequency of attacks, oral steroid use and time off school/nursery due to asthma symptoms
    - Adherence to prescribed treatment
    - Exposure to tobacco smoke
    - Asthma attack triggers
- On discharge from unscheduled care
    - Consider the need to start or increase preventer treatment
    - Arrange a primary care appointment within 48 hours
    - Arrange follow up in a paediatric asthma clinic in one to two months
    - Arrange follow up with a paediatric respiratory specialist if life-threatening features present
- Additional items to be checked at planned reviews
    - Height and weight centiles