

The 'unified airway': the RCPCH care pathway for children with asthma and/or rhinitis

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ABSTRACT

Aims The Royal College of Paediatrics and Child Health (RCPCH) Science and Research Department was commissioned by the Department of Health to develop national care pathways for children with allergies: the asthma/rhinitis care pathway is the third such pathway. Asthma and rhinitis have been considered together. These conditions co-exist commonly, have remarkably similar immuno-pathology and an integrated management approach benefits symptom control.

Method The asthma/rhinitis pathway was developed by a multidisciplinary working group and was based on a comprehensive review of evidence. The pathway was reviewed by a broad group of stakeholders including the public and was approved by the Allergy Care Pathways Project Board and the RCPCH Clinical Standards Committee.

Results The pathway entry points are defined by symptom type and severity at presentation. Acute severe rhinitis and life-threatening asthma are presented as distinct entry routes to the pathway, recognising that initial care of these conditions requires presentation-specific treatments. However, the pathway emphasises that ideal long term care should take account of both conditions in order to achieve maximal improvements in disease control and quality of life.

Conclusions The pathway recommends that acute presentations of asthma and/or rhinitis should be treated separately. Where both conditions exist, ongoing management should address the upper and lower airways. The authors recommend that this pathway is implemented locally by a multidisciplinary team (MDT) with a focus on creating networks. The MDT within these networks should work with patients to develop and agree on care plans that are age and culturally appropriate.

INTRODUCTION

There has been a dramatic increase in the prevalence and severity of asthma in childhood, which has been mirrored in atopic eczema and allergic rhinitis.^{1–6} Indeed, there is a common progression between infancy and adulthood from atopic eczema and food allergy to rhinitis and asthma.⁷ Many children with asthma have concomitant rhinitis and failure to manage rhinitis effectively can compromise asthma control with consequences for quality of life.^{8–9} This has led to the concept of the 'unified airway', which

proposes that upper and lower airway disease are both manifestations of the same IgE-dependent eosinophilic inflammatory process. It is therefore reasonable to consider respiratory allergy as a disorder of the whole airway. This has therapeutic implications, since treating upper airway disease may improve lower airway symptoms. There has been a succession of management guidelines for asthma and rhinitis, both nationally and internationally, and many are now evidence based.^{10–21} Despite this, morbidity and, indeed, mortality have not decreased appreciably. It is possible that this is a consequence of a failure to deliver the management strategies in a consistent and timely fashion.

It was estimated in 2000 that the cost of asthma to the UK health service was £754 million, of which 79% related to prescribed medications, 13% to general practitioner consultations and 8% to hospital admissions, (emergencies, in particular).^{22–23} While it is difficult to disentangle the relative costs of children compared with adults, it is clear that children contribute proportionately more, both to primary and secondary care costs, with admission rates being significantly higher in this group per head of population.²⁴

Economic evaluations fail to take account of the education and support required to optimise medications or the cost of consumables, such as nebulisers, spacers and peak flow meters. Moreover, the indirect costs to the patient and their families are not considered. These relate to school non-attendance, work loss of their carers and frequent visits to health professionals. Furthermore, the long term impact of asthma on patient education, qualifications and career attainment are substantial, but poorly quantified.²⁵ Finally, none of the health economic studies have taken account of allergic comorbidities. Many children with asthma have associated allergic rhinitis and have had, or continue to have, atopic eczema. These place additional burdens on the child and family.

Asthma

Asthma is characterised by recurrent wheezing. It may be associated commonly with episodes of coughing, particularly at night. However, cough alone in the absence of wheeze is most often not due to asthma. Additional symptoms include

chest tightness and breathlessness on exertion, particularly when outdoors in cold weather. Acute asthma exacerbations are almost invariably associated with intercurrent viral respiratory infections, especially rhino-virus.²⁶ However, the child with persistent asthma may also wheeze in response to a range of triggers, including exercise, emotion, exposure to irritant dust and fumes, and cold or dry air. Symptoms can vary according to season and are often worse at night, disturbing sleep. While deaths from asthma in childhood are uncommon, there does appear to be a seasonal allergic cause with increased risk of sudden death between April and August.²⁷ This suggests that awareness of allergic status and intensification of asthma prophylaxis during high allergen exposure periods are required.

Rhinitis

Rhinitis is a highly prevalent, yet underappreciated, inflammatory condition of the nasal mucosa, characterised by itching, sneezing, rhinorrhoea and nasal congestion.²⁸ In children the two major forms are allergic and infective (predominantly viral infections) and there is evidence that these combine to trigger asthma exacerbations and perpetuate poor asthma control.²⁶ Other important conditions such as cystic fibrosis, primary ciliary dyskinesia, primary immune deficiency and choanal atresia may present as rhinitis in children and demand early diagnosis.¹⁶

Allergic rhinitis (AR) is mediated by early and late phase hypersensitivity responses, similar to those in allergic asthma,²⁹ to indoor and outdoor environmental allergens. Both allergic and non-allergic rhinitis are risk factors for the development of asthma.³⁰ This is important as early diagnosis and secondary prevention of progression from rhinitis to asthma may be possible.³¹ Conversely, many patients with allergic and non-allergic asthma have rhinitis.¹² Asthma and rhinitis frequently co-exist in the same subjects throughout the world, with evidence that asthma is more prevalent, and less well controlled in those patients who have persistent and severe rhinitis.^{12 32–35}

Rhinitis causes bothersome practical problems and affects well-being.³⁶ It has a global negative impact on health-related quality of life parameters in children and adolescents with impairment of physical function and learning.³⁷ Children in the USA miss approximately 2 million school days per year because of AR.³⁸ They may be unable to take part in family or social events, resulting in emotional disturbances that manifest as anger, sadness, frustration or withdrawal. UK GCSE examination performance is worsened by hay fever, particularly if sedating antihistamines are used.²⁵

METHOD

The full methodology is outlined separately in this supplement.³⁹

RESULTS

The results of the pathway development are presented in four parts: evidence review, mapping, external review and core knowledge documents. The full pathway can be downloaded from <http://www.rcpch.ac.uk/allergy/asthmarhinitis>.

Evidence review

A total of 331 titles and abstracts were screened by the project manager and the Asthma/Rhinitis Working Group (ARWG) chair (figure 1). Forty-eight systematic reviews and/or primary papers and 16 guidelines were identified for appraisal; hand

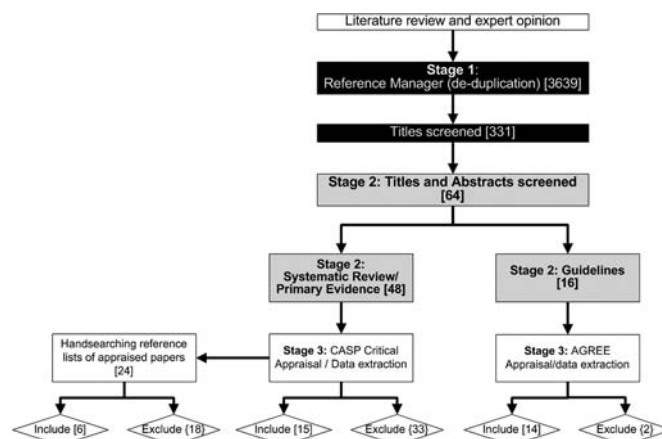


Figure 1 Methodology of evidence review.

searching the reference lists of appraised papers identified a further 14 papers. The critical appraisal resulted in the inclusion of 21 systematic reviews and/or primary papers and 14 clinical practice guidelines.

The evidence review suggested the value of written asthma plans, with symptom-based asthma plans being superior to peak-flow based plans.^{40 41} The importance of community-based home interventions⁴² for asthma was clear and there was a demonstrated value for the education of patients,^{43 44} parents, siblings^{45 46} and schools⁴⁶ in improving care. The benefits of house dust mite (HDM) reduction efforts for patient outcomes were inconclusive.⁴⁷

Allergic rhinitis is underdiagnosed and so undertreated. Allergic rhinitis should be treated with second generation, non-sedating antihistamines and intranasal steroids.⁴⁸ The impact of rhinitis on reducing examination performance was clear.²⁵

Sublingual immunotherapy (SLIT) is likely to benefit children with both allergic rhinitis and asthma.⁴⁹ Patients with rhinitis who are sensitised to HDM, grass pollen, parietaria, olive, ragweed, cat, tree and cupressus may benefit from SLIT.⁵⁰ Children with asthma who are monosensitised to HDM might benefit from HDM SLIT.⁵¹

A full evidence table can be obtained from the Royal College of Paediatrics and Child Health (RCPCH) website.

Mapping of the pathway

The national care pathway for asthma/rhinitis can be downloaded at <http://www.rcpch.ac.uk/allergy/asthmarhinitis>. This pathway was developed around the competences required to diagnose and optimally manage asthma and/or rhinitis.

The ARWG defined asthma as:

A condition that is characterised by the presence of one or more of the following symptoms – chest tightness, wheeze ($\pm$ cough), breathlessness, and in the absence of an alternative diagnosis. Asthma is associated typically with chronic inflammation and hyper-responsiveness of the lower airway leading to airway narrowing that is variable and reversible (by treatment or spontaneously).

The ARWG agreed the definition for rhinitis to be:

A condition that is characterised by the presence of two or more of the following symptoms, for more than one hour per day on a recurrent or persistent basis: rhinorrhoea (watery, runny nose), sneezing, bilateral

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nasal obstruction (congestion), itching ($\pm$ conjunctivitis). Rhinitis may be accompanied by symptoms affecting the eyes, ears, sinuses, throat and chest.¹²

The scope of this pathway does not extend to acute severe rhinosinusitis and the management of this condition is not considered. Acute severe rhinosinusitis is characterised by the sudden onset of two or more symptoms, one of which should be either nasal blockage/obstruction/congestion or thick nasal discharge, accompanied by facial pain/pressure, and/or reduction or loss of smell and/or headache. Acute severe rhinosinusitis can be life threatening: if high fever and displaced globe are present urgent secondary care referral is warranted.

External review

Fourteen of 56 invited organisations responded, providing 68 comments. All comments were reviewed by the ARWG and the pathway was approved by the Allergy Care Pathways Project Board and the RCPCH Clinical Standards Committee.

Core knowledge documents

The core knowledge documents relating to this pathway are as follows:

- ▶ British Thoracic Society/Scottish Intercollegiate Guidelines Network guideline on the management of asthma¹¹
- ▶ National Institute for Health and Clinical Excellence guidance on inhaled corticosteroids and inhaler devices^{52 53}
- ▶ British Society for Allergy and Clinical Immunology (BSACI) guidelines for the management of allergic and non-allergic rhinitis¹⁶
- ▶ BSACI guidelines for the management of rhinosinusitis and nasal polypsis¹⁵
- ▶ European position paper on rhinosinusitis and nasal polyps.⁵⁴

DISCUSSION

A fundamental aim of the asthma and/or rhinitis (AAR) pathway is to demonstrate the role of allergy as a cause of airways disease since atopy underpins most asthma and rhinitis in childhood.⁵⁵ Also, as asthma and rhinitis frequently coexist,^{8 56 57} the pathway seeks to reinforce the concept of a whole airway approach for effective long-term patient care.

The points of entry to the AAR pathway are defined by symptoms at presentation. Recognition of these symptom complexes will be required in many community settings, as well as hospital emergency departments, assessment units and clinics. The challenge for this pathway was to formulate a joined-up approach to asthma and rhinitis care, while recognising that initial management differs when the child presents seriously unwell.

Acute presentations

Acute severe or life-threatening asthma is a medical emergency that requires distinct treatments in accordance with evidence-based guidelines.^{10–20} Accordingly, this emergency presentation is outlined separately in order to emphasise and recognise the key, disease-specific steps in initial management. While acute severe rhinosinusitis can be life-threatening in circumstances when there is evidence of systemic and/or locally invasive infection, we recognised that this presentation was outside the scope of an allergy care pathway. Nonetheless, many children present acutely with debilitating nose and eye symptoms and the pathway acknowledges a requirement for

urgent, systematic medical management in this circumstance through separate initial 'acute rhinitis' steps.

Once the seriously unwell child is stable, review of whole airway symptoms and their control is indicated, as reflected by a single pathway from this point. It places a responsibility on the emergency care practitioner to address underlying allergic issues at that time, where possible, including recognition and avoidance of potential ongoing environmental triggers (eg, environmental tobacco smoke,^{11 18 58–61} HDM,^{26 61–65} pets^{11 19 26}, eg, psychosocial factors⁶⁵) to acute deterioration.

Non-acute presentations

Asthma and rhinitis are the most common chronic diseases among children in the UK.⁶⁷ They have far-reaching consequences for a child's general health and well-being, and impact on school attendance and performance, as well as normal sporting and exercise activities.^{19 25 66} With this in mind, the pathway emphasises the pressing need for 'initial recognition', as this is the first step on the ideal patient care journey. Health professional recognition and management are supported by a number of evidence-based documents, which constitute core reference material for this pathway.

Patient management is characterised by a package of care that broadly includes steps to establish a definitive diagnosis, initiate appropriate treatments and provide ongoing education. Throughout 'ongoing management', these steps are reviewed, amended and/or supported accordingly. The pathway focus on a 'unified airway' facilitates recognition of shared allergic triggers, inter-related symptoms and treatments, where an integrated approach may improve patient symptom control while minimising treatment-related side effects.

Allergy is a multisystem disorder⁶⁸ and other allergic conditions might present similarly to AAR and/or compound the well-being of patients with asthma/rhinitis. Thus, this document signposts the user to the relevant partners in the RCPCH care pathway portfolio.

Patient–health professional partnership

The success of this work is dependent on the engagement of patients and their carers as well as health professionals. A particular strength of this pathway was that a young adult patient representative and a representative from a national patient support charity were able to contribute to the document at all stages. The pathway emphasises that all treatment and management plans should be achieved in partnership between patients with allergies, their carers and health professionals (concordance). Moreover, schools, colleges and early years settings (EYS) are pivotal to supporting day to day adherence to the management plan, or indeed, providing information on symptoms that might drive review of the plan. Thus, liaison with educational facilities is a key item on the pathway. Concordance, or the agreement between the patient/family and health professional to follow a particular strategy, should be clearly established at the outset and the health professional should continue to assess adherence to the joint agreed plan.⁶⁹

Clinical implications

The AAR pathway does not define where (or by whom) care should be provided, but rather describes the competences required by the relevant health professional(s) to deliver optimal care.

Management should be tailored to the individual's requirements and based on severity, triggers and age.^{70 71} Thus,

for example, 'complex management' is defined by the skills required to reassess poorly controlled symptoms, which may require further specialised investigation and treatment. It is independent of conventional 'primary' versus 'secondary' versus 'tertiary' care terminology, although practically some specific treatments (example, anti-IgE therapy for asthma) are likely to be restricted to specialist centres.

The goals of treatment must be to return the patient to a normal lifestyle with participation in all usual activities. This is possible in many, but not all, cases. Decisions about therapeutic strategy must be based on an understanding of the natural history of the disease and its various manifestations, as well as the age-related pharmacokinetics of drug treatments. The health professional must also appreciate the complexities of the patient in their own environment and should be equipped to give appropriate support to families.⁷²

These competences utilise an evidence base to summarise the required knowledge and skills for the particular pathway step. While the competency-based model offers improved flexibility for high quality allergy care provision, it has a number of implications for clinical services. Health professionals need time for these detailed patient contacts. Also, they must feel assured, and be able to demonstrate competence at the levels outlined in the pathway steps and this is likely to require input to, and revision of, training programmes. Moreover, at the heart of a successful pathway is effective communication between all involved health professionals, and between health professionals, patients, carers and community services (schools, colleges, EYS). Opportunities for training, as well as systems to address communication and patient follow-up (including transitional care) needs will require broader National Health Service support and resources if we are to provide the ideal pathway of care our children deserve.

Conclusion

The asthma and rhinitis pathway describes the steps in ideal care for children presenting with acute (emergency and urgent) and non-acute airway symptoms. Used in conjunction with the other papers in the Allergy Care Pathway portfolio, it represents an opportunity to improve the lives of children with allergies in our community.

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