

## Optimising treatment of allergic rhinitis in children

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## FIGURE 1

A child with typical  
features of allergic  
rhinitis – allergic  
shiners, Morgan  
Denny's folds, nasal  
crease and dry lips



**ALLERGIC RHINITIS (AR)  
AFFECTS AROUND ONE IN  
FOUR INDIVIDUALS OVER  
THEIR LIFETIME. HOWEVER,**

its burden is rarely appreciated and treatment is often poorly prioritised. UK paediatric prevalence data from the International Study of Asthma and Allergies in Childhood (ISAAC) cross-sectional survey has shown that 10.1% of children aged six to seven and 15.3% of those aged 13–14 years report symptoms of allergic rhino-conjunctivitis in the past 12 months.<sup>1</sup>

Acute and chronic symptoms can disrupt school and leisure activities, significantly reducing quality of life. These symptoms often impair sleep,

resulting in tiredness and poor concentration. A consequence is that children with seasonal allergic rhinitis

## Table 1

### Typical features of allergic rhinitis

- Nasal blockage
- Clear nasal discharge
- Sneezing
- Nasal itching
- Ocular itching
- Red nasal turbinates
- Sleep interference
- Responds to regular oral antihistamines and nasal steroids

**What** are the  
typical features  
of allergic rhinitis?

**How** should  
symptoms  
be managed?

**When** should  
immunotherapy  
be considered?

perform significantly worse in summer exams, relative to their mock exam results, when compared with their peers.<sup>2</sup> Those individuals showing most symptoms are also likely to be affected by other allergic diseases, magnifying the detrimental impact on quality of life.

## SYMPTOMS

Nasal blockage is the most common complaint associated with chronic AR, with acute exacerbations causing sneezing, clear nasal discharge and itchy eyes, see table 1, left, following exposure to the relevant airborne triggers. AR may usually be distinguished from infectious causes through its »

association with itchy eyes and clear nasal discharge.

Upper airway symptoms may be caused by a multitude of inflammatory and obstructive disorders, many of which may present alongside AR in children, see table 2, below. To manage these symptoms optimally, the correct cause or balance of factors must be identified.

## **‘A holistic unified airway approach in allergic respiratory disease optimises both allergic rhinitis and asthma outcomes’**

### **ATOPY**

Atopy, a predisposition to allergy, is inherited. The immune systems of atopic children manufacture immunoglobulin E (IgE) capable of recognising specific allergens. In children with AR, IgE specific to inhaled allergens is bound to the surface of mast cells and basophils. When exposed to the relevant environmental allergen, these IgE molecules cross link and cause the cell to degranulate, releasing histamine

and other immune mediators which result in immediate itching, sneezing and mucus production. These early phase mediators recruit eosinophils and T-cells to the nasal mucosa, resulting in swelling and nasal engorgement.<sup>3</sup>

The Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines propose a stepwise approach to the management of AR.<sup>4</sup> Guidance was developed to determine patients’ severity of AR, and algorithms designed (see box 1 and box 2, p15).

More specifically, allergen avoidance measures should be instituted according to seasonal or perennial

symptomatology, guided by allergy testing, alongside nonsedating antihistamines such as cetirizine or loratadine. Continued symptoms should be treated with regular intranasal steroid spray. Anti-leukotrienes should be considered early in children presenting with multi-trigger wheeze.<sup>4</sup>

A holistic unified airway approach in allergic respiratory disease optimises both AR and asthma outcomes. Asthma admission rates in children with hayfever increase with higher pollen counts.<sup>5</sup> However, appropriate rhinitis treatment with nasal steroids or antihistamines can reduce the number of visits to A&E and

**FIGURE 2**

Pale swollen inferior turbinate with a narrowing of the nasal airway

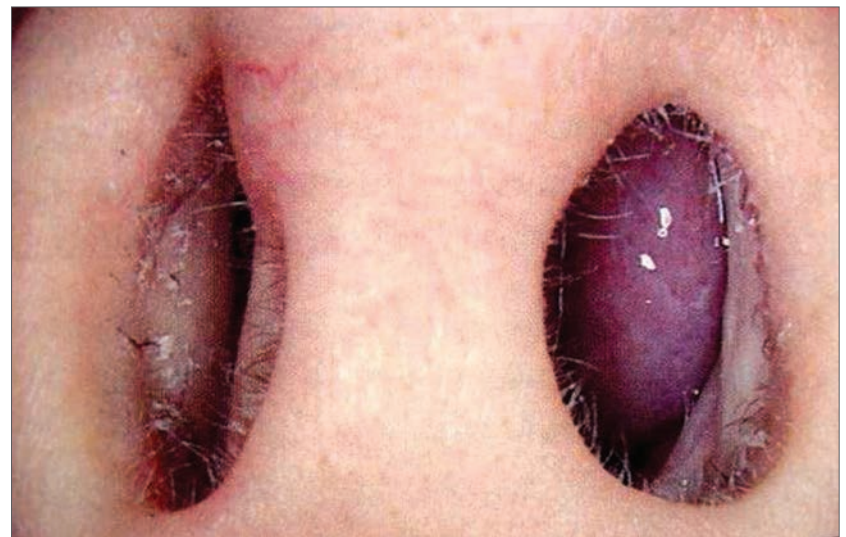


**Table 2**

### **Differential diagnoses for upper respiratory tract complaints in children, in likely order of increasing age of child**

| Differential                  | History                                                                                                     | Signs                                                                                                                                    |
|-------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Tonsillar hypertrophy         | Snoring, nasal speech                                                                                       | Mouth breathing, hypertrophy/kissing tonsils                                                                                             |
| Foreign body in young child   | History or accessibility to small objects                                                                   | Visualise. To remove: parent blows through other nostril with closed glottis                                                             |
| Glue ear                      | Hearing loss, perforation                                                                                   | Middle ear effusion                                                                                                                      |
| Acute/chronic rhino-sinusitis | Purulent discharge, headache, posterior discharge/drip/cough                                                | Tender sinuses, purulent discharge, responds to antibiotics                                                                              |
| Allergic rhinitis             | Nasal blockage with itchy eyes, sneezing and coughing, worsening with environmental triggers                | Mouth breathing, allergic salute, nasal crease, allergic shiners, Morgan Denny’s folds, red nasal turbinates, responds to nasal steroids |
| Multi-trigger wheeze = asthma | Coughing or difficulty in breathing in the evenings/mornings, on exertion, in cold air or allergen exposure | Wheeze on auscultation, poor peak flow or air entry                                                                                      |
| Nasal polyps                  | Nasal congestion with possible loss of sense of smell, cystic fibrosis or aspirin hypersensitivity          | Polyps (pale, mobile, boggy and insensible) and possible signs of cystic fibrosis (weight loss, chesty cough and salty sweat)            |
| Obstructive sleep apnoea      | Snoring with episodes of apnoea, wakeful nights, sleeping in day                                            | No specific signs                                                                                                                        |
| Septal deviation              | Likely history of trauma                                                                                    | Deviated septum or cherry haematoma (check patency)                                                                                      |

hospital admissions for wheeze.<sup>6</sup>

Temporal patterns of rhinitis exacerbation give clues as to the most important aeroallergens implicated, see table 3, below. Seasonal AR, or hayfever, occurs when levels of allergens (tree pollens, grass pollens, weeds or fungi) are elevated. In the UK, tree pollen allergy predominates throughout the spring, whereas those affected by grass pollen allergy may find their symptoms increasing over the summer months.

## 'Dust mite sensitisation is also an early hallmark of developing other allergic disorders, especially later asthma'

In contrast, perennial AR symptoms are the result of exposure to house dust mites, animals and moulds. Children who are allergic to these often find the winter more troublesome as they spend more time indoors and the central heating regularly disperses these household allergens.

Advice on avoidance will depend on specific triggers, see table 4, p17. It is important to note that children with perennial and fluctuating symptoms may well be allergic to both pollens and dust mite allergens, demonstrating acute on chronic exacerbations over the warmer months.

### CASE ONE

*An eight-year-old boy is brought into your surgery by his mother, describing alternating nasal discharge and congestion even between viral upper respiratory tract infections.*

*The symptoms are particularly troublesome over the winter, in warm environments and in the evenings, with constant nasal congestion, tickling cough and rubbing of his eyes and skin. He often sneezes repeatedly on waking.*

*You note that you have previously prescribed a salbutamol inhaler when he was unwell with a viral upper respiratory tract infection. On further questioning, his mother reports that he does not cough or get short of breath*

*outside the house. However, his nose streams clear fluid when he visits his grandparents' house and his symptoms were particularly marked during a recent stay in a hotel.*

*He rubs his nose throughout the consultation and on examination he has mild facial eczema, allergic shiners, Morgan Denny's folds and visible nasal crease, see figure 1, p13. He speaks* »

### Box 1

#### Classification of allergic rhinitis according to ARIA guidelines<sup>4</sup>

##### Intermittent symptoms

- < 4 days a week or
- < 4 weeks

##### Persistent symptoms

- ≥ 4 days a week and
- ≥ 4 weeks

##### Mild symptoms

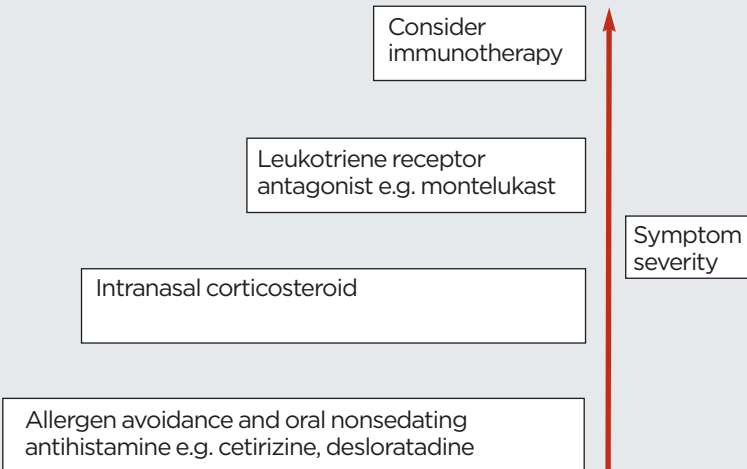
- Normal sleep
- Normal daily activities, sports and leisure
- Normal schoolday
- No troublesome symptoms

##### Moderate/severe symptoms

- One or more of:
- Abnormal sleep
  - Impairment of daily activities, sports and leisure
  - Problems at school
  - Troublesome symptoms

### Box 2

#### Stepwise management of allergic rhinitis adapted from ARIA guidelines<sup>4</sup>



### Table 3

#### Distinguishing seasonal from perennial aeroallergen exposure

| Type of AR | Aeroallergen     | Time of year                               |
|------------|------------------|--------------------------------------------|
| Seasonal   | Trees            | Spring (March–June)                        |
|            | Grasses          | Summer (April–September)                   |
| Perennial  | Dust mite        | All year (symptoms may be worse in winter) |
|            | Mould spores     | All year (symptoms may be worse in winter) |
|            | Domestic animals | All year (symptoms may be worse in winter) |

with a hyponasal voice. On inspection of his nasal cavity with an auriscope, he has pale and enlarged turbinates on both sides, see figure 2, p14.

### Discussion points

House dust mite allergy commonly causes perennial AR. Dust mite sensitisation is also an early hallmark of developing other allergic disorders, especially later asthma, in accordance with the Allergic March, see figure 3, below.

It will be important to continue to screen him with questions regarding multi-trigger wheeze when he re-presents to your practice.

**Avoidance measures:** This boy may benefit from dust mite avoidance measures see table 4, opposite. While researchers continue to debate whether this should be offered systematically to all sensitised patients, clearly there are children who demonstrate such considerable

symptoms from dust exposure that a focused trial of dust allergen reduction measures may demonstrate significant clinical improvement.

**Antihistamines:** Regular morning and evening antihistamines are an important step in managing his pervasive symptoms. Sedation can largely be avoided by using second- or third-generation antihistamines; cetirizine, loratadine, desloratadine or levocetirizine.

As cetirizine has a good safety

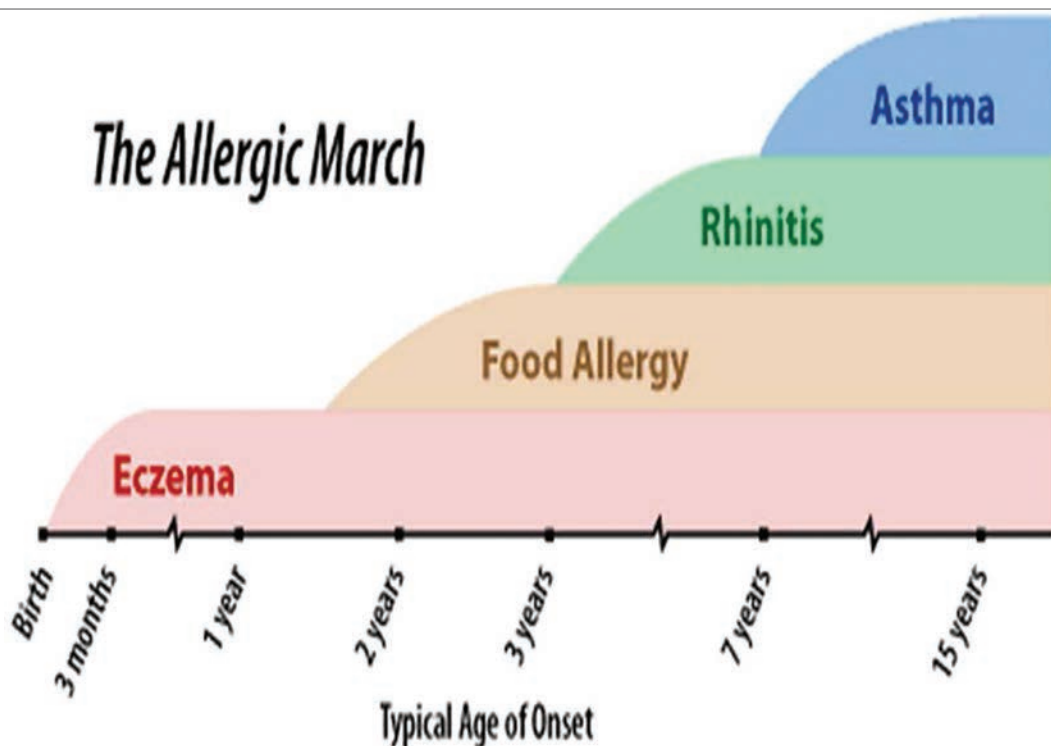


**FIGURE 3**

The Allergic March: the common temporal progression of allergic diseases



Clear the nose and tilt head forward



Hold the spray in the opposite hand to the nostril in which you are about to apply the spray. (Shown here, right hand for left nostril)



Place the end of the spray bottle just inside the nostril aiming up and back towards the side wall of the nose. Activate the spray without sniffing. (Change hands and repeat this action in the other nostril)

**FIGURE 4**

Steps for administration of nasal spray, as recommended by the British Society for Allergy and Clinical Immunology<sup>7</sup>

Table 4

**Standardised advice for dust avoidance in accordance with the British Society for Allergy and Clinical Immunology**

These recommendations progress from easy measures to more involved steps, which should be applied to the household where possible. Subjects may respond at differing levels of avoidance.

**Step 1: Reduction of dampness**

- Open windows and ventilation in kitchens and bathrooms after cooking and bathing
- Avoid drying clothes indoors
- Air bedding before remaking beds
- Run central heating a few degrees lower

**Step 2: Prevent dust build up**

- Use enclosed storage for clothes
- Restrict areas where dust may settle, e.g. cabinets and wardrobes
- Regularly wipe surfaces where dust settles with a damp cloth
- Regularly wipe window blinds
- Vacuum soft furnishings and carpets, replacing collection bags regularly
- Vacuum mattresses every two weeks

**Step 3: High temperature washing**

- Choose fabrics which sustain washing at 60°C which will kill dust mites
- Wash bedding fabrics at 60°C every two weeks
- Wash curtains at 60°C

**Step 4: Bedding and soft toys**

- Replace pillows with new ones every six months
- Replace blankets with duvets made of synthetic material
- Cover all dust sensitised child's mattresses, duvets and pillows with microporous membrane covers and wipe clean when bedding changed
- Reduce number of soft toys around bed area
- Put soft toys in freezer once per month for six hours to kill dust mites

**Step 5: Carpets**

- Replace carpets with linoleum/vinyl flooring or cork/wood boards without cracks
- Choose short pile synthetic carpets
- Wash rugs at 60°C

**Step 6: High efficiency vacuum cleaners**

- Consider buying a high efficiency vacuum cleaner for floors, carpets, soft toys and furnishings

**Step 7: Replace home furnishings**

- Replace woven seat covers and material sofas with cane, canvas and leather-like covers

record in children over six months of age, this tends to be our first choice, usually once daily.

**Nasal sprays:** Children with persistent symptoms despite first-line treatment require a nasal steroid spray, in addition, to reduce their chronic nasal congestion.

Nasal sprays containing a combination of nasal steroid and antihistamine (azelastine hydrochloride and fluticasone propionate) have recently received a licence for patients from 12 years of age and data on their effectiveness is very encouraging.

Parents often ask whether steroid use may risk limiting their child's growth potential. Whereas intramuscular and oral corticosteroids are established as risk factors for growth limitation, long-term follow-up studies with nasal sprays such as once daily fluticasone furoate, mometasone, beclometasone and budesonide show no impact on growth, making these the best choice.

Decongestants are known to cause vasoconstriction of the nasal blood vessels thereby decreasing nasal congestion. However, their use should be limited to three to five days at a time because of the rebound congestion effect (rhinitis medicamentosa) which follows longer regular use.<sup>8</sup>

This patient's eye symptoms may best be controlled using an eye drop preparation such as olopatadine although nasal sprays also have a positive effect on conjunctival symptoms.

**Indications for immunotherapy**

Where continuing deterioration presents a challenge and allergic symptoms remain uncontrolled, patients should be referred to a specialist allergy service to be considered for immunotherapy.

**CASE TWO**

*A 13-year-old boy comes with his father to your practice, describing symptoms of nasal blockage, itchy eyes and coughing. He has stopped playing cricket in the summer and is starting to take the bus to school rather than cycle because he can no longer see when making his way through the local park. His morning antihistamine chlorphenamine did not seem to be working and so he had stopped taking it.*

*He was previously prescribed a salbutamol inhaler for viral-induced exacerbation of asthma, however stopped using his beclometasone because he felt it afforded no benefit. He currently coughs when running around and uses his salbutamol three*

*to four times on an average schoolday. He requests repeat prescription for the salbutamol every two months over the summer season.*

*On examination, he mouth breathes during the consultation and has swollen red nasal turbinates with mucus on nasal inspection, see figure 2, p14. He has no added sounds on his chest today, although his peak flow is on the low side for his athletic build. His father wishes him to have allergen immunotherapy to cure his allergies, which he had received as a child himself, because he was hoping to compete for the county cricket side.*

**‘Sublingual immunotherapy is a relatively new development with proven efficacy and a good safety profile’**

**Discussion points**

**Antihistamines:** Many children take sporadic chlorphenamine because of its ease of availability over the counter. However, it remains a poor choice beyond the nursery years because of its sedating effect in children who often already have sleep disturbance. In this case, a regular nonsedating antihistamine should be instituted along with a nasal steroid spray because of the extent of his symptoms.

**Inhaler technique:** This young man has a history of poorly controlled asthma and requires an assessment of his inhaler technique. Beclometasone, at least 200 µg/day, is likely to be required for adequate asthma control, and should be prescribed alongside salbutamol and a spacer device. The difference in technique required for nasal and inhaled steroid devices should be carefully explained, see figure 4, opposite.

**Immunotherapy:** Insufficient improvement in AR symptoms with long-acting antihistamines and regular nasal steroid application necessitates referral to a specialist centre, especially where asthma is causing further impact. By gauging his response to therapy around the »

## key points

### SELECTED BY

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### Allergic rhinitis (AR) affects around one in four individuals

over their lifetime. A survey has shown that 10.1% of children aged six to seven and 15.3% of those aged 13–14 years report symptoms of allergic rhino-conjunctivitis in the past 12 months. Children with AR perform significantly worse in summer exams, relative to their mock results, when compared with their peers. Those individuals showing most symptoms are likely to be affected by other allergic diseases. Nasal blockage is the most common complaint associated with chronic AR, with acute exacerbations causing sneezing, clear nasal discharge and itchy eyes following exposure to the relevant airborne triggers.

### Allergen avoidance measures should be instituted

according to seasonal or perennial symptomatology, guided by allergy testing, alongside non-sedating antihistamines such as cetirizine or loratadine. Continued symptoms should be treated with regular intranasal steroid spray. Anti-leukotrienes should be considered early in children presenting with multi-trigger wheeze.

### Temporal patterns of exacerbation give clues as to the

most important aeroallergens implicated. In the UK, tree pollen allergy predominates throughout the spring, whereas those affected by grass pollen allergy may find their symptoms increasing over the summer months. In contrast, perennial AR symptoms are the result of exposure to house dust mites, animals and moulds. Children who are allergic to these often find the winter more troublesome as they spend more time indoors and the central heating regularly disperses these household allergens.

### With dust mite allergy, a focused trial of dust allergen

reduction measures may demonstrate significant clinical improvement. Children with multiple system involvement often require a nasal steroid spray in addition to antihistamines. Long-term follow-up studies with recent nasal sprays such as once daily fluticasone furoate, mometasone, beclomethasone and budesonide show no impact on growth. Decongestants are known to cause vasoconstriction of the nasal blood vessels thereby decreasing nasal congestion. However, their use should be limited to three to five days at a time because of the rebound congestion effect.

### Where continuing deterioration presents a challenge

and allergic symptoms remain uncontrolled, patients should be referred to a specialist allergy service to be considered for immunotherapy. Subcutaneous immunotherapy became increasingly widespread over the course of the 20th century and various studies have demonstrated its efficacy in both adults and children. Sublingual immunotherapy is a relatively new development with proven efficacy and a good safety profile.

age of 13 years, immunotherapy may be instituted in time to gain some relief before taking his exams at 15 to 16.

The practice of administering gradually increasing doses of allergen extract in order to reduce the symptoms associated with subsequent exposure dates back to 1911. Subcutaneous immunotherapy (SCIT) became increasingly widespread over the course of the 20th century and various studies have demonstrated its efficacy in both adults and children.<sup>9</sup>

It has been suggested that it also has the potential to modify the course of disease and protect against development of new sensitisations as well as asthma.<sup>10</sup>

Sublingual immunotherapy (SLIT) is a relatively new development with proven efficacy and a good safety profile.<sup>11</sup> It has been found to reduce symptoms and use of medication in children with seasonal allergic rhinitis.<sup>12</sup> Formulations for grass pollen, have now been licensed for children, however treatments for tree pollen, dust mite and pet allergens are also available for use in the UK. SLIT has an excellent safety record in children over two years of age with only mild adverse reactions reported.<sup>13</sup>

The sublingual route only requires the first dose to be supervised and is more convenient for younger patients. However, this reliance on self-administration does raise the issue of adherence, which is likely to influence efficacy. There are currently no head-to-head trials comparing relative efficacy of subcutaneous versus sublingual immunotherapy regimens.

At present, immunotherapy is generally only available through specialist clinics.

## CONCLUSIONS

AR carries an under-recognised morbidity and often relates closely to common childhood disorders. Careful history taking is the most important tool in distinguishing causes of nasal symptoms and addressing the correct line of treatment.

Treatment involves allergen avoidance, where possible, together with long-acting, non-sedating antihistamines. Courses of nasal steroids should be prescribed where there is insufficient relief with antihistamines and allergen avoidance.

Specialist care should be involved in cases where nasal steroid spray is inadequate, particularly in cases of comorbid allergic disease and

for assessment of suitability for desensitisation.

Optimal AR management in primary care substantially alleviates this chronic condition in most children.

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## Useful information

The British Society for Allergy and Clinical Immunology  
[www.bsaci.org](http://www.bsaci.org)

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