

Allergic rhinitis

Other separate articles related to this topic include [Non-allergic Rhinitis](#), [Nasal Polyps](#), [Sinusitis](#) and the general article [Rhinitis and Nasal Obstruction](#).

Description^[1]

Allergic rhinitis is a common problem which affects work performance, sleep and school attendance. Allergic rhinitis is the most common chronic disease in childhood. Undertreated allergic rhinitis impairs quality of life^[2]. It is a risk factor for the development of asthma and may contribute to poor asthma control^[3].

Allergic rhinitis may be categorised into:

- **Seasonal allergic rhinitis/hay fever:** this occurs at certain times of the year. When due to tree pollen or grass it is known as hay fever. Other allergens include mould spores and weeds.
- **Perennial rhinitis (persistent):** this occurs throughout the year. Allergens commonly include house dust mites and domestic pets.
- **Occupational rhinitis:** symptoms occur due to exposure to allergens at work (eg, flour, wood dust, latex gloves).

Pathogenesis

Allergic rhinitis is a common condition characterised by an immunoglobulin E (IgE)-mediated inflammation of the nasal mucosa following exposure to allergens. This gives rise to a release of preformed mediators (of which histamine appears to be the most important) and chemotactic factors from the mast cells in the nasal mucosa. There is a subsequent increase in epithelial permeability and this prompts migration of inflammatory cells to the area:

- **Acute-phase response (minutes):**
 - Sneezing occurs within minutes of exposure, due to stimulation of afferent nerve endings.
 - Increase in nasal secretion follows shortly afterwards, to peak 15-20 minutes after contact with the allergen.
- **Late-phase response (6-12 hours):**
 - Characterised by nasal obstruction (although some of the acute symptoms may persist).

Epidemiology^[4]

- Allergic rhinitis is a common problem, affecting over 20% of the UK population^[5].
- School-aged children and adolescents are more likely to have seasonal allergic rhinitis, whereas adults tend to have persistent allergic rhinitis^[1].
- Peak onset is in children and adolescents, with 80% of those with allergic rhinitis being diagnosed before the age of 20.
- Allergic rhinitis is a common condition in children and becoming more prevalent. In the UK, 10% of 6- to 7-year-olds have the condition, and 15-19% of 13- to 14-year-olds. For most, it will persist into adulthood.
- True prevalence is unknown on account of the high number of unreported, self-medicating patients.
- One American study found that 50-70% of all allergic rhinitis patients may also be suffering from non-allergic rhinitis. The authors termed this 'mixed rhinitis'^[6].

Aetiology

There appear to be both genetic and environmental factors contributing to the development of allergic rhinitis. The most common allergen for perennial rhinitis is the house dust mite, followed by allergens carried by the hair on cats and dogs. There may be associations with other conditions:

- Conjunctivitis – more common in intermittent disease.
- Atopy (including eczematous dermatitis and asthma) – more common in persistent disease.
- Rhinosinusitis and nasal polyps^[7].
- Risk factors include history of atopy and a family history of rhinitis or atopy.

Presentation^[1]

Seasonal rhinitis tends to occur in the spring or summer. A clue to the allergen can be obtained from the timing of symptoms. Tree pollen tends to cause rhinitis in early to late spring. Grass pollens usually cause symptoms from late spring to early summer and weed pollens from early spring to early autumn.

House dust mite-induced rhinitis is worst on waking and occurs all year round (although may be more severe in autumn and spring). Animal hair allergens provoke symptoms after exposure and occupational symptoms will be worse at work, improving on days off or during holidays.

Symptoms

Whilst taking a history, establish the answers to the following questions:

- What is the main symptom?
- How long has the condition been present?
- How frequent and severe is it?
- Is it seasonal or perennial?
- Are there trigger factors – allergic or non-allergic?
- Is there exposure to allergens through occupation or hobbies?
- Does the patient have history of asthma, eczema, rhinitis?
- Is it drug-induced or food-induced? Remember that topical sympathomimetics, some antihypertensives, aspirin and non-steroidal anti-inflammatory drugs may cause rhinitis symptoms.

- Is it better when not at work? Holiday time remission suggests an environmental cause.

Typical symptoms:

- Sneezing.
- Rhinorrhoea and nasal congestion:
 - This may be either anterior or posterior, leading to postnasal drip.
 - Clear - infection unlikely
 - Unilateral - is uncommon - cerebrospinal fluid (CSF) leak should be excluded.
 - Yellow-coloured implies allergy or infection.
 - Green-coloured is usually associated with infection.
 - Blood-tinged unilateral - tumour, foreign body or nose picking.
 - Blood-tinged bilateral - bleeding points, nose picking or granulomatous disorder.
- Itchy nose and/or palate.
- Symptoms tend to be bilateral, and worse on waking.
- Usually associated symptoms in the eyes, with watering, itching, redness or swelling.
- Symptoms are controlled by antihistamines or topical nasal steroids.

NB: patients with unilateral symptoms, especially if they have pain, visual disturbance or bleeding, should be referred to an ear, nose and throat specialist.

Examination

- Ear, nose and throat surgeons examine the nose with a head mirror or headlight and a nasal speculum, supplemented by rigid or flexible nasendoscopy.
- In general practice, the nose can be examined with an auriscope fitted with the largest speculum.
- The nasal mucosa looks swollen and greyish.
- Look for signs suggestive of chronic nasal congestion - mouth breathing, cough, halitosis.
- Examine eyes for signs of conjunctivitis.
- Rule out other associated conditions.
- Cranial nerve examination should be done to exclude rare tumours^[4].

Differential diagnosis

- [Non-allergic rhinitis](#).
- [Infective rhinitis](#).
- [Nasal polyps](#).
- [Sinusitis](#).
- Adenoidal hypertrophy.
- [Cystic fibrosis](#).
- [Kartagener's syndrome](#).
- [Systemic lupus erythematosus](#) and granulomatous conditions - eg, [granulomatosis with polyangiitis](#) and [sarcoidosis](#).
- Consider [foreign bodies](#) in the young child.
- Deviated nasal septum.
- Other causes of nasal obstruction.
- Leaking of CSF will present with watery rhinorrhoea, often unilateral. It is usually associated with trauma (including surgical trauma) or neoplasia. However, spontaneous leaking may occur.

- Nasal neoplasms are rare; the diagnosis should be considered in patients with unilateral symptoms of nasal obstruction, pain or bleeding.

Investigations

History and examination should be sufficient to make the diagnosis. However, additional allergy testing may be helpful when the causative allergen is not clear.

Skin prick test

- Skin prick testing is reliable and gives immediate results^[8]. When combined with clinical history it has a positive predictive value of 97–99% for allergic rhinitis.
- Be aware that results can be suppressed by antihistamines, topical corticosteroids and tricyclic antidepressants.

Blood assays

- When skin prick tests are not available or the patient is taking antihistamines or has dermatographism, total and allergen-specific IgE concentrations in the blood may be determined by radioallergosorbent test (RAST) or enzyme-linked immunosorbent assay (ELISA).

If this is inconclusive, the list of differentials should be considered.

Objective measures of nasal airway

These are not made in routine clinical practice but can be useful when allergen or aspirin challenges are undertaken and may be helpful when septal surgery or turbinate reduction is being contemplated. They include peak nasal inspiratory flow, acoustic rhinometry and rhinomanometry.

Computerised tomography scan

This is indicated when medical treatment has failed, the diagnosis of chronic rhinosinusitis is suspected and could not be confirmed on history and examination, or neoplasia is suspected.

Management^[1]

The majority of patients with allergic rhinitis symptoms can be treated in primary care, using a stepwise approach according to the severity of symptoms^[9].

The main lines of treatment are education, allergy avoidance, antihistamines and topical steroids^[10].

The British Society for Allergy and Immunology advises referring the patient to an allergy clinic once all available therapeutic options have been exhausted. The decision as to when to refer should be based on clinical judgement after discussion with the patient/parent/carer^[5].

General principles

Treatment strategy is guided by the degree of disruption caused by symptoms; the basic principle is to avoid the causative allergen. Allergen avoidance should be advised for people with:

- Pollen allergy.
- Animal allergy.
- Occupational allergic rhinitis.
- House dust mite allergy (where symptoms remain uncontrolled despite maximum treatment and allergy has been confirmed by tests).

For those with pollen allergies, advise avoidance of exposure to open grassy spaces, keeping windows shut in cars and buildings and regular servicing of car pollen filters where these are present.

For animal allergies, the animal should not be allowed in the house if possible, or should be restricted to the kitchen only.

Perennial allergic rhinitis is most commonly associated with allergy to house dust mite. A Cochrane systematic review examined whether effective reduction of mite levels was achieved with avoidance measures. Many trials were of poor quality but it was found that the use of acaricides and extensive bedroom-based environmental control programmes may be of some benefit. Isolated use of house dust mite impermeable bedding was unlikely to be effective^[11]. Therefore, extensive house dust mite avoidance strategies are not worth investing in unless treatment is failing. If needed, advise:

- House dust mite-impermeable covers for mattresses and pillows.
- Use of synthetic pillows.
- Use of acrylic duvets.
- Keeping soft toys off the bed.
- Washing all bedding at least once a week at a high temperature.
- Use of wooden or hard floor coverings rather than carpets where possible.
- Use of fitted blinds rather than curtains where possible.

Medical treatment

Topical nasal antihistamines

- First-line for 'as-required' treatment, other than for children aged 2-5 or for those who prefer oral treatment.
- They have equal efficacy to oral antihistamines for rhinitis symptoms^[12]. However, they do not reduce symptoms at other sites - eg, the eyes.
- They are fast-acting (less than 15 minutes) so are a useful 'rescue'.
- Should not be used for children under the age of 5.

Oral antihistamines

- Regular therapy is more effective than 'as required'.
- Used where sneezing or nasal discharge is a predominant symptom and regular preventative therapy is required.

- Once-daily, non-sedating antihistamines such as cetirizine, loratadine or fexofenadine are recommended.
- Loratadine may be used in pregnant or breastfeeding women if intranasal corticosteroids are not tolerated or effective.
- Cetirizine and loratadine are licensed from the age of 2 and are the antihistamines of choice for children up to the age of 12.

Topical intranasal steroids

- More effective than antihistamines for nasal obstruction^[13]. Therefore, they are useful when the predominant symptom is a feeling of nasal blockage, or where nasal polyps are present. Effective for all symptoms of allergic rhinitis in addition to nasal obstruction, including itching, sneezing and watery rhinorrhoea.
- Onset of action is slower than for nasal antihistamines. Maximal efficacy may take some days or weeks to develop.
- Nasal sprays are preferable to drops.
- First-line treatment for pregnant or breastfeeding women with allergic rhinitis.
- Modern intranasal steroids are safe for long-term use in adults when used within the recommended dosage.
- Mometasone and fluticasone are licensed for children from the age of 6, although the European Academy of Allergy and Clinical Immunology recommends their use from the age of 2^[12].
- In children, they should be used at the lowest dose that controls symptoms, particularly when used concurrently with inhaled steroids^[14]. Beclometasone has a worse safety profile than mometasone, budesonide or fluticasone and should be avoided in children^[5].
- A Cochrane review concluded that in children it is not worth adding oral antihistamines to intranasal steroids as the risks outweigh the benefits^[15].
- Occasionally, intranasal steroids may be associated with dryness, crusting or slight bleeding, which, if recurrent, may necessitate withdrawal of treatment.

Others

- Nasal saline washouts are a safe effective alternative which may reduce the need for intranasal steroids^[16].
- A combined azelastine/fluticasone nasal preparation has been shown to be more effective than either agent alone^[13].
- Sodium cromoglicate is less effective than antihistamines and corticosteroids and needs frequent use (up to five times daily), which may compromise compliance.
- The anticholinergic intranasal agent ipratropium bromide is effective in controlling watery rhinorrhoea, particularly if this is the dominant symptom. The dose may need to be titrated against symptoms. It should be used with caution in those at risk of closed-angle glaucoma.
- The oral antileukotriene, montelukast, has been shown to be effective in allergic rhinitis, particularly when combined with an oral antihistamine^[17]. However, their role and extent of benefit is uncertain and they are not recommended for initiation in primary care. They may be particularly helpful in those with co-existent asthma.
- Topical nasal decongestants may be useful at the start of treatment to 'open up' the nose and should be used for a maximum of seven days to avoid the risk of developing 'rhinitis medicamentosa'. Topical decongestants should not be used for pregnant women or for children under the age of 6.
- Oral steroids may be used in very short courses for severe symptoms impairing quality of life, whilst waiting for preventative longer-term treatment to take effect. (Prednisolone for 5-10 days. 20-40 mg per day in adults, 10 mg per day in children.

Surgical treatment

When drugs fail and a structural abnormality exists, surgery may be indicated:

- Surgical reduction of the inferior turbinates or correction of a deviated nasal septum or nose may be needed to improve the airway or at least to improve access for topical medical treatment^[18].
- Surgery has a role in the management of nasal polyps and sinusitis when these conditions fail to respond to medical treatment, particularly with the advent of minimally invasive endoscopic sinus surgery.

Immunotherapy^[19] ^[20]

Where pharmacotherapy fails, allergen-specific immunotherapy should be considered^[2].

Immunotherapy involves desensitisation - exposing patients to increasing amounts of allergen with the aim of inducing immunological tolerance. Identifying the allergen trigger is essential for this strategy.

Sublingual and subcutaneous therapies exist for use by specialist teams. Evidence shows the sublingual route to be as effective and better tolerated^[21] ^[22]. Treatment is usually given for three years. It can be used from the age of 5.

Complications^[1] ^[23]

- Poor quality of life. Symptoms of allergic rhinitis can impair quality of life, having an adverse effect on work performance, social life, sleep, school attendance and learning.
- Poor **asthma** control. Allergic rhinitis is a major risk factor for poor asthma control.
- **Sinusitis**.
- **Nasal polyps**.
- **Chronic otitis media** .

Prognosis^[1]

This condition often improves over the years - particularly seasonal allergic rhinitis, which may spontaneously resolve in up to 20% of patients.

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