Factsheet

# Allergy and eczema

Allergic conditions including food allergy, eczema, asthma and allergic rhinitis (commonly known as 'hay fever') are rising, affecting one in four people in the UK. They also include reactions to specific allergens such as medicines and insect stings.

## What is an allergy?

An allergy is an immune response to a protein, which are found in things like pollen, animal dander, house dust mite, wasp or bee venom, medicines, cosmetics and chemicals. When some people are exposed to one or more of these proteins, they may become 'sensitised' and vulnerable to an allergic reaction. The body may then develop symptoms on re-exposure to that same allergen, causing a mild, delayed or potentially unsafe allergic reaction.

Allergies can be broadly divided into two groups: those causing immediate reactions and those causing delayed allergic reactions.

## Immediate allergy

Immediate allergic reactions commonly occur within 30 minutes of exposure to an allergen but can take up to two hours. Immediate allergies are also known as 'IgE-mediated allergies' because they are driven by the IgE (Immunoglobulin-E) antibody. When exposed to the relevant allergen, this IgE antibody latches on to the allergen and triggers allergy cells to release histamine and other mediators that cause a reaction.

The rapid onset of symptoms after exposure to an allergen may indicate:

- A mild reaction: hives (nettle rash), skin swelling (eyelids or lips), rapid-onset itching, sneezing or vomiting.
- Anaphylaxis (impact on someone's breathing or circulation) which in very rare cases may become life-threatening. Can also include: coughing, wheezing, breathing difficulty, chesty sounds, hoarse voice, dizziness, drowsiness or loss of consciousness.

There are some common patterns of IgE-mediated 'immediate' allergies, which may need to be assessed and confirmed by a clinical professional.

- Primary food allergies usually develop in childhood and may cause unsafe reactions if enough of the food is eaten, although they can develop before the specific food is eaten. The chance of reaction can be measured through assessing levels of specific IgE to that food. The most common food allergies in childhood are to egg and cow's milk, both of which can resolve in time, and nuts and fish, which are less likely to resolve. Pea and legume allergy are also becoming more common. Around 7% of babies, 4% of school-aged children and 2% of adults have primary food allergies. A small proportion of affected people have had airway or circulatory reactions to these foods, or have risk factors for these more serious reactions, and may benefit from being prescribed adrenaline devices like an EpiPen.
- Pollen-food-syndrome (also called Oral Allergy Syndrome) may develop in people who have hay fever. This is because their immune system already makes IgE antibodies that latch on to pollen proteins, and there are similar pollen-shaped proteins in apples, stoned fruit, carrots, celery and some nuts. Usually, the hay fever develops first, and some people later experience oral symptoms when eating some of these foods. In this case, the proteins are not absorbed into the blood and the risk of an unsafe allergic reaction is low. People with pollen-food-syndrome are not usually prescribed adrenaline devices.

## Immediate allergy continued...

Immediate allergies to things in our environment may be seasonal, for example, pollen in spring/summer, or induce symptoms all year around, for example house dust mite.

These ongoing environmental allergens can induce allergic rhinitis, allergic asthma, repeated episodes of hives or eczema which commonly affects exposed areas such as the arms, lower legs, face and neck.

**Table 1: Signs of eczema and urticaria**

| Eczema | Urticaria (hives) |
|---|---|
| • More likely to develop gradually<br>• Persistent – usually days/weeks<br>• Intense itching, especially when eczema flaring<br>• Dry skin, red or darker patches of eczema, which may weep<br>• More commonly affects flexural areas (body creases) but can be anywhere on the body<br>• Skin may ooze or crust, fissures (cracks) and rough area (lichenification) can form from itching<br>• Chronic and recurs, triggered by irritants and allergens<br>• May coexist with asthma or hayfever<br>• After an eczema flare, skin can become darker or lighter (post inflammatory changes) and usually remain dry | • Develops suddenly<br>• Short lived – usually minutes/hours – up to 24 hours<br>• Itching less intense and only with hives<br>• Raised red wheals (round circles) with borders, unlikely to weep<br>• Anywhere on the body, but wheals appear and disappear, leaving clear skin<br>• No scaling, oozing or crust or long-term skin changes<br>• Comes and goes, often triggered by allergens<br>• May be accompanied with angioedema (swelling of eyelids, lips and throat)<br>• Skin returns to normal, with no changes or dryness |

**NOTE: Some people may experience eczema and urticaria**

## Delayed allergy

Delayed allergic reactions (also referred to as non-IgE-mediated allergies) are harder to diagnose as they may take hours, days or weeks for symptoms to come on. These are driven by (T-) cell immune-driven responses and can cause very different symptoms according to the allergen and body system affected.

- Non-IgE Mediated Cow's Milk Allergy: During infancy, a baby may develop symptoms such as vomiting, diarrhoea, several days of blood in the stool or eczema if the baby consumes cow's milk protein. This usually resolves within a year of first showing symptoms. In cases where breastfeeding is difficult, the baby does not have a milk alternative, or there are difficulties in the baby gaining weight, then it is important to seek medical advice through your GP.

- Food Protein Induced Enterocolitis Syndrome ('FPIES'): Babies may vomit for several hours and then develop diarrhoea after their first tastes of specific foods such as grains (rice, oats), cow's milk or soy milk, eggs, fish, fruit or vegetables. If the vomiting is accompanied by the baby becoming floppy, less responsive and pale, it is important to seek urgent medical care. Normally, babies are only affected by one food in this way, however around one fifth may have to avoid more than one food. In most cases, this condition resolves in a couple of years.

- Allergic Contact Dermatitis: Children and adults may develop sore, red and dry areas of skin, which persists for days and can lead to the skin cracking and splitting. Common contact allergens include jewellery, cosmetics and creams, preservatives, nail varnish, fragrances, hair dye and chromate in concrete.

Some people may suffer from both IgE-mediated and non-IgE-mediated food allergies.

## Mimics of allergy

Many other conditions also cause signs like allergic reactions.

Eczema affects around 1 in 5 children and 1 in 10 adults in the UK. People with atopic eczema have dry skin, which in turn makes itching and inflammation more likely, resulting in cycles of periodic eczema flare-ups. It can therefore appear that flares are caused by environmental allergen exposure, but we know eczema flares can also be caused by:

- Viral illnesses

- Physical skin irritations such as playing in sand, sea water, perfumes and skin cosmetics

- Products that dry the skin, such as soaps, bubble baths and detergents

- Irritation of pre-existing sore eczema, such as babies coming into contact with tomato, strawberry and other acerbic foods around the mouth.

Lactose intolerance is not an allergy, because lactose is not a protein and it is not driven by IgE antibodies. Lactose is the natural sugar carbohydrate found in mammalian milks, and most commonly found in fresh cow's milk and yogurt, although only in some cheese products. Lactose intolerance only ever causes bloating and diarrhoea, and cannot induce eczema flare-ups, vomiting or any other symptoms.

In the UK, it is usually temporary and lactose can be re-introduced into the diet again after a month or so of abstinence, to see if symptoms re-occur. It is not possible to have an unsafe reaction from lactose intolerance, and it can only be diagnosed by taking a history of symptoms on exposure, avoidance, and re-exposure again with relevant foods.

Infants commonly experience colic, reflux and vomiting, abdominal distention and symptoms of distress, all of which worsen with viral illnesses, and are not necessarily due to allergy.

Mothers who breastfeed may be concerned that their own diet may be inducing their baby's symptoms, although this is very unusual. Breastfeeding mothers should not restrict their diet without medical advice to do so. For example, only 1mg (0.001grams) of cow's milk protein can ever be passed on through a whole breastfeed, so the chance of a mother's cow milk consumption causing eczema or colic in a baby is extremely low.

## Who gets allergies?

Babies who develop eczema in the first few months of life have an increased risk of developing food allergy. Our skin is a protective barrier and keeps bacteria, viruses and allergens out of the body. Those with eczema have a less effective skin barrier function and are more likely to experience eczema flare-ups after contact with irritants and detergents, and with viral illnesses. They are also more likely to develop allergen sensitisation through exposure to foods in their environment. When caring for a baby's eczema, it is therefore really important to wash your hands before applying any skin creams, treatments or massage oils. We believe this will reduce the risk of babies becoming sensitised to foods before they eat them for the first time.

We can help protect babies with eczema from developing food allergies. Numerous international research studies show that starting to introduce tastes of peanut butter and well-cooked egg into the diet, and building this into their regular weekly diet, protects babies from developing these allergies. The same logic is also likely to be true for cow's milk dairy foods and other nuts. Babies with eczema are more likely to be protected by having these foods introduced into their diet regularly. It is best to introduce each allergen one at a time, starting with peanut, egg and any other allergens regularly eaten in your household, and repeatedly offering these as part of the babies' diet.

## What can cause an allergic response?

The most common triggers of an allergic response are food, aeroallergens, and direct contact with substances. Milk and eggs are the most common food allergens in children, which are frequently outgrown in early childhood. Peanuts, tree nuts, sesame, soya, wheat, fish and kiwi fruit are also common food allergens. While many people are concerned that they may have symptoms that are caused by a food, in reality less than 5% of the population has a food allergy.

Respiratory symptoms such as asthma or hay fever (allergic rhinitis) are caused by aeroallergens such as tree and grass pollen, house dust mite droppings, or animal dander. These are much more common and affect up to 1 in 5 people.

A small number of people have allergic reactions to drugs and venom, such as bee and wasp stings.

We understand less about these allergies, as they occur in people who are not atopic (those with a predisposition to allergies). Also, having allergic disease does not put you at an increased risk of being allergic to stings or medication.

People can develop an allergy to a substance, through direct contact. This is called allergic contact dermatitis (for more information see the Eczema UK booklet Contact Dermatitis). As the name suggests, the reaction initially occurs on the areas of skin that come into contact with the allergen. As the allergen builds up, the inflammation can spread to other parts of the skin. Allergic contact dermatitis occurs when the body's defence mechanisms learn to recognise a substance and becomes sensitised to it.

**Table 2: Common allergic triggers (please note this list is not exhaustive)**

| Food (affects<5% of the Uk Population) | Aeroallergens (affect 1 in 5 of the UK population) | Direct contact |
|---|---|---|
| • Milk (CMPA)<br>• Eggs<br>• Peanuts<br>• Tree nuts<br>• Sesame<br>• Soya<br>• Wheat<br>• Fish/shellfish<br>• Kiwi fruit | • Grass pollen<br>• Tree pollen<br>• House dust mite droppings<br>• Animal dander | • Drugs<br>• Venom – bee and wasp stings |

## Who should seek medical support?

Many more people believe they have an allergy than show any objectively verifiable signs. It is therefore important to seek medical advice in situations where allergy is having a significant impact on you.

Consider seeking medical advice if:

- You have experienced an unsafe allergic reaction, involving coughing, wheezing, breathing difficulty, chesty sounds, hoarse voice, dizziness, drowsiness or loss of consciousness
- Your eczema treatment has been unsuccessful after using appropriate strength topical steroids for each eczema flare, and the skin is still itchy and sore
- There are seasonal swings of asthma or rhinitis, worsening through either pollen (spring-summer) or at other times (especially cold months)
- You have experienced asthma attacks needing hospital admission
- You avoid foods over concern of an allergic reaction, especially if there has been no obvious reaction to that food
- You are unsure if you have outgrown food allergy and whether it is safe to consume the food
- There is a likely impact on yours or your child's growth, development or emotional well-being

Babies should be assessed if:

- There has been a suspected reaction to a food
- Parents are avoiding certain foods because of suspected food allergy
- Your baby is gaining weight slowly (as defined by healthcare professionals as crossing two centile lines of growth) with signs of ongoing and possible allergic reaction.

Children should be assessed if:

- They are over four years old and foods are still being avoided for non-IgE food allergies, because most children should have outgrown these
- Family members, school or health professionals do not agree whether there are any allergies affecting health.

## How do I find out if I have an allergy?

An allergy assessment can be conducted by a healthcare professional who has experience of dealing with allergic disease and access to testing, and can include GPs, hospital doctors, nurses and dietitians. The first step of evaluation involves the healthcare professional understanding the patient's history, to ask why there are concerns about allergy, what exposures are considered safe and ask if exposure to the allergen happens all the time with the same symptoms.

You are encouraged to bring a record of suspected reactions, foods and products of concern with you to your consultation, as well as any photos showing the skin rashes.

Photos should focus on the area(s) of skin affected, ideally taken in natural bright sunlight to show signs clearly. Any records of previous assessments, test results or medications are also helpful.

Immediate allergies are diagnosed with an allergy-focused medical history and testing; delayed reactions can be harder to diagnose.

## Allergy testing: Immediate allergies

Three tests are commonly used in allergy clinics to diagnose immediate allergies: skin prick testing, specific IgE blood testing, and an oral food challenge.

**Skin prick test:** Skin prick testing (SPT) involves placing a drop of the suspected allergen or protein extract onto the skin. The allergen is introduced into the top layer of the skin, by pricking through the droplet with a 1mm lancet (like a needle). This will not hurt, or bleed – it is not like a blood test or an injection. This procedure is very safe and rarely causes more than an itch at the site of testing.

If the individual is sensitised to an allergen, they may develop an itchy bump (called a 'hive') and redness (or other colour change depending on skin tone) at the site of testing over the next 20 minute. The size of the bump is used to interpret the likelihood of someone having an allergic reaction to the protein being tested.

Taking antihistamine before the skin prick test may reduce the chances of the hive size accurately reflecting the likelihood of having an IgE-mediated allergy. Long-acting antihistamines (including 'second generation' medicines such as cetirizine, loratadine, desloratidine or fexofenadine) should be avoided for five days prior to skin prick testing. Short-acting antihistamines (such as chlorphenamine and hydroxyzine) can be used up until 48 hours before the allergy testing appointment. All eczema creams, asthma inhalers, nasal sprays and eye drops are not known to reduce the accuracy of skin prick testing and should be continued if prescribed.

**Specific IgE) testing:** (previously known as the RAST test) measures allergen specific IgE in the blood. You need to give blood sample, which is then mixed with the suspected allergen in a laboratory. It's likely you will have to wait one week or more for the results. Unlike SPT, taking antihistamine before the blood test does not affect specific-IgE results. Specific IgE blood testing provides a 'likelihood' of the allergy being present, unless the result is very high.

**Component specific IgE testing:** is a more specialist blood test that measures whether the specific IgE antibodies recognise and bind to the allergen that induces immediate allergic reactions. Some of these component tests are able to discriminate between primary food allergies and secondary pollen-food induced allergies, which are particularly important when deciding on appropriate management for nut allergies.

If the clinical history and IgE testing with medical interpretation does not provide sufficient information, an oral food challenge test may be needed to achieve an accurate diagnosis.

**Oral food challenge:** A 'provocation challenge' is used to achieve a definitive diagnosis of allergy and can be used to determine how much food allergen can be tolerated before a reaction develops. Patients are exposed to the allergen in hospital to see if an immediate reaction develops on exposure. An incremental food challenge involves offering a series of increasing steps of allergen and may indicate how much allergen it takes for symptoms to develop.

## Allergy testing: delayed allergies

Delayed non-IgE food allergies can only be investigated by taking someone's history, and food re-introduction where safe and appropriate.

**Elimination diet:** The suspected food is removed from your diet for a period of 4-6 weeks and then reintroduced for 2 weeks, to look for resolution or return of symptoms. This approach may be best supported with a dietitian, to ensure the allergen is not being consumed for the elimination period and a suitable alternative is used instead. This is particularly important in children whose growth may be affected if they do not receive the nutrients required for growth and development.

**Patch testing:** This type of testing is used for people who have skin reactions to chemical substances that come into contact with their skin, such as metals, cosmetics and toiletries. The test is looking for a delayed reaction to an allergen. The allergen, mixed with either paraffin or water, is placed on the skin, covered and then left for 48-72 hours.

Several different allergens can be tested at once and the solutions are applied in multiple small patches attached to adhesive strips, usually on a clear area of skin on the person's back.

Some of these strips can be related to occupation. There are, for example, hairdressers', bakers' and printers' strips. Once the strips are removed, the results are analysed. Some testing centres look at the skin again after another 48 hours for any further reaction.

Patch testing for foods is more likely to result in physical irritation reactions and need an expert to assess the impact. Patch testing for foods is not widely used and some experts question whether they are helpful.

**Other tests:** The tests described above are the only tests that have been extensively researched and proven to be reliable to diagnose allergy. Other tests are available, such as 'York testing' for IgG antibodies (which are not linked to allergic reactions), hair analysis and vega testing. These should be approached with caution.

## How can I treat my allergy?

The first step in managing and treating allergic disease is identifying the thing(s) you are allergic to. Once this has been established, the allergen should be avoided to ensure an allergic reaction does not occur. This is easier with food allergens, particularly since retailers are legally obliged to ensure that the 14 most common allergens are highlighted on food labelling.

In principle that sounds fairly easy; however, in practice it can be more difficult, and a dietitian will help guide you through this. The charities Anaphylaxis Campaign (www.anaphylaxis.org.uk) and Allergy UK (www.allergyuk.org) also provide information regarding the avoidance of food allergens.

## The 14 most common food allergens

- Celery
- Cereals that contain gluten (including wheat, rye, barley and oats)
- Crustaceans (including prawns, crabs and lobsters)
- Eggs
- Fish
- Lupin (lupins are common garden plants, and the seeds from some varieties are sometimes used to make flour)
- Milk
- Molluscs (including mussels and oysters)
- Mustard
- Tree nuts – such as almonds, hazelnuts, walnuts, brazil nuts, cashews, pecans, pistachios and macadamia nuts
- Peanuts
- Sesame seeds
- Soybeans
- Sulphur dioxide and sulphites (preservatives that are used in some foods and drinks).

While avoidance is the mainstay of managing allergic disease, it is essential to know how to manage an allergic reaction should this occur.

## Treating Immediate allergic reactions

Mild symptoms can be treated with antihistamines, which may help the symptoms of hives, itching, swelling, nausea, vomiting and nasal congestion.

Any signs of breathing difficulty or drowsiness indicate anaphylaxis and you need emergency medical care (call 999 straightaway). Any signs of coughing, wheezing, breathing difficulty, chesty sounds, hoarse voice, dizziness, drowsiness or loss of consciousness due to allergen exposure require urgent assessment, and adrenaline is the mainstay of treatment in this medical emergency.

If you have a food allergy and asthma, it is important you have two adrenaline devices with you at all times and have been shown how to use them (for children this would require a prescription for four devices – two to be kept at school and two to be carried with the child at home). This is because individuals with asthma are at an increased risk of having a severe allergic reaction.

Histamine is one of the mediators that are released during an immediate allergic reaction. Mild food allergic reactions, hay fever and urticaria, can be treated with antihistamine medication in the form of tablets or topical treatments. There is no evidence that topical and oral antihistamines can help the symptoms of eczema. However, sedating antihistamines can be useful (and are often prescribed) to help people sleep and prevent restless nights due to itch.

Steroids may also be required by some to manage their asthma, eczema or allergic rhinitis. Please see Eczema UK's Topical steroids factsheet.

## Longer-term treatments of immediate allergies:

Patients with allergic rhinitis to pollens, house dust mite or pet dander may have trouble sleeping or completing daily activities. Pollen and dust mite induced symptoms can disrupt the ability of individuals to leave the house, sleep or concentrate. Specialist immunotherapy medicines may enable patients to tolerate their environmental allergies better by reducing the impact of exposure. Allergen extracts are taken regularly to reduce the immune hyper-reactivitiy to environmental exposure and have a beneficial impact when taken every day for months at a time, and ideally for three years. There is limited treatment for this available through the NHS.

Patients with food allergy have to carefully avoid eating relevant allergens, because if they consume too much, they are likely to experience an allergic reaction. The amount of food needed to cause symptoms may be lower if you have a viral illness, are tired, have consumed alcohol or have an asthma attack at the time – these are called 'co-factors' and may make an immediate allergic reaction less safe.

For patients with access to specialist medical care, it may be possible to increase the threshold at which patients demonstrate signs of an allergic reaction for some food allergies. There is limited availability to access Oral Immunotherapy on the NHS and so far, only the oral peanut product has been formally licensed as a medicine in the NHS. Oral food immunotherapy is only conducted under close medical supervision, and involves consuming tiny, measured amount of the allergen daily with monitoring for each dose. The pathway is started in hospital, and the dose is increased under direct medical supervision every few weeks. There is an increased chance of developing immediate reactions to the allergen by undergoing this treatment, however patients who can achieve the target eventual maintenance dose are more likely to develop allergic symptoms if they accidentally eat the allergen in their routine diet.

## Useful resources

Allergy UK
Helpline: 01322 619864
Email: info@allergy.org
wwww.allergyuk.org

Action Against Allergy
020 8892 2711
www.actionagainstallergy.co.uk

Anaphylaxis Campaign
Helpline: 01252 542029
Email: info@anaphylaxis.org.uk
www.anaphylaxis.org.uk

This factsheet was co-written and clinically reviewed by Dr. Tom Marrs to ensure all information provided is accurate, up-to-date, and evidence based.

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Eczema UK is the UK charity for everyone affected by eczema. We help support people with eczema, providing information and advice, which we deliver through our website, publications and social media. We also provide a voice for people with eczema, raising awareness of the condition, supporting research into new treatments and campaigning for better medical care.

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**Factsheet last reviewed March 2026.**