



[Authoritative facts](#) about the skin from the [New Zealand Dermatological Society Incorporated](#).

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The causes of atopic dermatitis (eczema)

There is no known single cause for atopic dermatitis: it probably represents more than one condition. There are many theories regarding the underlying mechanisms. Current research is investigating the roles of the immune system, defects in the skin cells (keratinocytes), skin surface microbes (bacteria, viruses and yeasts), filaggrin gene mutations, and many other factors.

The immune system develops in the first six months of life. There is a generally an equilibrium of the two main types of T Helper lymphocytes (small white blood cells), TH-1 and TH-2. In atopic dermatitis there is often an imbalance, with far more TH-2 cells and their associated chemical messengers (cytokines). In some children there are also high levels of the antibody immunoglobulin E (IgE) antibodies and eosinophils (the white blood cells associated with allergy).

The skin cells seem to lose their barrier function so that water is lost from the skin and irritants can penetrate into it. Bacteria, yeasts and viruses on the skin surface can either cause eczema or provoke allergy.

These factors are influenced by the genetic make-up of the individual and with 'external' environmental factors contribute to the likelihood of developing eczema, its severity and its response to treatment.

The tendency to asthma, eczema and hay fever (atopy) is largely inherited (genetic). Atopy is characterised by an overactive immune response to environmental factors. This results in inflammation, redness and itching of the skin. The same factors have no effect on the skin of a non-atopic. Yet, despite their genetic background, some children from an atopic family never develop atopic dermatitis and children with no family history can suffer from it.

Very rarely, atopic dermatitis [may be due to an underlying inherited immune deficiency such as Job syndrome](#). In this disease, the dermatitis appears very soon after birth and is complicated by severe infections.

Atopic dermatitis is a disease of the whole body that manifests in the skin. Events that upset the body in other ways (such as viral infection, teething, eating certain foods) may have an effect on the atopic dermatitis. Flares of the condition seem to occur without provocation and can be very frustrating.

The following factors may cause an exacerbation of atopic dermatitis.

Dry skin

People with atopic dermatitis usually have a [dry skin](#). This is due to reduced water-holding capacity and loss of barrier function.

Factors that make the skin even drier can make the eczema harder to control:

- Winter weather
- Frequent washing particularly with very hot water
- [Soap](#) and antiseptics
- Low humidity
- High ambient temperatures
- Chlorine in swimming pools

Eczema is not a 'dirty disease'; a brief shower or bath once a day is enough for dry skin. However, your doctor may specifically recommend bathing for longer or more often during the acute blistered phase of eczema.

Regular use of an [emollient](#) helps skin retain moisture and combat dryness.

Irritants

Most people with eczema will notice that certain things seem to irritate their skin with immediate stinging or itching and may also cause a flare of eczema ([irritant contact dermatitis](#)). These are not allergies.

- Soap
- Harsh clothing detergents
- Wool against the skin
- Cosmetic and perfumes
- Prescribed and over-the-counter treatment creams
- Dusty environments

It is common sense to avoid the substances that irritate.

- Dilute washing powder: use as small amount as possible in each load and make sure the clothes are well rinsed out in fresh water.
- If you use soap to wash your hands, rinse off thoroughly.
- Wear gloves and covering clothing to protect against detergents, cleaning chemicals, solvents etc. at work and at home.
- Limit preparations applied to skin to those specifically prescribed for the eczema.

Infection

Antigen stimulation

Infective organisms play an important role in triggering and aggravating atopic dermatitis. Bacteria ([staphylococci](#) and [streptococci](#)) and yeasts ([malassezia](#) and [candida](#)) on the skin provide constant stimulation to the immune system resulting in chronic inflammation.

Bacterial infection

- People who have atopic dermatitis are particularly prone to skin infections. This is in part due to breaks in dry, split skin, from scratching and from diminished barrier function. They also seem to have a reduced ability to fight these common organisms.
- The bacteria that cause infection are also commonly found on healthy skin. The oil on healthy skin protects against invasive infection because the bacteria are lipophobic (literally 'afraid of fat'). Staphylococcal and streptococcal bacteria thrive and invade dry, atopic skin.
- As a result people with atopic dermatitis frequently suffer from boils, folliculitis and infected eczema. The infection causes the eczema to worsen and become more resistant to the usual treatment with emollients and topical steroids. Antibiotics are often required to eliminate the infection and control the eczema.

Viral infections

- [Herpes simplex](#) virus causes cold sores and genital herpes. It readily infects the skin of patients with atopic dermatitis and can rapidly spread to cause a severe infection known as eczema herpeticum (see [Complications of atopic dermatitis](#)).
- [Molluscum contagiosum](#) and [viral warts](#) also tend to be more numerous and persistent in those with atopic dermatitis.

Fungal infections

- Some adults have a flaky pattern of facial eczema which is related to infection with a yeast called *Malassezia furfur*. In these patients the eczema can improve with antifungal treatment.
- *Candida* (thrush) is also more likely to thrive in poorly controlled, moist areas of eczema.

Allergens

- There are many misconceptions and controversies regarding eczema and allergy, even within the medical profession. People who have atopic dermatitis associated with elevated IgE are likely to have allergies to food or environmental factors such as grass, cat dander and dust mites. However these allergies are often independent of their eczema, that is, even though the patient has a positive allergy test, exposure to the allergen does not directly affect the severity of the eczema.
- It is common for [prick tests](#) for allergy to be falsely positive in atopic individuals because of the extreme sensitivity of eczematous skin to any insult. The tests are done by scratching the skin with a small amount of a potential allergen such as cat dander. In people with eczema scratching the skin may cause a raised mark, i.e. a positive test result even without any allergen. This means the test is unreliable for diagnosing allergies in those with eczema.
- Blood tests (RAST) measure the level of specific IgE to different allergens. They also have a high false positive rate and may not reflect the allergen's effect on atopic dermatitis.
- If a true allergy is present AND exposure to the allergen results in a persistent worsening of the eczema, removal of the allergen from the affected patient's environment can result in improvement of the eczema.

Food allergies

Food allergies affect about a third of children with eczema. They are most commonly to egg, cows milk, soy, wheat, peanuts and fish. The reaction may be acute [urticaria](#) (hives) sometimes accompanied by swelling of the face and tongue ([angioedema](#)) or abdominal pain shortly after ingesting the offending food. Severe allergy causes [anaphylaxis](#) and the patient may collapse and even die. Any tiny amount of the food allergen can cause this response. These reactions are not eczema.

However, eczema can be aggravated by certain foods.

- Some foods, particularly fruits, contain salicylates; these can increase histamine release and thus cause temporary itching and redness. This is not allergy.
- Parents often suspect food allergies in children with atopic dermatitis because they notice the eczema getting worse when new foods are introduced. Whilst it is very common for the eczema to become more difficult to manage when new foods are being introduced it is only very rarely due to a true allergy. As eczema tends to reflect other stresses the body is facing, any new challenge, such as the digestive system getting used to a new food, may cause a temporary increase in eczema symptoms. Just as the gut takes some time to tolerate certain new foods, so does the skin.
- The increase in eczema symptoms tends to improve after a month or so of the new food. Infants and children are constantly trying new foods therefore this difficulty with the eczema can last for several months. As a wide variety of foods are very important for young children, it is worth persevering with the increased demands of eczema management during this period. Restricting foods excessively and unnecessarily may cause more detriment to the child's health than a transient worsening of the eczema.
- If you have a strong suspicion of a food allergy, systematically eliminate foods in such a way as it will be possible to tell if the food is responsible. Eliminate one food at a time for at least one week. If the eczema clears then re-institute the food (rechallenge) and look for recurrence of the eczema. Do not rechallenge foods that cause hives or facial swelling. You should have medical supervision when doing such a food trial. Consult a registered dietician to make sure the diet remains nutritionally sound.

Environmental allergies

Environmental allergens may sometimes be related to atopic dermatitis. Many children with atopic dermatitis are allergic to grass, [dust mites](#) and cat dander. Usually this manifests as an immediate reaction with runny nose, sneezing and swollen eyes, and improves after removal from the allergy source. It is uncommon for this type of allergy to cause persistent worsening of the eczema.

- A positive test result to an environmental allergen may prove unhelpful in the management of the eczema. This is in part due to the high rate of false positive reactions as explained above and in part because avoidance of these allergens is very difficult, if not impossible.

- Exposure to dust mites can be reduced, but not eliminated, by regularly vacuuming the house, keeping soft toys and clothes shut away in cupboards, limiting floor carpets, washing linen in hot water and using protective mattress and pillow covers.
- Grass pollen is very difficult to avoid unless the child is forbidden to play outside.
- The relationship between cat dander allergy and eczema is controversial. There is some evidence to suggest that having more cats in the house early in life protects children from developing atopy (asthma, eczema and hay fever). It is not clear at this time whether those with cat dander allergy should be advised to get rid of their cat or not.

[Allergic contact dermatitis](#) is equally common in those without atopic dermatitis.

Stress

- Adults and children are liable to experience an exacerbation in eczema secondary to physical, mental or social stress.
- Stress can come in many forms. Any other illness including a mild common cold may cause a flare in eczema.
- Social stress such as a move to a new area, change in school, family conflict etc. may also affect the eczema.
- Eczema may be the source of stress: it is uncomfortable and can be a major cosmetic concern. The cost of medications and time off work can also be very stressful.

Climate

- Climate undoubtedly plays a major role in the severity of eczema. Cold, damp climates may cause the eczema to become more resistant to treatment. Keeping the temperature even throughout the house is probably helpful. Dehumidifiers tend to be more beneficial for asthma than for eczema as they can dry out the skin further.
- Moving to a new house or new area can have a beneficial or detrimental effect on eczema.
- Most people find that their eczema is better in the summer months. This is partly due to the increased exposure to ultraviolet light, which (in moderation) can have a beneficial effect on eczema. Sunburn is never a good idea! A small percentage of eczema sufferers find that the sun makes their eczema worse and should protect from sun exposure as much as possible. This is called *photosensitive eczema*.
- Most people with eczema will become itchier and have redder skin when they are hot. Keeping cool in hot environments using a fan or air conditioning, and having cool showers or baths will help.
- Cotton clothing and bed linen reduce sweating and help keep skin cool. Avoid wool underlays.

Related information

References:

On DermNet NZ:

- [Atopic dermatitis](#)
- [Treatment of atopic dermatitis](#)
- [Complications of atopic dermatitis](#)
- [Dermatitis](#)

Other websites:

- British Association of Dermatologists
 - [Atopic Eczema](#)
 - [Atopic Eczema – other leaflets](#)
 - [Position Statement: Allergy prevention in children](#): Australasian Society of Clinical Immunology and Allergy
- [Atopic dermatitis](#) – emedicine dermatology, the online textbook

Books about skin diseases:

See the [DermNet NZ bookstore](#)

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DermNet does not provide an on-line consultation service.

If you have any concerns with your skin or its treatment, see a [dermatologist](#) for advice.

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