Overview of Atopic Dermatitis

Atopic dermatitis, often referred to as eczema, is a chronic (long-lasting) disease that causes inflammation, redness, and irritation of the skin. It is a common condition that usually begins in childhood; however, anyone can get the disease. Atopic dermatitis is not contagious, so it cannot be spread from person to person.

Atopic dermatitis causes the skin to become extremely itchy. Scratching leads to further redness, swelling, cracking, “weeping” clear fluid, crusting, and scaling. In most cases, there are periods of time when the disease is worse, called flares, followed by periods when the skin improves or clears up entirely, called remissions.

Researchers do not know what causes atopic dermatitis, but they do know that genes, the immune system, and the environment play a role in the disease. Depending on the severity and location of the symptoms, living with atopic dermatitis can be hard. Treatment can help control symptoms. For many people, atopic dermatitis improves by adulthood, but for some, it can be a lifelong illness.

Who Gets Atopic Dermatitis?

Atopic dermatitis is a common disease and usually appears during infancy and childhood. For many children, atopic dermatitis goes away before the teenage years. However, some children who develop atopic dermatitis may continue to have symptoms as teens and adults. Occasionally, for some people, the disease first appears during adulthood.

The chance of developing atopic dermatitis is higher if there is a family history of atopic dermatitis, hay fever, or asthma. In addition, research shows that atopic dermatitis is more common in non-Hispanic black children and that women and girls tend to develop the disease slightly more often than men and boys.

Symptoms of Atopic Dermatitis
The most common symptom of atopic dermatitis is itching, which can be severe. Other common symptoms include:

- Red, dry patches of skin.
- Rashes that may ooze, weep clear fluid, or bleed when scratched.
- Thickening and hardening of the skin.

The symptoms can flare in multiple areas of the body at the same time and can appear in the same locations and in new locations. The appearance and location of the rash vary depending on age; however, the rash can appear anywhere on the body.

Infants

During infancy and up to 2 years of age, it is most common for a red rash, which may ooze when scratched, to appear on the:

- Face.
- Scalp.
- Area of skin around joints that touch when the joint bends.

Some parents worry that the infant has atopic dermatitis in the diaper area; however, the condition rarely appears in this area.

Childhood

During childhood, usually 2 years of age to puberty, it is most common for a red thickened rash, which may ooze or bleed when scratched, to appear on the:

- Elbows and knees, usually in the bend.
- Neck.
- Ankles.

Teens and Adults

During the teenage and adult years, it is most common for a red to dark brown scaly rash, which may bleed and crust when scratched, to appear on the:

- Hands.
- Neck.
- Elbows and knees, usually in the bend.
- Skin around the eyes.
- Ankles and feet.
Other common skin features of atopic dermatitis include:

- An extra fold of skin under the eye, which is known as a Dennie-Morgan fold.
- Darkening of the skin beneath the eyes.
- Extra skin creases on the palms of the hands and soles of the feet.

In addition, people with atopic dermatitis often have other conditions, such as:

- Asthma and allergies, including food allergies.
- Other skin diseases, such as ichthyosis, which causes dry, thickened skin.
- Depression or anxiety.
- Sleep loss.

Researchers continue to study why having atopic dermatitis as a child can lead to the development of asthma and hay fever later in life.

Complications of atopic dermatitis can happen. They include:

- Bacterial skin infections that can worsen from scratching. These are common and may make the disease harder to control.
- Viral skin infections.
- Sleep loss that can lead to behavior issues in children.
- Hand eczema (hand dermatitis).
- Eye problems such as:
  - Conjunctivitis (pink eye), which causes swelling and redness in the inside of your eyelid and the white part of your eye.
  - Blepharitis, which causes general inflammation and redness of your eyelid.

Causes of Atopic Dermatitis

No one knows what causes atopic dermatitis; however, researchers know that changes in the protective layer of the skin can cause it to lose moisture. This can cause the skin to become dry, leading to damage and inflammation in the skin. New research suggests that inflammation directly triggers sensations of itch which in turn cause the patient to scratch. This leads to further damage of the skin as well as increased risk for infection with bacteria.

Researchers do know that the following may contribute to the changes in the skin barrier, which critically regulates moisture:

- Changes (mutations) in genes.
- Problems with the immune system.
• Exposure to certain things in the environment.

Genetics
The chance of developing atopic dermatitis is higher if there is a family history of the disease, which suggests that genetics may play a role in the cause. Recently, researchers found changes to genes that control a specific protein and help our bodies maintain a healthy layer of skin. Without the normal levels of this protein, the skin barrier changes, allowing moisture to escape and exposing the skin immune system to the environment, leading to atopic dermatitis.

Researchers continue to study genes to better understand how different mutations cause atopic dermatitis.

Immune System
The immune system normally helps to fight off illness, bacteria, and viruses in your body. Sometimes, the immune system becomes confused and overactive, which can create inflammation in the skin, leading to atopic dermatitis.

Environment
Environmental factors may trigger the immune system to change the protective barrier of the skin allowing more moisture to escape, which can lead to the atopic dermatitis. These factors may include:

• Exposure to tobacco smoke.
• Certain types of air pollutants.
• Fragrances and other compounds found in skin products and soaps.
• Excessively dry skin.

Diagnosis of Atopic Dermatitis
Diagnosing atopic dermatitis may include the following:

• Giving the doctor your or your child’s medical history, including:
  ○ Your family history of allergies.
  ○ Whether you also have diseases such as hay fever, asthma, or food allergies.
  ○ Sleep problems.
  ○ Foods that seem to trigger hives.
  ○ Previous treatments for skin-related symptoms.
- Use of steroids or other medications.
- Exposure to irritants, such as:
  - Soaps and detergents.
  - Some perfumes and cosmetics.
  - Cigarette smoke.

- Examining your skin and the rash.
- Ordering laboratory tests, such as:
  - Blood tests to check for other causes of the rash.
  - Skin biopsy of the rash or lesion.

Your doctor may need to see you or your child several times to make an accurate diagnosis and to determine if symptoms are from other diseases and conditions or from atopic dermatitis.

**Treatment of Atopic Dermatitis**

The goals for treating atopic dermatitis include:

- Manage and control dry skin.
- Contain skin inflammation.
- Control itching.
- Promote healing.
- Prevent infections.
- Prevent flares.

Your doctor will work with you to develop a treatment plan based on the:

- Location and type of rash, including the severity of the itching.
- Triggers that are unique to you or your child, to avoid exposure and prevent potential flares.
- The skin’s response to specific treatments, to identify which treatments seem to work best.

Treatments usually include a combination of therapies and can include:

- **Medications.** Your doctor may prescribe one or more of the following medications to treat atopic dermatitis, depending on the severity of the disease and your or your child’s age:
  - Moisturizing creams can help restore the skin barrier.
Corticosteroid creams and ointments help to decrease inflammation and are commonly used to treat diseases affecting the skin. Doctors do not usually prescribe oral corticosteroids to treat atopic dermatitis because after stopping the normal dose, atopic dermatitis can flare or rebound and be more severe than before.

- Calcineurin inhibitors applied to the skin decrease inflammation and help prevent flares.
- Phosphodieterase-4 inhibitors, a topical cream, can help with inflammation when the symptoms do not respond to other treatments.
- Pills that reduce the abnormal immune response can be used but are reserved for more severe disease, and they require close monitoring.
- Biologic medication, which is given by an injection just under the skin, blocks specific functions of the immune system to help control and manage atopic dermatitis. At this time, biologic medications are only approved to treat adults and adolescents with the condition.

**Skin care.** Keeping the skin hydrated by applying moisturizers immediately after bathing to hold the water in your skin is important when treating atopic dermatitis. Your doctor will recommend how often you or your child should bathe and the type of moisturizer you should use. In some cases, doctors may recommend the following skin care for AD:

- A diluted bleach bath twice a week to help treat AD and prevent infections. It is important to follow your doctor’s specific instructions when taking a bleach bath. You should not use this treatment without first talking to your doctor.
- Wet wrap therapy to help increase moisture in the skin when the condition is persistent. However, only use wet wraps after speaking with your doctor.

**Phototherapy.** If the atopic dermatitis is severe, widespread, and has not responded to other treatments, your doctor may recommend the use of ultraviolet A or B light waves to treat symptoms.

If you or your child develops skin infections from atopic dermatitis, your doctor may recommend additional topical or oral antibiotic treatments.

It is important to use skin treatments as directed and follow up with your doctor regularly to make sure the treatment plan is working.

**Who Treats Atopic Dermatitis?**

The following health care providers may diagnose and treat atopic dermatitis:

- Dermatologists, who specialize in conditions of the skin, hair, and nails. You may want to find a dermatologist that specializes in treating atopic dermatitis.
- Allergists, who specialize in treating allergies.
Primary health care providers, including family doctors, internists, or pediatricians.

Living With Atopic Dermatitis

Depending on the location and severity of the atopic dermatitis, living with the condition can be hard. Here are some tips to help control atopic dermatitis.
• **Caring for skin.** Following a daily skin care routine is important and helps prevent flares. Skin care can include:
  ○ Taking lukewarm baths to cleanse and moisturize the skin without drying it excessively. Limit baths to once a day.
  ○ Using mild unscented bar soap or non-soap cleanser.
  ○ Patting the skin dry after bathing and not allowing it to get too dry before moisturizing (avoid rubbing or brisk drying).
  ○ Using a moisturizer to seal in the water that has been absorbed into the skin during bathing. Use cream and ointments and avoid lotions with high water or alcohol content, which can cause burning.
  ○ Protecting the skin from irritants and rough clothing, such as wool.

• **Talking to your doctor about potential food allergies.**
• **Managing stress.** Using stress management and relaxation techniques can help lower your stress and decrease the likelihood of flares. Developing a network of support that includes family, friends, health professionals, and support groups or organizations can be beneficial.
• **Preventing skin irritations.** Try to avoid scratching or rubbing, which irritates the skin, increases inflammation, and can increase itchiness. Keep your child’s fingernails short to help reduce scratching.
• **Seeking counseling.** If you are feeling overwhelmed, embarrassed, or anxious about the condition, seek counseling with a mental health professional.
• **Maintaining level indoor temperatures.** Try keeping the inside of your home at a cool, stable temperature and consistent humidity levels. Avoid situations where overheating may occur. This may help prevent flares.
• **Getting restful sleep.** If you or your child is unable to get restful sleep at night because of itching and scratching, talk to your doctor about options to better control the atopic dermatitis.
• **Avoiding exposure to the smallpox vaccine.** Anyone with atopic dermatitis should not receive a smallpox vaccine. If you have atopic dermatitis and you receive the smallpox vaccine, you are more likely to develop a serious complication to the vaccine, even if your condition is mild or not active at the time of the shot. In addition, you should avoid being around others who have recently received the vaccine. Talk to your doctor about your risks before anyone in your household receives the vaccine.

**Research Progress Related to Atopic Dermatitis**

The [NIAMS Dermatology Branch](https://www.niams.nih.gov/Research-Diagnosis/Atopic-Dermatitis) conducts clinical and basic research of the skin and skin diseases, including topics such as:

• The skin as an organ that is part of our immune system.
• The causes, diagnosis, and treatment of skin diseases, particularly inflammatory skin diseases.
• The human microbiome and its influence in healthy people and those with atopic dermatitis.

Additional areas of research on atopic dermatitis, include:

• **Genetics.** Although atopic dermatitis runs in families, the role of genetics remains unclear. Scientists have also found that the disease is associated with mutations in certain genes that normally help form a protective skin barrier.
• **Skin development and maintenance.** Discoveries about how the body creates and maintains skin will help us understand why the skin barrier breaks down.
• **Understanding itch.** Researchers are studying how the nervous system and the immune system communicate to cause the inflammation, itch, and pain seen in atopic dermatitis.
• **Immune system imbalance.** Researchers continue to study links between atopic dermatitis and autoimmune diseases, including exploring factors that play a role in the immune response causing inflammation like that seen in atopic dermatitis.
• **Itching.** Many recent studies demonstrate that specific proteins associated with inflammation in the skin stimulate sensory nerves to trigger sensations of itch. These factors are being targeted in new and emerging treatments for atopic dermatitis.

**For More Info**

**U.S. Food and Drug Administration**
Toll free: 888-INFO-FDA (888-463-6332)
Website: [https://www.fda.gov](https://www.fda.gov)

Drugs@FDA at [https://www.accessdata.fda.gov/scripts/cder/daf](https://www.accessdata.fda.gov/scripts/cder/daf). Drugs@FDA is a searchable catalog of FDA-approved drug products.

**Centers for Disease Control and Prevention, National Center for Health Statistics**
Website: [https://www.cdc.gov/nchs](https://www.cdc.gov/nchs)

**National Institute of Allergy and Infectious Diseases**
Website: https://www.niaid.nih.gov/diseases-conditions/eczema-atopic-dermatitis

**American Academy of Dermatology**
Website: [https://www.aad.org](https://www.aad.org)

**American Academy of Allergy, Asthma, and Immunology**
Website: [https://www.aaaai.org](https://www.aaaai.org)

**National Eczema Association**
Website: https://www.nationaleczema.org

Food Allergy Research & Education
Website: https://www.foodallergy.org

If you need more information about available resources in your language or other languages, please visit our webpages below or contact the NIAMS Information Clearinghouse at NIAMSInfo@mail.nih.gov.

- Asian Language Health Information
- Spanish Language Health Information