

# NIH News in Health

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## Red, Itchy Rash? Get the Skinny on Dermatitis

You've probably had a rash at some point or another, whether from poison ivy or the chickenpox or something more unusual. Why does your skin break out in red blotches like that? More important, is there anything you can do about it?

We often think of the skin as a barrier—it keeps the insides of our bodies in, and it keeps the outside world out. But our skin is also filled with special cells of the **immune system**. These cells protect the skin and body against viruses, bacteria and other threats. Whenever these cells detect a suspicious substance, they begin a chain reaction in the skin that leads to **inflammation**. The medical name for this reaction is dermatitis. But it's more commonly known as a rash.

There are many different types of dermatitis, and each has a distinct set of treatments. Sometimes the skin's immune cells react to some-

thing that directly touches the skin. Other times, the immune system flares in the skin because of a whole-body infection or illness.

The symptoms of these different types of rashes often overlap. "Itching is a common symptom for all these problems," says Dr. Stephen I. Katz, director of NIH's National Institute of Arthritis and Musculoskeletal and Skin Diseases.

Many rashes are red, painful, and irritated. Some types of rash can also lead to blisters or patches of raw skin. While most rashes clear up fairly quickly, others are long lasting and need to be cared for over long periods of time.

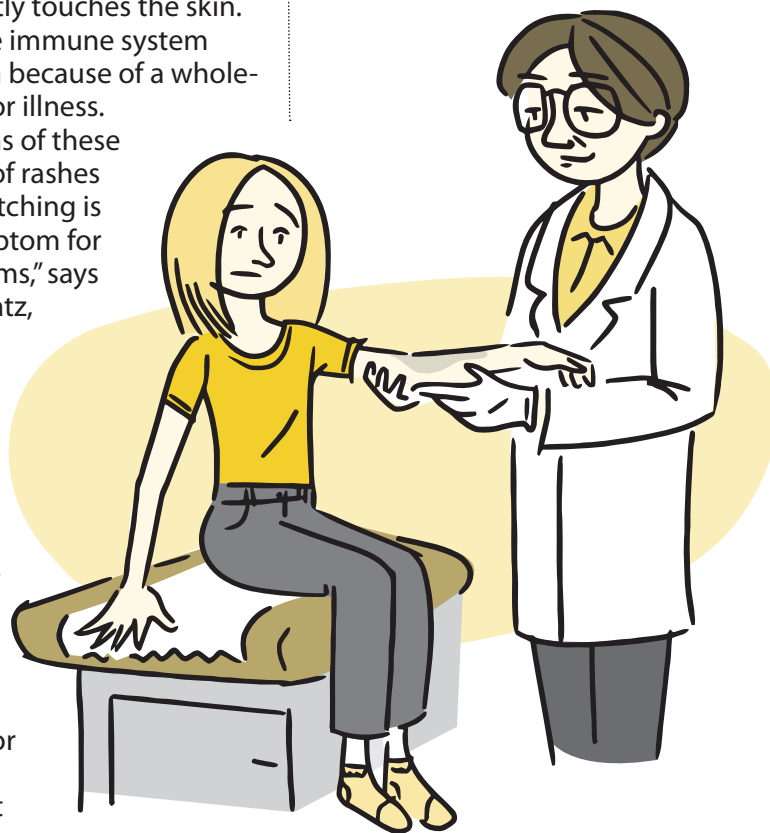
Eczema, or atopic dermatitis, is a dry, red, itchy rash that affects up to 1 in 5 infants and young children. It often improves over time, although it can last into adulthood or start later in life. In this condition, the water-tight barrier between skin cells gets weak, which lets moisture out and other things in. That's why people with atopic dermatitis have to moisturize their skin, and they're more susceptible to skin infections.

Researchers have recently identified specific **genes** that are

involved in maintaining the skin barrier. People with certain versions of these genes are more likely to get atopic dermatitis.

"The skin is the outermost sentinel for fighting off bacteria and noxious agents," says Katz. "If the barrier is broken somehow, you can become more allergic to things."

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### Definitions

#### Immune System

The system that protects your body from invading viruses, bacteria and other microscopic threats.

#### Inflammation

Heat, swelling and redness caused by the body's protective response to injury or infection.

#### Genes

Stretches of DNA, a substance you inherit from your parents, that define characteristics such as how likely you are to get certain diseases.

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A skin allergy, or allergic contact dermatitis, produces a red, itchy rash that sometimes comes with small blisters or bumps. The rash arises when the skin comes in contact with an allergen, a usually harmless substance that the immune system attacks. Allergens trigger allergic reactions. Allergens can come from certain soaps, creams and even pets.

Your immune system might not react the first time you encounter an allergen. But over time, your immune system can become sensitive to the substance. As a result, your next contact may lead to inflammation and an allergic rash.

"The most common form of dermatitis that is seen anywhere is an allergic contact dermatitis to nickel," says Katz. "Why? Because of ear piercing." Many inexpensive earrings are made of nickel, and over time, wearing nickel earrings can cause an allergic reaction to the metal.



### Wise Choices Call Your Doctor If...

- Your rash is so uncomfortable or painful it interferes with daily activities or sleep.
- The rash is on your face.
- Your rash looks worrisome or seems infected.
- You break out in a rash after taking a new medication.
- Your rash lasts for several days.

Other common causes of allergic dermatitis are poison oak and poison ivy. The stems and leaves of these plants produce a chemical that's likely to cause allergies. If you touch one of them, wash your skin as soon as possible. The chemical can also remain in clothing for a long time, so it's important to wash any clothes or shoes—or even pets—that come into contact with these plants.

Mild cases of allergic contact dermatitis usually disappear after a few days or weeks. But if the rash persists, is extremely uncomfortable or occurs on the face, it's important to see a physician. A doctor can prescribe medications that will tone down the immune reaction in the skin. This eases swelling and itching and will protect your eyes and face.

The immune cells of the skin can also produce rashes when they react to invading germs—like bacteria, fungi and viruses. Bacterial and viral infections within your body can cause your skin to break out in spots as well. The chickenpox virus, for example, can cause itchy spots in children. Years later, in older adults, the same virus may reappear as shingles, bringing a painful rash and high fever. Vaccines can prevent several rash-causing diseases, including chickenpox, shingles and measles.

Certain drugs, including antibiotics like amoxicillin, may also cause itchy skin rashes. If you're allergic to a drug, a rash can be the first sign of a serious reaction. As with other allergies, a reaction to a drug may not occur the



### Web Links

For more information about dermatitis, see our links online:

<http://newsinhealth.nih.gov/issue/Apr2012/Feature1>

first time you take it. It could show up after several uses. Not all drug rashes are due to an allergy, however. If you break out in itchy spots after starting a new drug prescription, contact your doctor right away.

While most rashes get better with time, some can last a lifetime. Psoriasis, a condition where skin cells build up into thick red patches, tends to run in families. "It's a complex genetic disease, in that there's not one gene that causes psoriasis but many," says Katz. Even though none of these genes alone has a great effect on the disease, knowing which genes are involved can help researchers design potential new treatments. Other long-term diseases that can produce rashes include autoimmune diseases, such as lupus, and some forms of cancer.

If you notice an itchy or painful rash on your skin, think twice before going to the drugstore and getting some cream if you don't know the cause. "The creams that you buy can produce problems that make your original problem even worse," Katz says. Because rashes can be caused by many different things—bacteria, viruses, drugs, allergies, genetic disorders, and even light—it's important to figure out what kind of dermatitis you have.

"If you have any significant rash, you should see a dermatologist," says Katz. A dermatologist, or skin doctor, is specially trained to figure out what's causing a rash and help you get the right treatment.

Your skin is your protection. It's not just the covering that keeps your body in; it's also your first line of defense against germs and chemicals. Take care of your skin so your skin can take care of you. ■

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# When Blood Cells Bend

## Understanding Sickle Cell Disease

For people who don't suspect they carry the sickle cell **gene**, having a baby with sickle cell disease can be heartbreaking. The illness is inherited and lasts a lifetime. Fifty years ago, half of children born with sickle cell disease died by age 10. Now they're living into their 40s and 50s, thanks to therapies developed with NIH support. Researchers are now working on promising new treatments.

Sickle cell disease is a serious disorder in which the body makes red blood cells that have a sickle shape—like the letter C. These stiff, misshaped cells can lead to painful episodes, serious infections, organ damage and long-term **anemia**.

By some estimates, 70,000 to 100,000 Americans have sickle cell disease. Most are African Americans, although the disease also occurs in Hispanic Americans and others.

"It's a rare disease in the U.S.," says Dr. Gregory Kato, a sickle cell disease expert at NIH. "But sickle cell disease affects millions of people in Africa, as

well as in Saudi Arabia, India, South America and other regions."

The sickle cell gene has an even broader reach. More than 2 million Americans—including 1 in 12 African Americans—carry 1 copy of the abnormal gene. They're said to have sickle cell trait. While they don't have sickle cell disease, they can still pass the flawed gene to their children.

Sickle cell disease arises when you inherit 2 abnormal genes, 1 from each parent. The genes make a defective form of hemoglobin, the oxygen-carrying protein in red blood cells. Affected cells collapse into a sickle shape. The sickled cells bunch together and reduce blood flow through your blood vessels. That can cause severe and sudden pain throughout the body and lead to stroke or organ damage from lack of oxygen. This medical emergency, called a sickle cell crisis, can be treated with pain medication and blood transfusions.

A blood test can show if you have sickle cell disease or the trait. All states now test newborns as part of their screening programs, so treatment can begin early.

Severe sickle cell disease can be treated with a medicine called hydroxyurea. It helps to prevent red blood cells from sickling. Hydroxyurea doesn't cure sickle cell disease, but it can make it milder. And it was recently shown to be safe and effective for very young children.

"Although the treatment of sickle cell disease pain crisis hasn't changed much since the discovery of the disease a hundred years ago, there



are more new treatments now under investigation than in any time in history," says Kato. "All clinical drug trials are always speculative. Most don't work out, but some do. Biomedical scientists like us are working towards the future."

If you have sickle cell disease, take steps to prevent and control its complications by maintaining a healthy lifestyle. If you're at high risk of having a child with sickle cell anemia and are planning to have children, ask your health care professional about genetic counseling. ■



### Wise Choices Living with Sickle Cell Disease

- See a sickle cell disease expert regularly.
- Visit your eye doctor to check for eye damage.
- Work with your doctor to find ways to manage pain.
- Make sure babies and young children get needed antibiotics and routine vaccinations to prevent infections.
- Seek specialized prenatal care if you have sickle cell disease and are pregnant or planning to become pregnant.
- Join a patient support group.



### Web Links

For more information about sickle cell disease, see our links online:  
<http://newsinhealth.nih.gov/issue/Apr2012/Feature2>



### Definitions

#### Gene

A stretch of DNA, a substance you inherit from your parents, that defines characteristics such as your risk for certain diseases.

#### Anemia

A condition caused by low levels of red blood cells or hemoglobin in the blood. It can cause fatigue, dizziness and headaches.

# Health Capsules

For links to more information, see these stories online:  
<http://newsinhealth.nih.gov/issue/Apr2012/Capsule1>

## Colonoscopies Cut Colon Cancer Deaths

Removing **polyps** during colonoscopy can prevent **colorectal cancer** and reduce deaths from the disease for years, a new study finds.

Colorectal cancer is one of the most common cancers in both men and women nationwide. The disease is expected to kill more than 52,000 Americans this year alone.

Screening tests like colonoscopies can detect early-stage colorectal cancer before symptoms appear. In

a colonoscopy, doctors use a long, lighted, flexible tube to examine inside the rectum and colon. Many growths they see, including polyps, can be removed during the procedure. Most polyps are benign, but some (called adenomas) can become cancer.

To see if polyp removal during colonoscopy might decrease deaths from colorectal cancer, a team of NIH-funded scientists examined data from over 2,600 patients who had adenomas removed.

During an average 16 years of follow-up, more than 1,200 deaths occurred in the group. But only 12 of the deaths were due to colorectal cancer. Among the general population, over 25 patients in a comparable group would have been expected to die from colorectal cancer. This suggests that adenoma removal

could reduce the risk of dying from colorectal cancer by up to one half.

“Our findings provide strong reassurance that there is a long-term benefit to removing these polyps and support continued recommendations of screening for colorectal cancer in people over age 50,” says the study’s lead author, Dr. Ann Zauber of the Memorial Sloan-Kettering Cancer Center. Ongoing clinical trials will gather additional evidence to confirm whether colonoscopy screening can also reduce these deaths in the general population. ■



### Definitions

#### Polyps

Growths on the inside lining of the colon or rectum.

#### Colorectal Cancer

Cancer of the colon or rectum, both part of the large intestine.

## Fact Sheet Highlights Diabetes Blood Test

About 7 million Americans today have diabetes but don’t realize it. This puts them at risk for the serious complications that can arise when diabetes is left untreated.

A new fact sheet from NIH describes a blood test called A1C, which can diagnose type 2 diabetes and even prediabetes. Prediabetes raises your risk for developing type 2 diabetes.

You don’t need to fast before taking the A1C test, so it’s more convenient than other glucose tests often used to diagnose diabetes. The A1C

test can also help patients with type 1 and type 2 diabetes to monitor their blood sugar (glucose) levels.

The new fact sheet covers a wide range of details about the A1C test, including how the test works, other blood tests for type 2 diabetes and prediabetes, the accuracy of blood tests and more.

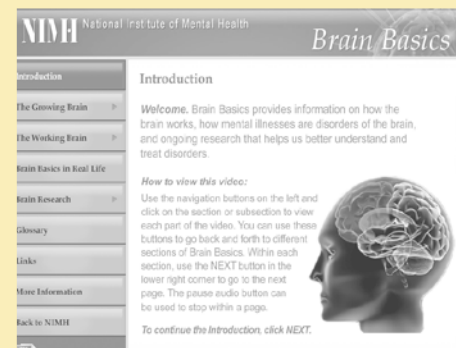
The *A1C Test and Diabetes* fact sheet is available at [www.diabetes.niddk.nih.gov/dm/pubs/A1CTest](http://www.diabetes.niddk.nih.gov/dm/pubs/A1CTest). Or contact NIH’s National Diabetes Information Clearinghouse at 1-800-860-8747 or email: [ndic@info.niddk.nih.gov](mailto:ndic@info.niddk.nih.gov). ■



### Featured Website Brain Basics

[www.nimh.nih.gov/brainbasics/index.html](http://www.nimh.nih.gov/brainbasics/index.html)

Simple and straight-forward videos give you the basics of brain biology. Get an overview of how the brain works and how mental illness is linked to brain function. Learn about brain regions, neurotransmitters, gene studies, brain imaging and more.



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