# CEU Update

A semi-annual publication of the
National Association for Health Professionals

*June 2007*

*Issue #0607*


**Psoriasis**

Psoriasis (sore-I-ah-sis) is a common immune-mediated chronic skin disease that comes in different forms and varying levels of severity. Most researchers now conclude that it is related to the immune system (psoriasis is often called an "immune-mediated" disorder).

It is not contagious. In general, it is a condition that is frequently found on the knees, elbows, scalp, hands, feet or lower back. Many treatments are available to help manage its symptoms. More than 4.5 million adults in the United States have it.

Between 10 percent and 30 percent of people with psoriasis also develop a related form of arthritis, called psoriatic (sore-ee-AA-tic) arthritis.

The National Psoriasis Foundation has gathered the information in this section to help educate people about this complex disease, including its appearance, symptoms and medical and social effects.

What does it look like?

It generally appears as patches of raised red skin covered by a flaky white buildup. In certain kinds of psoriasis, it also has a pimple-ish (pustular psoriasis) or burned (erythrodermic) appearance. Psoriasis can also cause intense itching and burning.

What causes it?

Researchers believe the immune system sends faulty signals that speed up the growth cycle in skin cells.

Certain people carry genes that make them more likely to develop psoriasis, but not everyone with these genes develops psoriasis. Instead, a "trigger" makes the psoriasis appear in those who have these genes. Also, some triggers may work together to cause an outbreak of psoriasis; this makes it difficult to identify individual factors. Possible psoriasis triggers:

- Emotional stress
- Injury to the skin
- Some types of infection
- Reaction to certain drugs

Once the disease is triggered, the skin cells pile up on the surface of the body faster than normal. In people without psoriasis, skin cells mature and are shed about every 28 days. In psoriatic skin, the skin cells move rapidly up to the surface of the skin over three to six days. The body can't shed the skin cells fast enough and this process results in patches also called "lesions" forming on the skin's surface.

Triggers

Psoriasis is not contagious, no one can "catch" it from another person. Due to genes, certain people are more likely to develop it, but a "trigger" is usually necessary to make psoriasis appear.

*Stress*

Stress is a proven trigger in some people. It can cause psoriasis to flare for the first time or aggravate existing psoriasis.

Relaxation and stress reduction may help people with psoriasis. For example, not only does relaxation help lower stress levels, but also it gives people a feeling of control. These techniques, however, seem to work best with traditional medical treatments.

*Injury to skin*

Sometimes psoriasis appears in areas of the skin that have been injured or traumatized. This is called the "Koebner phenomenon." Vaccinations, sunburns, and scratches can all trigger a Koebner (KEB -ner) response. The Koebner response can be treated if it is caught early enough. For example, people receiving a vaccination may be at risk for the Koebner response, but the physician can bring it under control if the psoriasis occurs at the injection site.

*Medicine*

Certain medications are associated with triggering psoriasis.

Lithium: Used to treat manic depression and other psychiatric disorders. Lithium aggravates psoriasis in about half of those with psoriasis. However, people can ask their physicians about alternatives to lithium.

Antimalarials: Quinacrine, chloroquine and hydroxychloroquine may cause a flare of psoriasis, usually two to three weeks after the drug is taken. Hydroxychloroquine has the lowest incidence of side effects.

Inderal: This high blood pressure medication worsens psoriasis in about 25 percent to 30 percent of patients with psoriasis. It is not known if all high blood pressure (beta blocker) medications worsen psoriasis, but they may have that potential. Sometimes other medications can be substituted.

Quinidine: This heart medication has been reported to worsen some cases of psoriasis.

Indomethacin: This drug is used to treat arthritis. It is a nonsteroidal anti-inflammatory drug. It has worsened some cases of psoriasis. Other anti-inflammatories usually can be substituted. Indomethacin's negative effects are usually minimal when it is taken properly. Its side effects are usually outweighed by its benefits in psoriatic arthritis.

*What are other triggers?*

- Weather may make skin drier and more susceptible to a psoriasis outbreak.
- Strep infection may trigger guttate psoriasis.
- Allergies, although unproven, are suspected to trigger psoriasis in certain people.

How is psoriasis diagnosed?

There is no blood test for psoriasis. Physicians usually diagnose it by examining the affected skin. Less often, a small piece of skin affected by the psoriasis is cut out and examined under a microscope.

Psoriasis is a genetic disease. A family association exists in one out of three cases. It often appears between ages 15 and 35, but it can develop at any age. About 10 percent to 15 percent of those with psoriasis get it before age 10, and occasionally it appears in infancy.

How serious is psoriasis?

Psoriasis is measured in terms of its physical and emotional impact. Physically, if less then 2 percent of the body is involved, the case is considered mild. Between 3 and 10 percent is considered moderate, and more than 10 percent is severe. For reference, the palm of one hand roughly equals 1 percent.

Psoriasis also is measured by its impact on quality of life. When psoriasis involves the hands and feet, it may also be considered severe because of how it affects a person's ability to function. Or, if a person's psychological or emotional well-being is considerably affected, the psoriasis may also be considered severe.

Are there different types of psoriasis?

There are five different types of psoriasis. The most common form of psoriasis is called "plaque psoriasis," which is characterized by well-defined patches of red, raised skin. About 80 percent of people with psoriasis have this type. Plaque psoriasis can appear on any skin surface, although the knees, elbows, scalp, trunk and nails are the most common locations. The other types of psoriasis are:

- Guttate: Small, red, individual drops on the skin
- Inverse: Smooth, dry areas of skin, often in folds or creases, that are red and inflamed but do not have scaling
- Erythrodermic: Periodic, widespread, fiery redness of the skin
- Pustular: Involves either generalized, widespread areas of reddened skin, or localized areas, particularly the hands and feet (palmo-plantar pustular psoriasis)

Typically, people have only one form of psoriasis at a time. Sometimes two different types can occur together, one type may change to another type, or one type may become more severe. For example, a trigger may convert plaque psoriasis to pustular.

Although the reasons for the changes are not well understood, some triggers may include abrupt withdrawal of medications; an allergic, drug-induced rash that brings on the Koebner response (psoriasis appearing on the site of skin injuries); and severe sunburning.

The different types of psoriasis not only have different appearances, but also may require different types of treatment. It is very important that you talk with your physician about what course of action to take with your type of psoriasis.

Treatment

Psoriasis has no cure, but a wide range of treatments can give people control over their disease. Many different treatments can reduce or nearly eliminate the symptoms of psoriasis. No single treatment works for everyone, but something is likely to work in most cases. A number of factors determine which treatment to try, including:

- The type of psoriasis
- Its location on the body
- Its severity
- The person's age and medical history

A doctor, particularly a dermatologist, can provide guidance in selecting the right treatment. The traditional approach is to start with the least potent treatments (topicals, phototherapy) and move to stronger ones (such as methotrexate or biologics) until a satisfactory combination of results and risks is found. The goal is to find a treatment that has the best results and the fewest side effects.

However, it is also acceptable for stronger treatments to be used right away, if a patient and a doctor decide together that this is warranted after weighing the treatment's side effects and effectiveness. This may be particularly appropriate when a person's quality of life is greatly impacted or when the psoriasis is more severe or disabling, such as pustular or erythrodermic psoriasis.

*The general approach*

Many safe, effective treatments can improve the condition of the skin and reduce swelling, redness, flaking and itching. Some treatments can temporarily clear the skin (this is called a "clearance" or "remission" of psoriasis). Some can be used for a period of time to reduce new flares of lesions.

Because psoriasis is chronic and unpredictable, it can be challenging to treat. It often improves and worsens in a natural cycle over time. But people can usually find success by experimenting with treatments under their doctor's guidance.

Treatments for psoriasis can be divided into three basic categories:

- Topical treatment (external treatments)
- Phototherapy (artificial ultraviolet light, or a combination of ultraviolet light and medications)
- Systemic (internal) medications taken by pill or injection
- Topical treatment

Topical treatments are used after determining the extent of the disease, location of disease, disability produced by the disease and person's age.

- Anthralin
- Calcipotriene
- Coal tar
- Salicylic acid
- Steroids
- Tazarotene
- Other topicals

*Phototherapy*

Phototherapy is generally used for people with moderate to severe psoriasis who are not responding to topical treatments or who have disease too extensive for topicals. However, laser phototherapy may be used to target selected areas of the skin.

- Lasers: Pulsed dye and excimer
- PUVA
- Sunlight
- Ultraviolet light B (UVB)

*Systemic Medications*

Systemic drugs usually are reserved for people with moderate to severe psoriasis or disabling psoriatic arthritis. They also are used for erythrodermic or pustular psoriasis.

- Biologics
- Cyclosporine
- Methotrexate
- Oral retinoids
- Other systemics

Research

Research into psoriasis was at an early stage when the National Psoriasis Foundation was founded in 1968. The disease had no known causes and very few effective treatments. In recent years, psoriasis research has accelerated significantly.

While much is known about psoriasis and psoriatic arthritis, the steps that cause it, from the gene that triggers the immune system to the final skin lesion or joint pain, have not been established in a beginning-to-end way. However, researchers know much more than before, and safe and long-term control of the disease is closer than ever.

**Genes**

Psoriasis starts with the genes in our cells. While it is known that psoriasis is an immune-mediated disease, researchers are exploring exactly how the immune system malfunctions and results in psoriasis in the skin and psoriatic arthritis in the joints. By understanding the changes in our genetic makeup that lead to susceptibility to psoriasis, we have a better understanding of how to design new therapies.

Researchers are investigating how the genes in people with psoriasis create a susceptibility to the disease. When a misstep occurs in the way a gene creates a protein, disease may result. In the case of psoriasis, when the protein communicates with other cells, the immune response deviates.

- The DNA that encodes the genes may have too many components. It may contain extra chemical pieces (base pairs) that make up DNA, which results in "faulty" proteins being made, or not produced at all.
- Some base pairs on the DNA could be missing, which can also lead to missing or faulty proteins.
- Some genes may be turned on or off at the wrong rate, or in the wrong place; this is called a "regulatory mutation."

More people may carry the gene for psoriasis than are actually affected by it. Why? It is known that some people are more likely to have psoriasis than others, and that this "susceptibility" may lie in the genes themselves. Researchers currently believe that for a person to develop psoriasis, two steps must occur. First, the individual must receive a combination of different genes (a combination which is likely to be different for different people) that can work together to cause psoriasis. Carrying these genes is not enough by itself to guarantee that you will develop the disease.

As a necessary second step, the individual must be exposed to specific environmental factors that can trigger the immune defect caused by that particular combination of genes. This results in psoriasis. Just like the genetic causes of psoriasis, these environmental factors, believed to include infection and stress, are not yet well understood or defined.

Inheritance: Scientists now believe that at least 10 percent of the general population inherits genetic changes that create a predisposition to develop psoriasis. However, only 2 percent to 3 percent of the population develops the disease. Of that number, about one out of three has a close relative with the disease.

This is thought to be because only 2 percent to 3 percent of people encounter the "right" mix of genetic and environmental triggers that lead to the development of psoriasis. Those who don't have a family history of it, for example, may have "inherited" two genes from their father and two from their mother, neither of whom had all four and therefore never developed psoriasis.

Multiple genes: Investigative research is made more difficult when multiple genes are involved. Different genes may be associated with different types of psoriasis, and some genes might be present only in people who develop psoriatic arthritis.

Different "strengths": Each gene may be a different "strength." People may have to inherit a certain combination of strong and weak psoriasis genes to make them actually susceptible to developing the disease. Not everyone who develops psoriasis may inherit exactly the same "package."

Researchers do not yet know why the genetic abnormality that leads to psoriasis and psoriatic arthritis is not expressed in other parts of the body. Some other inflammatory diseases driven by changes in the immune system, like Crohn's disease, which affects the intestines and colon, may be associated with a similar genetic abnormality as psoriasis.

*What is happening with genetic research?*

Research into the genetics of psoriasis did not begin until the early 1970s. Recently, it has exploded in scope, thanks to improvements in medical and genetic technology, National Psoriasis Foundation encouragement and increased funding. The draft of the human genetic code will soon lead to a precise map of our genes. By understanding how people who develop psoriasis are genetically different than people who do not, scientists may be able to create treatments that "correct" the behavior of cells. They may even be able to fix the faulty genes using "gene therapy."

Genes hold the key to opening the door to new treatments, as they tell us what causes psoriasis to occur. Dr. Anne Bowcock, a professor of genetics at Washington University in St. Louis has just reported the discovery of the first genetic changes, which cause susceptibility to psoriasis. This was reported in the December 2003 issue of Nature Genetics. These genes lie on chromosome 17.

*Immune System*

In 1979 researchers accidentally found that a drug that suppresses the immune system in bone marrow patients also treated psoriasis. Later, they discovered that cyclosporine, given to people undergoing kidney transplants, also treated psoriasis and suppressed T cells, an important part of the immune system. More than two decades later, much more is known about how the immune system affects psoriasis. The study of the immune system is called "immunology."

*How does the immune system affect psoriasis?*

The normal immune system protects the body against "invaders" (non-self forms) by targeting bacteria, viruses and other foreign proteins. In the person who has psoriasis, the immune system "misfires" and inappropriately targets the skin cells.

The skin cells then reproduce too quickly and the skin (and the joints, in some people) becomes inflamed. Many steps in this misfired immune response are targeted by old and new treatments. The goal is to block or modify the response by focusing on very specific immune cells, thus avoiding widespread effects on other parts of the body.

Targeting the immune system as a way of treating psoriasis is not new. Many of today's psoriasis therapies, including cyclosporine and methotrexate, are believed to work because they affect the immune system. However, new experimental drugs may be "smarter" in that they target specific immune responses, not the entire immune system.

*The role of T cells*

You may hear psoriasis referred to as a "T-cell mediated disease." T cells are a type of immune system cell (white blood cell) that have been shown to be major players in the internal process (pathogenesis) of psoriasis. T cells naturally circulate throughout the body looking for antigens, or foreign substances. The presence of the antigen, usually an outside invader like a bacterium or virus, activates the T cell, which then initiates an immune response to neutralize the antigen.

In psoriasis, activated T cells end up in the skin. It is not clear why this happens, but it could be tied to the genetic abnormality in people who develop psoriasis. T cells become activated by two necessary interactions. First, an antigen-presenting cell (APC) processes and displays an antigen on its surface, like a beacon. A T cell recognizes and targets that antigen. The specific antigen or antigens responsible for psoriasis are not known, but some infections (for example, strep throat) create an antigen believed to trigger some cases of guttate psoriasis.

When the APC "shows" the antigen to the T cell, other receptors on the APC and T cell must also interact like a lock and key for the T cell to go into action. This lock and key is called the “co -stimulatory pathway." Many new drugs called biologics work to specifically block the pathway and thus prevent T cells from becoming activated. If T cells are not activated, the immune response and the cycle of psoriasis never get started.

If the pathway isn't blocked and the T cell is allowed to become activated, an immune response is initiated that leads to the development of skin lesions. One part of this response includes the release of cytokines. These are proteins that the immune system uses to communicate messages. In psoriasis, cytokines tell skin cells to reproduce and mature at an accelerated rate. They also set off other reactions, including inflammation, the activation of additional T cells, the "recruiting" of T cells into the skin and the release of more cytokines by the skin cells themselves.

The end result is a cycle of skin cells growing too fast, moving to the surface of the skin and piling up as dead cells (the white scale). The epidermal layer of the skin thickens, and redness develops as blood vessels expand and blood flow to the skin increases.

*Modulating the Immune System*

The co-stimulatory pathways (lock-and-key sets) are an ideal place for new psoriasis drugs to short -circuit psoriasis. Beyond that, other immune system cells involved in psoriasis are also a focus of drug development.

For example, some cytokines carry inflammatory messages and help fuel the overall immune response in the skin. In psoriatic arthritis, a cytokine called "tumor necrosis factor" (TNF-alpha) is overproduced in the synovial fluid (lubricating fluid of the joints) and skin. TNF-alpha is present in increased levels, which causes inflammation and can lead to tissue and joint damage. TNF-alpha can also lead to increased immune system activity through the activation of T cells. These processes in the skin are not the cause of psoriasis, instead they appear to be the result of an underlying immunological malfunction.

On the other hand, some cytokines carry anti-inflammatory or anti-proliferation messages. These cytokines are lacking or present only in low levels in psoriatic skin. Scientists have experimented with boosting the levels of these proteins to rebalance the biochemical makeup of the skin.

Issue #0607 Class A CEU

## CEU QUESTIONNAIRE

Complete the questions below to receive 10.5 continuing education credits. All questions must be answered completely to receive credit.

1. What is psoriasis? _____
_____

2. Where on the body is psoriasis? _____
_____

3. How many Americans have psoriasis? _____
_____

4. What does psoriasis look like? _____
_____

5. Do we know what causes psoriasis? _____
_____

6. Name two possible triggers. _____
_____

7. What do skin cells do once the disease has been triggered? _____
_____

8. How many days does it normally take skin cells to mature and shed? _____
_____

9. How many days does it take psoriasis skin cells to develop? _____
_____

10. At what age does psoriasis usually happen? _____
_____

11. What is the most common type of psoriasis? _____
_____

12. Is there a cure for psoriasis? _____
_____

13. What factors determine which treatments to try? _____
_____

14. What is phototherapy? _____
_____

15. What is systemic therapy? _____
_____

16. When was the National Psoriasis Foundation formed? _____
_____

17. What does DNA contain? _____
_____

18. What happens with genes when psoriasis is involved? _____
_____

19. How was cyclosporine found to help psoriasis? _____
_____

20. What does psoriasis do to affect the immune system? _____
_____

21. What are T cells? _____
_____

22. How do biologic drugs work? _____
_____

23. What are cytokines? _____
_____

24. Why might other disease studies benefit from psoriasis treatments? _____
_____

**Please mail this CEU back to the NAHP. DO NOT FAX IT IN. Any CEUs received via fax will be discarded without credit being awarded.**

Name _____
Address _____
City _____ State _____ Zip _____
Member ID / SSN _____
Today's Date _____

**CEU Update #0607**

*National Association for Health Professionals*
*P.O. Box 459*
*Gardner, KS 66030*