

because the exact degree of the UVA effect is uncertain, broad-spectrum sunscreens that also protect against UVA are therefore most effective, if a little less ideal cosmetically.

People tend to apply less sunscreen than is needed to achieve the manufacturer's recommended SPF, which is based on the use of two milligrams per square centimeter of skin. That works out to a bit more than an ounce for a 5-foot 8-inch person, **per application!** Most people only use a half to a quarter of that amount. At those levels, an SPF-15 sunscreen has an SPF of just 3 to 7. The most frequently missed areas are the back and sides of the neck, the temples, and the ears, areas where DLE patients frequently experience problems.

People also tend to forget to reapply sunscreen after a period of time outdoors, and especially after spending time in water. It is safest to re-apply after every immersion, but in any case, the "water-resistant" or "waterproof" label on sunscreen can certainly be confusing, a situation that the Food and Drug Administration (FDA) is currently addressing. To qualify as a water-resistant product, therefore, a sunscreen must retain its SPF rating after 40 minutes in the water, while the standard for a waterproof label is 80 minutes. The FDA may soon replace the label "waterproof" with "very water resistant" so that consumers will not be misled. The FDA has also expressed concerns about the words "sunblock" and "all-day protection," as terms that can mislead consumers, and is considering banning the use of these words.

Sources of UV light other than sunlight can also cause skin problems in lupus. Thus, photosensitivity has been reported from fluorescent tube lights, which mainly emit UVA with small amounts of UVB, and from photocopiers, which emit mainly UVA and visible light. Fluorescent tubes can be fitted with acrylic shields which eliminate UVB emission, while photocopiers should not be used with the top cover up.

Finally, because car and house windows protect just against UVB, not UVA, and clouds protect only a little against either one, sun protection should not be limited just to sunny days. For windows, effective UV-blocking films are commercially available.

## The Lupus Foundation of America

The Lupus Foundation of America (LFA) was established in 1977 to educate and support those affected by lupus and to help find a cure. The organization supports research, education, awareness, patient services, and advocacy.

The LFA is also the only nationwide organization exclusively serving individuals, families and friends affected by lupus and has hundreds of local chapters and support groups throughout the country, as well as international affiliates around the world.

The LFA is a grassroots, volunteer-driven organization. Contact the LFA or the chapter that serves your area to find out how you can become involved in our mission.

For information about lupus or to locate the chapter nearest you, visit our website at [www.lupus.org](http://www.lupus.org) or call toll-free 1-800-558-0121.

Become a Lupus E-Advocate and help pass federal legislation that will benefit people with lupus. Send an e-mail message to [advocacy@lupus.org](mailto:advocacy@lupus.org) and enter SUBSCRIBE in the subject line. You'll receive periodic advocacy updates and other breaking lupus news and information.



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## Photosensitivity and Lupus

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## Introduction

Abnormal light sensitivity, or "photosensitivity," is a major feature of both systemic lupus erythematosus (SLE), which can affect any organ or system of the body, and cutaneous lupus, which is mainly limited to the skin. The two most common forms of cutaneous lupus are *discoid lupus erythematosus* (DLE) and *subacute cutaneous lupus erythematosus* (SCLE). DLE and SCLE are described in detail below.

## How common is photosensitivity in lupus?

Photosensitivity is loosely defined by the American College of Rheumatology as "a skin rash as a result of unusual reaction to sunlight." Photosensitivity (according to this definition) has been identified in 1/2 to 3/4 of people with systemic lupus; in individuals with cutaneous lupus, photosensitivity affects 50 percent of those with DLE and 70-90 percent of those with SCLE.

## How does photosensitivity show up in lupus?

Sunlight can be associated with the development of new skin lupus lesions. Flares of internal disease activity in SLE, including joint pains and fatigue, can also be triggered by sunlight.

Finally, patients with lupus who are prescribed photosensitizing medications, such as tetracycline antibiotics and a host of other medications, may also very occasionally develop "phototoxic" reactions. These will lead to easy sunburning, thereby requiring extra protection against sunlight.

## Why are people with lupus so photosensitive?

The science of sunlight in lupus is complex and poorly understood. Several studies over the last 30 years have examined the role of ultraviolet (UV) light in lupus. UV light is invisible radiation from the sun. It has a shorter wavelength than the visible light and heat we all recognize. UV is divided into UVA, UVB and UVC (which does not reach us because it is absorbed by the atmosphere).

In general, UVA mostly ages the skin and UVB mostly burns the skin ("A Ages, B Burns") although UVB also contributes considerably to skin aging and cancer. Early studies from the 1960s suggested UVB was most important in causing photosensitivity in lupus. More recent work demonstrates that UVA is also partly responsible. The nature of the UV-affected substances in the skin is uncertain; they are probably skin cell proteins and genetic material such as DNA and RNA, which then initiate a reaction in genetically predisposed individuals. This relationship is explained further below.

## How does a lupus rash develop after sun exposure?

Current theory, based on experimental evidence, is that UV light causes skin cells to express particular proteins on their surface. These proteins, including one called "Ro," may then be the targets of antibodies which latch on to them. The attached antibodies are thought to attract white blood cells which attack the skin cells, leading to the inflammation that causes the rash.

In all individuals, skin cells that are sufficiently damaged die through a process known as programmed cell death, or "apoptosis," a normal action that allows the body to eliminate such cells. In lupus, however, apoptosis in the skin seems to occur more readily than it should, which may promote the development of inflammation.

Another contributor to the lupus rash may be that too much of the inflammation-promoting substance, nitric oxide, may be made in lupus skin after sun exposure, leading to further redness and inflammation.

The underlying reasons for these abnormal reactions (beyond a genetic tendency to them) are unknown, but a significant amount of potentially exciting research is ongoing in this field.

## What do the different lupus rashes look like?

The facial "butterfly rash" of SLE (also known as acute cutaneous lupus erythematosus, or ACLE) often comes on after sun exposure and is associated with flares of the underlying SLE itself. It occurs over the cheeks and nose and usually heals without scarring within weeks.

The term "discoid" in DLE refers to the lesions of the disk-shaped rash which occur mainly on sun-exposed sites. These lesions develop slowly and heal over several months. Discoid lupus may lead to scarring.

Subacute lupus (SCLE) is the other major type of skin lupus. It is highly photosensitive and usually takes the form of multiple, red, circular shapes on the chest, back and arms. Often a little scaly and resembling psoriasis, this form of lupus is particularly associated with antibodies in the blood to the Ro protein (mentioned above). SCLE tends to heal over weeks or months and is usually non-scarring, but frequently recurs with further sun exposure.

Both SCLE and DLE may occur on their own without the presence of systemic lupus. However, SLE occasionally develops in individuals who first have DLE or SCLE, although it tends to be a milder illness than the usual form of SLE.

## How can you protect yourself against ultraviolet light?

Whatever the weather, avoidance of tropical sun or the sun in the middle of the day is the first line of defence, and may reduce the need for other treatments. However, avoidance of the tropical or mid-day sun may not be practical in all situations or for all people. If you must be out in the sun, broad-brimmed hats and tightly-woven, loose-fitting clothing with long sleeves and long pants are very effective.

The use of sunscreens forms the next and best-known component of sun protection. Such preparations are either chemicals which absorb UV light, or pigments such as titanium dioxide or zinc oxide which scatter UV light. The sun protection factor (SPF) displayed on sunscreen products indicates the number of times skin damage is reduced when the screen is applied, regularly and liberally, before and throughout exposure (see below). Such protection relates mostly to UVB, which probably is the most important cause of lupus-related skin disease. But,