



Department of Dermatology

## PATIENT NEWSLETTER

Volume 1, Issue 3  
Summer 2001

---

### Sun Protection and Sunscreens — Saving Your Skin During Spring and Summer Fun —

When it comes to sunlight, we human beings are in quite a pickle. A sunny day can be a psychological lift to everyone. In addition, most everyone enjoys some type of sunny weather outdoor activity such as gardening, hiking, fishing, water skiing, snow skiing, golf, tennis, etc. However, most everyone also now knows that excessive exposure to sunlight can do nasty things to one's skin. These include sandpaper-like scaly spots (actinic keratosis) that can later turn into common skin cancers (squamous cell carcinoma), life-threatening black mole skin cancer (malignant melanoma), skin color changes like liver spots (solar lentigo), and premature wrinkles and loose skin (photoaging) (see **Table 1** at end of newsletter). Thus, the dilemma! How can we enjoy those uplifting sunny days throughout the year without causing permanent damage to our skin? To help our patients cope with this problem, we have prepared the following information that we hope you will find informative and useful.

**How the sun can harm your skin.** There are many different types of rays present in sunlight. The sun rays that are most damaging to the skin are called "ultraviolet (UV) rays." There are two basic types of ultraviolet rays that reach the earth's surface — UVB and UVA. UVB rays are responsible for producing sunburn. The UVB rays also play the greatest role in causing skin cancers, including the deadly black mole form of skin cancer (malignant melanoma).

UVA rays also play a role in skin cancer formation. In addition, the UVA rays penetrate more deeply into the skin and play a greater role in premature skin aging changes including wrinkle formation ("photoaging"). There are approximately 500 times more UVA rays in sunlight than UVB rays. Therefore, in addition to protecting your skin from the effects of UVB rays, it is also very important to protect it from the damaging effects of the more numerous UVA rays. Traditional chemical sunscreen products have been more successful at blocking UVB rays than UVA rays.

**How to physically protect your skin from damage by sunlight.** You should avoid direct sun exposure and artificial tanning devices as much as possible. One should be especially

careful to avoid midday sun exposure. Midday summer sunlight has the greatest concentration and intensity of UVB and UVA rays. ***A useful rule of thumb is that if your shadow is longer than you are tall there is less danger from the damaging effects of UV rays.*** This generally applies before 10 AM and later-than 4 PM in the spring and summer months. It is also a good idea to check the UV Index each day and dress accordingly. The UV Index is a prediction of the sun's UV ray strength on any given day at noon in a particular geographic region. The local daily UV Index is usually available via the local newspaper, television or radio. It can also be found on the Internet at the following address  
([www.cpc.ncep.noaa.gov/products/stratosphere/uv\\_index/uv\\_current.html](http://www.cpc.ncep.noaa.gov/products/stratosphere/uv_index/uv_current.html))

Harmful UV rays can also reflect off water and light colored surfaces (e.g., concrete, sand, and snow). This can double the amount of UVB rays that strike your skin. UV rays also reach below the surface of water — three feet of water blocks only 20% of UV rays. Sunscreen should be used even on cloudy days when up to 80% of UV rays can still reach the earth's surface. In addition, repeated small exposures to UV rays may account for 80% of total exposure over a lifetime. Daily use of a sunscreen is very important since intermittent application is much less protective. You should wear lightweight, tightly-woven clothing and broad brimmed hats. Another source of sun protection advice is available online at (<http://tray.dermatology.uiowa.edu/SafeSun/SafeSun-Index.html>).

When comparing products that protect the skin from the harmful effects of UVB rays, the term "***sun protection factor (SPF)***" is often used. For example, if you used a sunscreen having a sun protection factor of 5, then theoretically you could stay outside in the sunlight five times longer before getting a sunburn compared to the time required to get a sunburn without using the sunscreen. The SPF relates only to the ability of a sunscreen to block sunburning UVB rays. The SPF number does not relate to the ability of a sunscreen to block UVA rays.

A hat brim of 4 inches or greater is recommended and you should make certain that the top and brim of a straw hat have sun-proof liners in place. Small-brim hats (less than 1 inch) provide a sun protection factor of 1.5 for the nose and minimal protection for the chin. Broad-brim hats (greater than 3 inches) provide a SPF of 3 for the cheek, SPF 7 for the nose, SPF 5 for the neck, and SPF 2 for the chin. There are lightweight plastic hats that are commercially available and designed specifically to provide a physical block to UV radiation (e.g., Sun Helmets [[www.sunhelmets.com](http://www.sunhelmets.com)]).

Typical summer shirt fabrics only offer SPF of 6.5. Weave tightness is the most important factor in sun protection of fabrics followed by the fabric type. Cotton and polyester/cotton blends offer comparable protection. When stretched, Lycra fabric is significantly less effective than when it is lax. Darker color fabrics provide greater protection from UV rays than do lighter color fabrics. It is also important to note that fabrics are significantly less photo-protective when wet. Several clothing lines offering maximized UV protection (e.g., SPF 30) are currently being marketed and are easily accessed through the Internet (e.g., Solumbra Ultra Sun Protective Clothing [[sunprecautions.com](http://sunprecautions.com)]; Frogwear Sun Protective Clothing [1-800-328-4440]; MasqueRays [[sunproof.com](http://sunproof.com)]; Sun Protective Clothing

[sunprotectiveclothing.com]; SunGrubbies [sungrubbies.com]). Such sun-protective specialty clothing is also marketed for fishermen and those going on safaris. Unfortunately, such specialty clothing lines tend to be quite expensive.

For maximal UV protection, acrylic diffusion shields should be placed over bare fluorescent light tubes/bulbs at home and at work to block the small amount of UV irradiation that can leak from such light sources (UVA greater than UVB). In addition, UV blocking plastic adhesive films can be applied to home and automobile windows. A number of companies offer UV light blocking films or plastic shields that can be applied to home and automobile windows. This is important because whereas window and car glass material may offer some shielding against UVB rays, they are transparent for UVA rays. More information on these products can be obtained through the Internet (e.g., Solis Films [southwall.com]; North Solar Screen [northsolarscreen.com]; Llumar UV shield window film [llumar.com])

**Use of sunscreens.** The ideal, state-of-the-art sunscreen should have a high SPF rating and be well-tolerated, cosmetically pleasant, non-toxic, equally effective against UVA and UVB, photostable, water-resistant, and inexpensive. Unfortunately, no single such sunscreen currently exists, however there are a number of very useful products on the market.

Patients should select broad-spectrum sunscreens that contain agents that effectively block both UVB and UVA rays with an SPF of 30 or greater. A SPF 15 sunscreen blocks 92% of UVB rays while a SPF 30 product blocks 96% of the UVB rays. It has been found that much lower amounts of sunscreens are actually used in real life situations compared to the amounts employed under lab conditions for determining the SPF rating of a specific sunscreen product. In fact, in real life conditions individuals usually apply only between 20-50% of that amount of a sunscreen product that was used to determine the SPF of the product. Therefore, when you use a SPF 30 sunscreen in real life, in reality you probably get a SPF of about 7-15. The efficacy of sunscreen will be optimized if the ideal amount of sunscreen is applied. For the average size adult, a minimum of one ounce of sunscreen should be used for adequate total body coverage.

Sunscreen should be applied daily to dry skin about 15 to 30 minutes before going outdoors. Products that are most resistant to being washed off by sweating or bathing should be selected. ***Water-resistant sunscreens*** protect skin for 40 minutes of water exposure whereas ***waterproof sunscreens*** protect for 80 minutes. Gels work well for oily skin or when sweating. Lotions help dry skin and sprays work best on the body. Stick-type sunscreens that are formulated for use on the lips can also be applied around the eyes to avoid the eye irritation that often occurs when other products are applied to this area. Stick-type sunscreens can also be used to gain maximum sun protection to the ears.

The use of sunscreens that offer good UVA protection is important because there is a very large amount of UVA rays in sunlight. In addition, considerable exposure to UVA rays can even occur in the shade. The broadest degree of protection from sunlight is provided by high SPF sunscreen products (SPF 30 or greater) that also contain good UVA blockers. Natural

pigments such as titanium dioxide and zinc oxide are good UVB and UVA blockers. In the past, sunscreens containing titanium dioxide or zinc oxide were not popular because they were opaque and thus quite unsightly when applied to this skin. However, modern sunscreen formulations containing micronized versions of these pigments are now much more pleasing to individuals. Today, certain chemicals can be added to sunscreen products to give them good UVA ray blocking abilities. Such chemicals include Parsol 1789 (avobenzone) and Mexoryl-Sx.

Foundation makeup products without sunscreen may not offer more than a SPF of 4 via its pigment content. However, most of the company lines now offer cosmetic products that contain sunscreen chemicals offering various SPF levels up to 15-30.

Our specific recommendations of sunscreen products that were commercially available at the end of the year 2000 in North America are categorized in **Table 2** at the end of this newsletter. American dermatologists frequently recommend these products because they less often cause harsh side effects on the skin. Some "store-brand" sunscreens that have the same or similar chemical composition compare quite favorably in protection to brand name products like those shown in **Table 2**. However, the "store-brand" sunscreens are often about one-fourth the price of the comparable brand name products.

**Is there a Safe Way to Tan?** Good news, the answer is "Yes." However, it is not the kind of tan you get from sunlight or a tanning booth. In fact, it is not really a tan in the true sense of the word (a true tan is a darkening of the skin caused by increased melanin pigment formation that results from damage to the skin caused by UV rays). By using a "quick-tanning" product containing a chemical called dihydroxyacetone, it is possible to temporarily darken the surface of the skin in a way that can simulate the appearance of a true tan. However, these quick-tanning products do not injure the skin the way that UV rays do. In fact, some light rays are actually blocked to a small degree by the use of a quick tanning product. One drawback of a quick-tan is that it fades quicker than a regular tan. However, the skin surface will again quickly darken after reapplying the quick-tanning product. Quick-tanning products have traditionally been made available in the form of creams or lotions that are applied to the skin. However, a new product call "Mystique Tan" has recently appeared in tanning salons that is sprayed on the entire skin surface (much like taking a shower) in order to get a uniform quick-tanned appearance all over.

**Photosensitivity (abnormal reactions to sun exposure).** It is quite normal for light-complected individuals to develop a sunburn if they stay out in the sun long enough without using sunscreens. However, certain individuals react abnormally to sunlight. For example, rather than developing a simple sunburn, they might develop a sun-induced rash. Such an abnormal reaction pattern to sunlight can be caused by a number of medical problems. Certain types of medications taken by mouth can cause the skin to become extra sensitive to the effects of UV rays. Some autoimmune diseases such as systemic lupus erythematosus cause patients to develop photosensitivity. If you feel that your skin is reacting differently to sunlight exposure

compared to those around you, you should consult a dermatologist or your family physician to determine the cause of your photosensitivity.

***Table 1***  
**Skin problems that can be caused by excessive,  
long-term sun exposure to exposure to sunlight**

**Non-cancer**

**Photoaging**

Skin color changes:

Solar lentigo:

Tan or brown spots on sun-exposed parts of body, especially backs of hands

Premature wrinkles

Loose, irregular skin

**Pre-cancer**

**Actinic keratosis**

Rough, sandpaper-like, scaly skin spots that can later turn into skin cancer

**Cancer**

**Basal cell carcinoma**

The most common form of skin cancer. Spreading (metastasizing) to other parts of the body is very unlikely. Best treated when detected early. Can be cured with proper treatment.

**Squamous cell carcinoma**

Next most common form of skin cancer. Spreading (metastasizing) to other parts of the body is also very unusual. Best treated when detected early. Can be cured with proper treatment.

**Malignant melanoma**

The life-threatening form of “black mole” skin cancer. Early treatment can be curative. High likelihood of spreading to other parts of body if not treated early. Often causes death if treatment is delayed.

**Table 2**  
**Sunscreens available in North America listed by class**

**Broad-spectrum UVA/UVB sunscreens containing Parsol 1789**

Cetaphil Daily Facial Moisturizer SPF 15  
 Coppertone Shade Spray Mist SPF 30  
 Coppertone Shade Sunblock Lotion SPF 30/45  
 La Roche-Posay Anthelios “L” Cream SPF 60  
 Ombrelle Sunscreen Lotion/Spray SPF 15/30  
 PreSun Ultra Lotion/Gel SPF 15/30  
 SolBar AVO SPF 32

**Moisturizer/sunscreen combinations**

Cetaphil Daily Moisturizer SPF 15  
 Elta Block SPF 30/32  
 Eucerin Daily Lotion SPF 15/25  
 Keri Skin Renewal SPF 15  
 Lubriderm Daily UV Lotion  
     with Sunscreen SPF 15  
 Neutrogena Healthy Skin SPF 15  
 Neutrogena Moisture SPF 15  
 Oil of Olay Daily UV Protectant SPF 15  
 Purpose Dual Moisturizer Lotion/  
     cream SPF 15

**Sunscreens for very sensitive skin (generally contain titanium dioxide or zinc oxide)**

Clinique City Block SPF 15/25  
 DuraScreen SPF 30  
 Elta Block SPF 30/32  
 Estee Lauder Sunblock SPF 15/30  
 MD Forte Total Daily Protector SPF 15  
 Neutrogena Sensitive Skin Sunblocker SPF 17  
 PreSun Sensitive Block SPF 28  
 Vanicream SPF 15/35

**Waterproof/sweat-resistant sunscreens**

Coppertone Shade Spray Mist SPF 30  
 Coppertone Sport spray/stick SPF 15/30  
 Elta Block Super Waterproof SPF 30  
 La Roche-Posay Anthelios “S” cream SPF 30  
 Neutrogena Sunblock spray/stick SPF 20/25  
 PreSun Ultra Spray SPF 27  
 SolBar cream SPF 50

**Sunscreen for lips or eyelids**

ChapStick Ultra SPF 15/30  
 Coppertone Lipkote SPF 15  
 Coppertone Shade Sunblock Stick SPF 30  
 La Roche-Posay Antherpos Ceralip SPF 50  
 Neutrogena Lip Moisturizer SPF 15  
 Neutrogena Sunblock Stick SPF 25  
 PreSun Lip Protector SPF 15

**Oil-free sunscreens for those prone to acne**

Clinique Oil Free Sunblock SPF 15  
 Coppertone Shade Oil-Free Gel SPF 30  
 Neutrogena Oil Free Sunblock Lotion SPF 30  
 Neutrogena Sunblock Spray SPF 20  
 Ombrelle Sunscreen Spray SPF 15