



**Q.** When I was a teenager I relocated with my family to a tropical island for one year. During that time, I had a couple of blistering sunburns, which I still remember very well. I am fair-skinned, of Polish descent. Could this have led to the melanoma I recently developed on my shoulder?

*A. There is no question that a blistering sunburn can be associated with skin cancer. If you've had such experiences in childhood you should pay special attention to monitoring for the early signs of skin cancer.*

**W**e often take our environment for granted. We believe that, like the weather, there is little we can do about it. It is only when we are confronted with changes we don't expect (such as the aging of our skin) or a medical problem we didn't anticipate that we suddenly become aware of the fact that we can run but we cannot hide. When it comes to the effects of the sun on the skin, this is especially true.

Sun is the source of all life on earth. Without it, we might as well be living on Mars: no flowers, no wheat, no bread, no life. Ancient Egyptians worshiped the sun,

### IS FUN IN THE SUN DUMB?

It seems to be for one particular group: women between the ages of 16 and 24. These are the most frequent patrons of tanning salons. Guess what group has demonstrated the greatest increase in melanoma incidence? Women ages 24 to 35. While the link between sun exposure and melanoma is not as strong as that between ultraviolet radiation and non-melanoma skin cancer, this statistical observation probably represents a serious problem for women who seek youth and health in tanning salons, and in the end will age prematurely and may get cancer.

French monarchs adopted it as their icon (remember the Sun King?), and today we talk of a different kind of sun worshiper: the kind who “pray” on ocean beaches, mountain lakes, and even urban rooftops.

Even people who have had skin cancer cannot ignore the fact that we do *like* the sun. Lying out on the beach under an endless blue sky or feeling the warmth of the sun on our shoulders is a pleasant experience. The tingling warmth of the sun on our face somehow makes us feel alive. We enjoy the sun, I think, because it makes us feel good, and because deep down, rooted somewhere in our psyche, it makes us feel vital.

Research on seasonal affective disorder, or SAD, indicates that sunlight plays an important role in our moods and daily biorhythms. Through a complex process sunlight acts on a small gland between and behind our eyes, called the pineal gland, to make sure that our hormone system cycles properly throughout the day and night. When changes in the cycles of light and dark occur, our mood changes. Think about why we welcome Santa Claus and his reindeer to brighten the northern skies in winter. The short days and long nights of the North Atlantic nations make winter a dreary time. Something was needed to compensate for the lack of sunlight. Feasts of Saturnalia, decorations, special foods, gifts—what better way to fight off the blues of a dark and dreary winter?

Our love of the sun permeates our lives, our language: “My, that child has a sunny disposition,” we might be heard saying. For this reason it is very hard to convince people that the sun has a dark side. Were this not the case, Club Med would have resorts in caves and architects who design buildings without windows would be the most sought after in the world.

The attraction of the sun goes beyond how it feels. It has to do with its

### WHAT IS SPF?

This is what “SPF” means: a product with a Sun Protection Factor (SPF) of 15 allows you to stay in the sun 15 times longer than you normally would be able to before getting red. An SPF 30 allows you to stay out 30 times as long. If you normally get red after 10 minutes, an SPF 30 should allow you to stay in the sun 300 minutes ( $30 \times 10$  minutes) before turning red. The problem with these ratings is that they are inexact.

**SOLUTION:** Find a product you like and determine how much protection one application provides. Then, apply regularly at proper intervals being certain to apply the sunscreen about 30 minutes before first going outdoors.

tanning effect as well. Isn't it a little strange that so many of us, whether we are light or dark-skinned, seem to have this overwhelming desire to literally change our color? Those who are pale want to grow dark, and in many cultures, those who are dark want to grow pale so intensely that they will use strong bleaching creams and ointments to try to do so. This desire to change color is also reflected in the attraction of opposites. When Fletcher Christian arrived in Tahiti with his mutinous crew of the *Bounty* he discovered that the Polynesian women were fascinated by the fair-skinned Europeans who washed up on their shores. Their descendants on Pitcairn Island, where they settled, now attest to the fact that the attraction went well beyond fascination.

It's ironic that the vanity element of sun worship, the bronze tan, has such blatant historical contradictions. *Gone with the Wind* is a good example. What fashion accessory was most notable among the fine women of Atlanta? The parasol! It was such an important defense against developing a tan that the name of a currently used sunscreen chemical, *Parsol*, may not be a complete accident. In the South and elsewhere until the turn of the century, having a tan was considered a sign of low class. A tan suggested that you were a laborer, someone who toiled outdoors, not a person of leisure and wealth. Scarlett O'Hara was not allowed to show her bosom before three o'clock so that she wouldn't get freckled. This value extends back in time to before the Victorian era, when the rough, sun-hewn skin of laborers was easily identified as a social nonstarter. But in our century something happened—through changes in fashion, advertising, and proba-

bly leisure time—a tan came to symbolize glamour, health, and wealth. The cartoon strip *Doonesbury*, for instance, got enormous mileage out of the actor George Hamilton's obsession with tanning. Month after month, *Doonesbury* wryly poked fun at the silliness of tanning, using it as a metaphor for vanity. Now we can add danger to that as well.

Here are some cold facts about radiation from the sun. Known to doctors and scientists as UVR, ultraviolet radiation from the sun is something we can't feel (it is *not* the warmth we feel from the sun), can't see, can't smell, and can't reach out and catch. But its power is inescapable.

On a day-to-day basis we may encounter many different types of radiation. There is ultraviolet radiation from the sun, X-rays used in CT scanning, and microwave radiation we use in cooking. Even radio waves are a form of non-harmful radiation. Ultraviolet radiation from the sun actually refers to two main types of UVR—UVA, or long wave UV radiation, and UVB, which has a shorter wavelength.

When radiation is emitted from the sun, it is transmitted to the earth's surface. When it is absorbed by the skin, it can prematurely age the skin or even lead to skin cancer. The best way to minimize one's exposure to UVR is to stay indoors for life. This is not only impractical—it would be harmful in other ways: it would prevent us from leading a normal social existence. It has been suggested that people may be at risk from low-intensity ultraviolet radiation emanating from the fluorescent or halogen lamps used in offices and homes. However, there is no scientific evidence that this exposure can lead to cancer. While medical history is filled with examples of new information developing down the road when better measuring techniques become available, I believe that exposure to normal indoor lighting is not a risk for skin cancer or premature aging.

The power of sunlight has become especially worrisome because many believe that thinning of the ozone layer, caused by the release of chlorofluorocarbons into the atmosphere, now permits more of the sun's radiation to reach the earth's surface. Therefore, more UVR rays reach our skin. While there is some debate about how quickly the ozone layer is depleting, and what its real impact is on UVR penetration, it is likely that the increased strength of these rays accounts in some part for the increase in skin cancer that we are seeing throughout the world. In fact, ultraviolet B (UVB), the cancer-causing rays, now reach the earth's surface in greater levels than ever before. It is estimated that for every 1 percent decrease in the ozone layer, there is a 6 percent increase in the incidence of non-melanoma skin cancer such as basal cell cancer and squamous cell cancer.

UVR has been linked to other health problems as well, most notably cataracts and depression of the immune system.

Too much sun can also damage our DNA, the essential building block of all life, which among other things directs our cells to make key proteins. When the sun damages your DNA, the ability of DNA to produce proteins is altered. Certainly repair of sun-damaged DNA is part of the body's biological repertoire, but this capacity is not endless. A few years ago, Douglas Brash, Ph.D., a researcher at Yale, and I studied tissue from my skin cancer patients. With the help of one of Brash's lab assistants, it was determined that UVR was the sole cause of a specific mutation in the cells of the top layer of the skin we studied. This mutation, in which the DNA was altered, could only have been caused by UVR. Ciga-

#### SOME MEDICATIONS THAT DON'T MIX WITH SUN

- Doxycycline (Vibramycin, Monodox)
- Furosemide (Lasix)
- Tetracycline
- Sulfonamides (Bactrim, Septra, gantrisin)

There are others. Check with your doctor.

rette smoke couldn't cause it, toxic waste couldn't cause it, bad thoughts couldn't cause it. By studying the skin cancers and pre-skin cancers of patients we also discovered not only that UVR from the sun caused this mutation in a gene called p53, but that damage to this change in the gene likely resulted, eventually, in the development of skin cancer. For the first time, we understood how the sun actually damages the skin and causes skin cancer.

Having identified at least one important step in this process, it now has become possible to explore ways to reverse this damage and even, ideally, prevent it. Several exciting compounds are now being developed that will probably in time do away with the need for most surgical treatment of many skin cancers and, more important, provide a true sun protection, one that is more than a sunscreen or a sunblock. It could actually reverse the genetic injury before it has a chance to lead to skin cancer. I've called this agent the *morning-after cream*. Too much volleyball on the beach? Too much unprotected golf or tennis? Apply the cream that reverses the DNA mutations and you should be able to stop the development of skin cancer dead in its tracks. A medication that can accomplish this is now the goal of many skin cancer researchers, and active clinical trials are now in progress (see [www.totalskinmd.com](http://www.totalskinmd.com)).

## ▪ SUNBURN

Minor sunburns are just that—minor. But if you are out in the sun for a long period of time your skin needs a lot of protection, including sunscreen, a hat, and adequate clothing. Without such protection, after hours in the sun you could end up with a burn severe enough to cause swelling and chills, necessitating a doctor's attention.

Severe sunburns often occur because the effects of the sun's rays do not appear for a few hours. Consequently, a person can't tell that he or she is getting a burn and continues to bask in the sun while the burn worsens. In fact, the full effect of sunburn is usually not felt until eighteen hours after the exposure. Because the sun doesn't warn us the way the heat of a flame does, the damage caused by sunburn can be as bad as, or even worse than, that caused by most minor heat burns. In addition, there are many medications that can make sunburn worse. If you are taking any medications, check with your doctor to find out whether what you are taking increases your sensitivity to sunlight; or see if they're listed in the box on page 95.

Symptoms of sunburn include red and tender skin, swelling, blistering, pain that worsens when the skin is touched, and increased sensitivity to any amount of heat. If the sunburn is severe enough, you may experience nausea, vomiting, dizziness, and flulike symptoms.

Obviously, the best policy is to avoid sunburn in the first place. However, even the most cautious of us sometimes make mistakes, so here is what to do if you or someone you are with is suffering from the effects of sunburn. First, cool off; since even a cool shower may be too painful, immerse yourself in a tepid to cool bath. Adding colloidal oatmeal (Aveeno) may be soothing. (Showering can make the sunburn more painful.) Second, treat the sunburn with an over-the-counter hydrocortisone cream to reduce the inflammation and encourage healing. You may prefer creams rather than ointments because they are moisturizing as well. The use of aloe vera gel is popular and it has a soothing effect. Commercial preparations of gel derived from aloe vera may help alleviate the discomfort. In some cases of severe sunburn, your doctor may prescribe oral prednisone, a form of corticosteroid, to reduce the pain and swelling. Non-steroidal anti-inflammatory medications such as Motrin (ibuprofen), may also help control the discomfort. Never use aspirin in children because of the risk of Reye's syndrome.

### TREATING YOUR SUNBURN

1. Take a tepid bath with colloidal oatmeal (Aveeno).
2. Rest in a cool room.
3. Take aspirin (*adults only*) or ibuprofen to control discomfort.
4. Keep well hydrated.
5. Apply hydrocortisone cream 1% (over-the-counter) two to three times day.
6. Apply moisturizers liberally (make sure your moisturizer doesn't contain alcohol).
7. Promise yourself you will be more careful next time.

This list of simple tips should help keep your relationship with the sun healthy and damage-free:

- Whenever possible, avoid spending time in the sun between the hours of 10 A.M. and 4 P.M. The sun is most intense during these hours. Remember to correct for Daylight Savings Time.
- Avoid spending long periods of time in the sun. If it's possible to find shade or go inside for a few minutes, do so. If you're playing eighteen holes of golf and a little siesta indoors is out of the question, take shade breaks under a tree whenever possible.

### BABY, THE SUN, AND YOU

It has been reported that the average person receives 85 percent of the sun exposure he or she will have in a lifetime by the age of eighteen. Children's skin is more susceptible to sun damage. For these reasons PROTECT YOUR CHILDREN FROM THE SUN. This point was driven home to me after we had our first child, who is very fair-skinned. His baby-sitter took him out for a stroll when he was about two years old. Later that night I noticed his lower shins were sunburned. I remembered the saying about the shoemaker's children going shoeless, and from that day on made sure that our children used sunscreen and avoided excessive sun exposure. Now my kids chastise me if I forget to apply my sunscreen.

- Wear a waterproof sunscreen with an SPF of 15 or more, depending on how fair your skin is.
- Make sure your sunscreen provides “broad-spectrum” protection, blocking both UVA and UVB rays.
- Wear your sunscreen in the winter as well, particularly if you engage in outdoor sports such as skating, skiing, or snowboarding.
- Apply your sunscreen prior to going out in the sun, and don’t skimp on the amount you use. Similarly, you needn’t overdo it. A thin, but thorough coating is sufficient.
- Don’t forget your lips. Use a lip balm containing a sunscreen that protects against both UVA and UVB rays.
- Keep babies covered and in the shade. If there is no shade, bring a parasol or umbrella. Bonnets are a great accessory for infants and toddlers.
- Especially for children, consider special sun-protective clothing, especially a hat (see Appendix 4: Selective Guide to Skin Care Products).
- Never, never, never use a tanning parlor.

## ▪ PERMANENT SKIN CHANGES AND THE SUN

When the repair mechanisms in our DNA become unable to keep up with the pace at which ultraviolet radiation damage is occurring to the skin, we begin to see permanent changes in the skin.

For one thing, *actinic keratoses* develop. These are irregular, scaly patches of rough skin, which are usually pink to red. Liver spots or sun spots, tan or brown patches that appear most frequently on the face, backs of the hands, and other parts of the body, also develop. Other common signs of “photo-damage” (*photo* is Greek for light) include broken blood vessels, wrinkles, and in the extreme case yellow pebbling of the skin which resembles chicken skin.

*Loss of elasticity* is also a major factor that makes the skin look old.

### SUNSCREENS VERSUS SUNBLOCKS

**Sunscreens** are different from sunblocks. Sunscreens contain active chemicals such as benzophenones (e.g., oxybenzone), cinnamates, salicylates (octyl salicylate). A few may even still contain PABA (para-aminobenzoic acid), a compound some people are allergic to. Sunscreens prevent sun damage by chemically absorbing the energy of the ultraviolet radiation before it can bombard the epidermis.

**Sunblocks**, such as zinc oxide or titanium dioxide, actually physically block the radiation, reflecting it off the skin. Blocks are less likely to cause allergic reactions and are sometimes called “chemical-free.”

Because of UVA rays, excessive sun exposure causes the loss of elasticity in the dermis. In animals, just a few exposures of UVA, similar to that which a teenager might get on a tanning bed, blows important elastin tissue to pieces. Under the microscope, one can see the fragments of elastin tissue dispersed in a helter-skelter fashion. To simulate this, cut an elastic band into quarter-inch pieces and see how well it snaps back! Elastin tissue damaged in this way will never help the skin snap back into shape. And skin that doesn't snap back is wrinkled forever.

#### ▪ PROTECTION IN WIND AND COLD

Summer sun is not the only environmental danger to which we expose our skin. Cold, wind, and even winter sun can be damaging and take their toll on the health, appearance, and comfort of our skin.

*Frostnip*, the earliest stage of frostbite, is reversible. When frostnip occurs, the skin becomes white or icy to the touch and becomes less

#### PREFERRED SUNBLOCKS

Neutrogena Chemical Free  
(titanium dioxide)  
Sundown Sunblock Ultra  
Baby Garde Sunblock Lotion

#### PREFERRED SUNSCREENS

Ombrelle  
Sundown  
Bullfrog  
Waterbabies  
Presun

### IS SPF JUST A NUMBERS GAME?

A product with SPF 15 blocks about 96 percent of UV rays. A product with an SPF of 30 blocks about 97 percent of UV rays.

The higher the SPF number, the less additional protection you get.

Use an SPF rated at least 15 and apply it regularly. Leave the bottle in a place where you'll be reminded to use it.

sensitive. Unlike frostbite, frostnip is easily treated. The best way to do this is to make sure the affected area is dry and then press it against an area of skin that is warm, such as under the arm, if accessible, or against the abdomen. If frostnip occurs on the toes, rub your hands together until they are warm and wrap the toes in your fingers. Most important, anyone suffering from frostnip should get out of the cold. Further exposure to the cold will cause the condition to deteriorate quickly into frostbite, which can cause permanent damage to the skin.

*Frostbite* occurs when the skin is exposed to extremely cold temperatures for long periods of time. Under these conditions, the skin and the underlying tissues actually freeze. The areas most commonly affected by frostbite are the nose, ears, feet, and hands.

Though 32 degrees F is considered the freezing temperature, internal body temperature must fall to a temperature far lower than that before tissues in certain areas begin to freeze. Frostbite is much more likely in people suffering from dehydration and lack of adequate food, clothing, or shelter. In addition, excessive exposure to wind or wet weather may hasten the onset of frostbite.

The skin of someone suffering from frostbite will look pale, and white patches that are cold to the touch may appear. Sometimes the affected area may be numb, but it may also ache. When the skin begins to thaw, the area will feel raw and there will be moderate to severe pain, depending on how long the skin has been frostbitten. As with many skin conditions, treating frostbite can be simple or difficult, depending on the severity of the condition. Obviously, the best chance of a full recovery occurs when the skin has been frozen for only a short period of time.

To begin treatment, allow normal body temperature to be restored. Never attempt to thaw frostbitten flesh until body temperature has been normalized. If frostbite is severe and it is possible to obtain emergency ser-

vices, you should call EMS. If this is not possible, the current choice for treating frostbitten hands or feet is to submerge the affected area in warm water—do *not* use hot water!—to thaw the area rapidly. Temperatures that are easily tolerated by normal skin can burn frostbitten skin, so avoid using a heating pad. As the skin thaws, the frostbitten person should feel tingling and burning sensations in the affected area. This indicates returning circulation. If the area remains numb, you must seek emergency treatment. The time it takes skin to thaw depends on the depth of the freezing. The thawing process is complete when the area flushes, or reddens. In some cases, permanent scarring and chronic temperature sensitivity may result after frostbite.

## ▪ DRY SKIN

Everyone experiences dry skin at some point in life, some more than others. In the modern world, dry skin has become so prevalent that dermatologists even refer to it by the fancy name of *xerosis*. One nickname for dry skin is “winter itch,” because it occurs most frequently in the fall and winter, when the humidity level tends to be low. Severe dry skin usually appears in areas where the number of oil glands is low, such as the trunk, arms, and legs. As we age, our oil glands slow down (like everything else!) and our ability to keep our skin moist is affected. So significant is the change in skin as we age that dry skin is a major problem in older patients. When dryness of skin is combined with the natural thinning of skin that occurs over time as well, scratching can lead to superficial skin infection. Preventing dry skin at all ages is important for comfort; in the older patient, keeping skin moist will also prevent a vicious cycle of scratching and infection.

In general, as the skin dries out, the dead cells of the epidermis harden.

### FOR CHAPPED LIPS AND CRACKED SKIN

**Aquaphor®**

**Vaseline** (petroleum jelly)

**Curel Skin Healing Stick**

**Bag balm:** Used by farmers to treat irritated cow udders. Some people consider this product excellent for chapped lips. Contains lanolin.

With time, this harder layer of skin is likely to crack in places, causing the itching associated with very dry skin.

While dry skin may occur more frequently in the winter months, there are other contributing factors to the condition. For example, the excessive use of soap can deplete the skin surface of the fatty molecules that help retain moisture. People who wash their hands frequently—a health care professional, an artist who works with clay, or a homemaker who cooks most meals—may find they have extremely dry chapped hands because of frequent washing.

Excessive bathing may also dry out skin. Indoor plumbing (and the resultant ability to bathe daily) is a great mark of human progress, but as with all aspects of life you can have too much of a good thing. Bathing daily can cause skin to become drier and drier (and it's worse for people who exercise frequently and then take two showers a day, or a bath and a shower).

But that doesn't make sense, you say. Water is wet, the opposite of dry. How can bathing in wet water make your skin dry? Simple—think about the process of evaporation. As you towel off, room air helps dry you through evaporation. The added dryness from this process also saps the skin of its intrinsic moisture. Therefore, too much washing, whether it be in the form of showers or baths, results in dry skin.

What to do? Moisturize, moisturize, moisturize. While using a moisturizer on your face will not retard the aging process, using a good moisturizer on your body after your bath or shower will minimize dry skin. If you love to relax in a bath, add a bath oil—not bubble bath—to the water to keep your skin from drying. When you're showering just to get clean, make it fast. Don't use hot water. Not only will you minimize the chances of itchy dry skin, you'll be saving water, which will please your children and ardent environmentalists.

#### INDUSTRIAL-STRENGTH MOISTURIZERS

If you need extra-strong moisturizers use those that contain either urea or lactic acid.

##### **Lactic Acid**

Amlactin

Lac-Hydrin

##### **Urea**

Carmol 10 Lotion

Carmol 20 Cream

**Avoid products with alcohol: they dry.**

**MOISTURIZERS FOR DAILY USE**

Avoid products with alcohol. For mild dryness, use creams; for very dry skin, ointments work well.

Neutrogena Moisture SPF 15

Eucerin Cream; Eucerin Plus

Complex 15

Moisturel

Purpose

Aquaphor (ointment)

Alpha-hydroxy acid containing  
moisturizers (may sting if skin is  
very dry or cracked)

If you wash your hands often and use an antibacterial soap, make sure it is a mild one. Lever 2000 or Dial are good products. Phisoderm is an excellent heavy-duty cleanser used by health professionals. Whatever you do, though, don't obsess about hand washing. You can take a little bit of a good thing too far.