

Aging Skin: Blemishes and Nonmelanoma Skin Cancers

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WHAT OCCURS WHEN SKIN AGES?

Aging Process

One or more benign lesions are present on the skin of virtually all individuals older than 65, and the incidence of skin cancer increases dramatically with age. Like all the body's tissues, the skin undergoes many changes in the course of the normal aging process:

- The cells divide more slowly, and the inner layer of skin (the *dermis*) starts to thin. Fat cells beneath the dermis begin to atrophy (diminish). In addition, the ability of the skin to repair itself diminishes with age, so wounds are slower to heal. The thinning skin becomes vulnerable to injuries and damage.
- The underlying network of elastin and collagen fibers, which provides scaffolding for the surface skin layers, loosens and unravels. Skin then loses its elasticity. When pressed, it no longer springs back to its initial position but instead sags and forms furrows.
- The sweat- and oil-secreting glands atrophy, depriving the skin of their protective water-lipid emulsions. The skin's ability to retain moisture then diminishes and it becomes dry and scaly.

Various blemishes and precancerous and cancerous lesions appear that are not only unsightly but potentially serious are also prevalent.

The skin is also more fragile and may bruise or tear easily and take longer to heal. [See Box [The Skin.](#)]

The Skin

The skin has three layers and consists of different cell types:

- The outer layer of the skin, the *epidermis*, is only about 20 cells deep, roughly as thick as a sheet of paper. It is composed of skin cells called *keratinocytes*. The top part of the epidermis, called the stratum corneum, or horny layer, is composed of dead keratinocytes that are constantly shed. The living keratinocytes underneath are referred to as squamous cells. The lowest part of the epidermis consists of basal cells. These are constantly reproducing to form new keratinocytes.
- Below this layer lies the *dermis*, ranging in thickness from one to four millimeters (about 1/32 to 1/8 inch). The dermis contains tiny blood and lymph vessels, which increase in number deeper in the skin.
- Cells called melanocytes are found in the transitional layer between the epidermis and dermis. These skin cells produce a brown-black skin pigment called *melanin*, which helps to protect against the damaging rays of the sun and to determine skin coloring. As a person ages, melanocytes often proliferate, forming concentrated clusters that appear on the surface as small, dark, flat or dome-shaped spots, which are usually harmless moles or liver spots.

Ultraviolet Radiation, Sunlight, and Photoaging

The role of the sun cannot be overestimated as the most important cause of prematurely aging skin (called *photoaging*) and skin cancers. Overall, exposure to ultraviolet (referred to as UVA or UVB) radiation emanating from sunlight accounts for about 90% of the symptoms of premature skin aging, and most of these effects occur by age 20:

- Even small amounts of UV radiation trigger process leading to skin wrinkles.
- Long-term repetitive and cumulative exposure to sunlight appears to be responsible for the vast majority of undesirable consequences of aging skin, including basal cell and squamous cell carcinomas.
- Melanoma is more likely to be caused by intense exposure to sunlight in early life.

[See Well-Connected Report #21 *Skin Wrinkles* and Report #32 *Melanoma*.]

UVA and UVB Radiation. When sunlight penetrates the top layers of the skin, ultraviolet (referred to as UVA or UVB) radiation bombards the genetic material, *the DNA*, inside the skin cells and damages it. Both UVB and UVA contribute to skin cancers and less serious skin

blemishes, although the mechanisms are not yet fully clear.

- UVB is the primary agent in sunburning and primarily affects the outer skin layers. UVB is most intense at midday when sunlight is brightest. Slightly over 70% of the yearly UVB dose is received during the summer and only 28% is received during the remainder of the year.
- UVA penetrates more deeply and efficiently, however. UVA's intensity also tends to be less variable both during the day and throughout the year than UVB's. For example, only about half of the yearly UVA dose is received during the summer months and the balance is spread over the rest of the year. UVA is also not filtered through window glass (as is UVB).

Damaging Effects of UV Radiation. Both UVA and UVB rays cause damage, including genetic injury, wrinkles, lower immunity against infection, aging skin disorders, and cancer, although the mechanisms are not yet fully clear. The following are some ways in which cancer may develop and some defensive actions that the skin uses to defend itself against DNA damage.

- **Oxidation and Antioxidants.** The effects of UV radiation are implicated in the production of *oxidants*, also called free radicals. These are unstable molecules produced by normal chemical processes in the body that, in excess, can damage the body's cells and even alter their genetic material, contributing to the aging process and sometimes to cancer. The large surface area of the skin makes this organ a prime target for oxidants.
- **Defective DNA Repair and Protective Enzymes.** Some melanomas and other skin cancers are caused by a breakdown in the mechanisms that help repair DNA damage. This can occur from various causes, including an inherited condition called xeroderma pigmentosum (XP). A number of enzymes in the skin help protect against this damage. One repair enzyme called T4 endonuclease 5 (T4N5) is, in fact, being investigated in lotions to protect against skin cancers.
- **Breakdown of Immune Protection.** Specific immune factors protect the skin, including white blood cells called T lymphocytes and specialized skin cells called Langerhans cells. Such immune factors attack developing cancer cells at the very earliest stages. Unfortunately, certain substances in the skin, of note a chemical called urocanic acid, suppress such immune factors when exposed to sunlight, setting the stage for skin cancers.
- **Defective Cell Death (Apoptosis).** Apoptosis is the last defense of the immune system. It is a natural process of cell-suicide, which occurs when cells are very severely damaged. Apoptosis in the skin kills off cells harmed by UVA so that they do not turn cancerous. (The peeling after sunburn is the result of these dead skin cells.) In some cases, however, genetic mutations or other factors derail apoptosis. If this occurs, the cells can become immortal and continue to proliferate, resulting in skin cancers.

Other Factors Involved in Skin Aging

In addition to sunlight, other factor may hasten the skin-aging process:

Cigarette Smoke. Smoking produces oxygen-free radicals, which are known to accelerate wrinkles and aging skin disorders and increase the risk for nonmelanoma skin cancers. Studies also suggest that smoking and subsequent oxidation produce higher levels of metalloproteinases, which are enzymes associated with wrinkles.

Air Pollution. Ozone, a common air pollutant, may be a particular problem for the skin. One study reported that it might deplete the amount of vitamin E in the skin; this vitamin is an important antioxidant.

WHO IS MOST LIKELY TO HAVE SKIN DISORDERS AS THEY AGE?

Age and Risk

Exposure to Sun in Childhood. It is estimated that 50% to 80% of skin damage occurs in childhood and adolescence from intermittent, intense sun exposure that causes severe sunburns. In spite of this now well known effect, many people still believe that a tan in children signifies health. And, even many parents who are concerned about sun exposure still rely too much on sunscreen and not enough on protective clothing.

The Elderly. Nearly half of people between the ages of 65 and 75 years old have at least one significant skin problem. And the majority of people over 75 have at least one skin disorder and many have three or four. Everyone experiences skin changes as they age, but a long life is not the sole determinant of aging skin. Family history, genetics, and behavioral choices all have a profound impact on the onset of aging-skin symptoms.

Activities Leading to Overexposure to Sunlight or Ultraviolet Radiation

Of all the risk factors for aging skin, exposure to UV radiation from sunlight is by far the most serious. Indeed, the vast majority of undesirable consequences of aging skin, including basal cell and squamous cell carcinomas, occur in individuals who are repetitively exposed to the sun. (Melanoma is more likely to be caused by intense exposure to sunlight in early life.)

People at risk include the following:

- People who are outdoors for long periods of time either for work or leisure.
- People who regularly attend tanning salons or use tanning beds. A 2002 study indicated that regular use significantly increases the risk for nonmelanoma skin cancers. Fair women under age 50 were at particular risk.
- People who are treated with PUVA for psoriasis or other skin problems. This procedure uses ultraviolet radiation. Unfortunately, researchers are finding that the increased cancer risks of PUVA may manifest 15 or more years after therapy. Psoriasis, in fact, may increase the risk for squamous cell carcinoma regardless of treatment. [For more information see the *Well-Connected Report #87 Psoriasis.*]

Skin Types and Ethnic Groups

People with light skin, blue, gray, or green eyes, red or blond hair, and lots of freckles are at highest risk than people with other skin types for developing skin cancers, including melanoma. The risk increases for those who are easily sunburned and rarely tan, particularly if they live close to the equator where sunlight is most intense. One study noted that Caucasians, particularly men, who have fewer dark pigment (*melanin*) cells as measured in the upper inner arm were more likely to develop melanoma and other skin cancers. Darker ethnic groups or those with swarthy complexions are not immune, however.

Experts have devised a classification system for skin phototypes (SPTs) based on the sensitivity to sunlight. It ranges from SPT I (lightest skin plus other factors) to IV (darkest skin). [See Table] People with skin types I and II are at highest risk for photoaging skin diseases, including cancer. It should be noted, however, that premature aging from sunlight can affect people of all skin shades.

Tanning and Sunburn History

Skin Type	Tanning and Burning History
I	Always burns, never tans, sensitive to sun exposure
II	Burns easily, tans minimally
III	Burns moderately, tans gradually to light brown
IV	Burns minimally, always tans well to moderately brown
V	Rarely burns, tans profusely to dark
VI	Never burns, deeply pigmented, least sensitive

Smokers

Cigarette smokers are more prone to skin cancers, including squamous cell carcinoma and giant basal cell carcinomas. And heavy smokers are almost five times as likely to have wrinkled facial skin than nonsmokers. [For more detailed information, see the *Well-Connected* report #41, *Smoking*.]

Radiation Therapy

Individuals who have received radiation therapy (such as radiation treatments for leukemia, goiters, ankylosing spondylitis) are at higher risk of developing basal cell carcinomas and squamous cell carcinomas.

WHAT ARE WAYS TO AVOID SUN EXPOSURE?

Staying out of the Sun

The best way to prevent skin damage in any case is to avoid episodes of excessive sun exposure. The following are some specific guidelines:

- Avoid exposure particularly during the hours of 10 AM to 4 PM when sunlight pours down 80% of its daily UV dose.
- Avoid reflective surfaces, such as water, sand, concrete, and white-painted areas. (Clouds and haze are *not* protective, and in some cases may intensify UVB rays.)
- Ultraviolet intensity depends on the *angle* of the sun, not heat or brightness. So the dangers are greater the closer to the summer-start date. For example, in the Northern Hemisphere, UV intensity in April (two months before summer starts) is equal to that in August (two months after summer begins).
- The higher the altitude the quicker one sunburns. (One study suggested, for example, that an average complexion burns at six minutes at 11,000 feet at noon compared to 25 minutes at sea level in a temperate climate.)
- Avoid sun lamps and tanning beds. They provide mostly UVA rays, and some experts believe that 15 to 30 minutes at a tanning salon are as dangerous as a day spent in the sun.

Sunscreens

The use of sunscreens is complex and everyone should understand how and when to use them. The bottom line is *not* that people should avoid sunscreens or sunblocks but that they should always use them in combination with other sun-protective measures. [See [Box Sunscreen Guidelines](#).]

SUNSCREEN GUIDELINES

Sunscreen Types

In choosing a sunscreen, look at the ingredients. Preparations that help block UV radiation are sometimes classified as sunscreens or sunblocks according to the substances they contain. In general, sunscreens have contained or organic formulas and sunblocks inorganic ingredients. However, the term sunblock is used less and less as sunscreens increasingly contain both kinds of ingredients:

- *Organic* formulas contain UV-filtering chemicals such as butyl methoxydibenzoyl-methane (also called avobenzone or Parsol 1789), benzophenones (dioxibenzone,

oxybenzone), sulisobenzone, methyl anthranilate, octocrylene, cinnamates (octyl methoxycinnamate, ethylhexyl p-methoxycinnamate), and terephthalylidene dicamphor sulfonic acid, a UVA blocker. Para-amino benzoic acid (PABA), once a popular ingredient, is now used infrequently. PABA may actually *break down* in the presence of UV exposure and release harmful oxidants. (And many people have an allergic reaction to it.) Not all these chemicals block UVA, and in choosing an organic sunscreen, people should look for a wide spectrum of chemicals.

- *Inorganic* formulas contain the UV-blocking pigments zinc oxide or titanium dioxide. Zinc and titanium oxides lie on top of the skin and are not absorbed. They prevent nearly all UVA and UVB rays from reaching the skin. Older sunblocks are white, pasty, and unattractive, but current products use so-called microfine oxides, either zinc (Z-Cote) or titanium. They are transparent and nearly as protective as the older types. Microfine zinc oxide may be more protective and less pasty-colored than microfine titanium oxide.

Inexpensive products work as well as expensive ones with the same ingredients. Unfortunately, there are still not standards for sunscreens, and even those claiming UVA protection may offer very little. In one study, the average UVA protection from a wide range of brands was only 23%. In fact, the average protection on brands not making the claim was 37%.

Note: Organic formulas and inorganic microfine oxides do not protect against *visible light*, which is a problem for people who have light-sensitive skin conditions, including actinic prurigo, porphyria, and chronic actinic dermatitis. Inorganic sunscreens that protect against visible light and are still cosmetically acceptable are now available in Europe, but not yet in the US.

Calculating the SPF

The sun protection factor (SPF) on all sunscreen labels is a ratio based on the amount of UVB (not UVA) radiation required to turn sunscreen- or sunblock-treated skin red compared to non-treated skin. For instance, people who sunburn in five minutes and who want to stay in the sun for 150 minutes might use an SPF 30. The formula would be: 30 (the SPF number) times five (minutes to burn) = 150 minutes in the sun.

Protection offered by sunscreens may be classified as follows:

- Minimal: SPF 2 to 11
- Moderate: SPF 12 through 29.
- High: 30+. (Although some sunscreens claim SPF's higher than 30, the added protection at such higher levels is insignificant.)

SPF Levels by Age Group

Certain groups should have higher or lower SPF's depending on age and other factors:

- Babies and young children should be well covered with clothing, sunglasses, and hats as the first line of defense against sunburn. Sunscreens should not be used on babies younger than six months without consulting a physician. Sunscreens should be used only if necessary in older children, since the long-term effects of the chemicals used in sunscreens are still unknown. For example, in two 2000 studies, one found greater numbers of moles and the other fewer numbers in children who used sunscreens. (Studies suggest that having numerous, normal moles may significantly increase the risk for melanoma.) Well-conducted studies on specific sunscreens are necessary to determine their safety in children.
- Older children and adults (even those with darker skin) benefit from using SPF's of 15 and over. Some experts recommend that most people should use SPF 30 on the face and 15 on the body.
- Adults who burn easily instead of tanning and anyone with risk factors for skin cancer should use at least SPF 30.

Timing and Amount of Application

Sunscreen or sunblock should be applied liberally as follows:

- Adults should include sunscreen with a daily skin regimen, even if going outdoors for only a short time.
- Apply initially 30 minutes before venturing outdoors for best results. (This allows time for the sunscreen to be absorbed. Then reapply every 15 to 30 minutes while in the sunlight.)
- Also reapply each time after exercise or swimming. (Choose a waterproof or water-resistant formula even if activities don't include swimming. Waterproof formulas last for about 40 minutes in the water, whereas water-resistant formulas last half as long.)
- Apply a large amount (equal to about one quarter of a four-ounce bottle) to all exposed areas, including ears and feet.
- Insect repellents reduce sunscreen SPF's by up to one-third. Use higher SPF's and very liberal application when applying both.

Possible Hazards of Sunscreens, Sun Avoidance, or Both

When used generously and appropriately, sunscreen products and sun avoidance help reduce the severity of many aging skin disorders, including squamous cell cancers. There are certain concerns, however.

Sunscreen Use May Not Protect against Basal Cell and Melanoma Cancers--and May Even Increase the Risk. Although sunscreens help prevent squamous cell carcinomas and other skin

disorders, sunscreens do not appear to provide protection against melanoma and some basal cell cancers. In fact, some studies have reported a *higher* association with sunscreen use and these skin malignancies, though not all studies report such negative results. The reasons for this possible increased risk are unclear, though some theories include the following:

- Until recently, many sunscreens blocked only or predominantly UVB rays and not UVA, the more deeply penetrating rays now known to be especially dangerous. (Most major sunscreen brands now block both UVA and UVB, but the effect of this double action on melanoma is not yet clear.)
- People who apply sunscreens may feel safe and stay out longer during high sun-exposure hours than is safe. It should be strongly noted that even if a person doesn't sunburn, UVA rays can still penetrate the skin and do harm.
- People do not put on enough sunscreen. In fact, according to one survey most apply about one quarter of the amount needed to meet standard recommendations for sun protection.
- Some sunscreen products, notably those containing PABA, may actually *break down* in the presence of UV exposure and release harmful free radical particles, which theoretically could increase the risk for cancer, though the long-term effects are not known. (Still other evidence suggests that some sunscreen ingredients protect against such oxidants.)

Sunscreens Use May Increase the Risk for Health Problems Related to Sunlight Deficiencies. There is some major concern that underexposure to sunlight, due to the use of sunscreens or sun-avoidance measures, may produce other health problems, such as the following:

- **Vitamin D Deficiency.** Vitamin D is found in foods, but it is primarily manufactured a chemical reaction to ultraviolet B sunlight. Vigorous sun-protection measures, then, may increase a person's risk for developing vitamin D deficiency. Vitamin D is important for prevention of rickets and osteoporosis and some cancers, *including melanoma*. People who need to avoid sunlight and whose diet is low in foods that contain vitamin D should take supplements. People with darker skin are at higher risk for deficiencies from sun protection than those with whiter skin. (Note: vitamin D is toxic in high doses.)
- **Other Cancers.** Although sunlight is implicated in skin cancers, it is also associated with lower risks for breast, prostate, ovarian, and colon cancers. Some protection against these cancers may be related to vitamin D production by sunlight.
- **Depression.** Many people suffer from SAD (seasonal affective disorder), a form of depression that generally occurs in winter and is associated with exposure to less sunlight.

The bottom line is that some sunlight is important and even necessary for a healthful and high-quality life. Some experts recommend that adults may benefit from daily moderate tanning (20 to 30 maximum minutes of exposure during lower-risk hours) over a number of

days to slowly build up pigment in the skin.

Protective Clothing

Wearing sun-protective clothing is extremely important and protects even better than sunscreens. Special clothing is now available for blocking UV rays and is rated using SPF ratings or a system called the UPF (ultraviolet protection factor) index, with 50 UPF being the highest. (According to one study, this is a very reliable indicator of protection.) The clothing is expensive, however. The following are some tips for anyone:

- Everyone, including children, should wear hats with wide brims. (Even wearing a hat, however, may not be fully protective against skin cancers on the head and neck.)
- People should look for loosely fitted, unbleached, tightly woven fabrics. The tighter the weave the more protective the garment.
- Washing clothes over and over improves UPF by drawing fabrics together during shrinkage. An easy way to assess protection is simply to hold the garment up to a window or lamp and see how much light comes through. The less the better.
- Everyone over age one should wear sunglasses that block all UVA and UVB ray.

Chemical Tanners

Some research suggests that melanin and dihydroxyacetone (DHA), the active ingredients in many self-tanning lotions, may help filter out UVA and UVB radiation and so be protective against sun damage. More research is underway.

WHAT DIETARY OR OTHER LIFESTYLE MEASURES MAY PREVENT AGING SKIN DISORDERS?

Needless to say, the best long-term prevention for overly wrinkled skin is a healthy lifestyle including the following:

Eat Healthily. A diet with plenty of whole grains, fresh fruits and vegetables, and the use of healthy oils (such as olive oil) may protect against oxidative stress in the skin. In fact, a 2001 study reported that people over 70 years old had fewer wrinkles if they ate such foods. Diet played a role in improving skin regardless of whether the people in the study smoked or lived in sunny countries. Benefits from these foods may be due to high levels of anti-oxidants found in them.

One study indicated that reducing intake of saturated (animal fats) might significantly reduce the risk of p actinic keratosis, a common aging skin disorder that can also be a precursor to skin cancer. It should be noted, however, that certain fatty acids, such as those found in

monounsaturated fats (e.g., olive and canola oils) or fish oils may help protect the skin against sun-related diseases.

Exercise. Daily exercise keeps blood flowing, which brings oxygen to the skin, an important ingredient for healthy skin.

Reduce Stress. Reducing stress and tension may have benefits on the skin.

Quit Smoking. Smoking not only increases wrinkles, but smokers have a risk for squamous cell cancers that is 50% higher than nonsmokers' risk. Smokers should quit to prevent many health problems, not just unhealthy skin. [For more detailed information, see the *Well-Connected* report, *Smoking*.]

Over-the-Counter Antioxidant Creams and Supplements

Antioxidants are substances that act as scavengers of oxygen-free radicals, the unstable particles that can damage cells and which are implicated in sun damage and even skin cancers. Antioxidants in the skin are depleted when exposed to sunlight and must be replaced. Antioxidant topical products (such ointments, creams, and lotions) may help protect against sun damage. Unlike sunscreens, they accumulate in the skin and are not washed away, so the protection may last. The antioxidants marketed for skin protection include vitamins A, C, E, selenium, coenzyme Q10 (CoQ10), and alpha-lipoic acid.

Oral Supplements. One small study found that taking a combination of oral vitamins C and E supplements may help reduce sunburn reactions, although the protection is much less than from sunscreens. (Taking the vitamins singly does not appear to have the same effect.)

Topical Antioxidants. Although there are wide claims about the benefits of antioxidants for wrinkles when used in skin creams, to date, only vitamins E and C and selenium applied topically have been proven to have any benefits for reducing sun damage in the skin. Even with these antioxidants, however, most available brands contain very low concentrations of them. In addition, they are also not well absorbed and they have a short-term effect. New delivery techniques, however, may prove to offset some of these problems.

- **Vitamin C, or ascorbic acid.** This is a very potent antioxidant and most studies on the effects of antioxidants on the skin have used this vitamin. In laboratory studies, large amounts reduced skin swelling and protected immune factors from sunlight. It may even promote collagen production. Vitamin C by itself is unstable, but products that solve the delivery problem are now available (e.g., Cellex-C, Avon's Anew Formula C Treatment Capsules, and others). One 2002 study using Cellex-C reported reduction in wrinkles around the mouth, on the cheek, and around the eyes. The product also appeared to improve skin thickness.
- **Vitamin E.** Studies suggest that topical vitamin E, particularly alpha tocopherol (a form of vitamin E) cream decreased skin roughness, length of facial lines, and wrinkle depth. Studies on mice have also reported reductions in UV-induced skin cancer with its use.
- **Selenium in the form of L-selenomethionine** has protected against sun damage and even delayed skin cancer in animal studies. It is not known if such benefits apply to people.

Other Natural Substances

The following natural substances have antioxidant properties and are being tried for wrinkle-protection.

- Both green and black tea and ginger appear to have properties that may provide some protection against skin cancers and photoaging. A 2001 study using extracts of topical green tea suggested that it might protect against ultraviolet damage. More research is warranted. Green tea skin care products are now available, but their quality is unregulated.
- The substance silymarin, found in the milk thistle family (which includes artichokes), may inhibit UVB-promoted cancers in animals.
- In one interesting study, eating garlic protected animals very effectively against UVB damage by interfering with urocanic acid in the skin. Whether these results may be applied to humans, and what quantities of garlic might be beneficial, is still unknown.

Warning Note: A wide range of herbal products, both oral and topical, may contribute to dermatological problems. Some Chinese herbal creams have been found to contain corticosteroids, and some may contain mercury or arsenic contaminants have been reported in some Ayurvedic therapies. In addition, a number of oral herbal remedies used for medical or emotional conditions may produce irritation in reaction to sunlight (photosensitivity). The include but are not limited to St. John's Wort, kava, and yohimbine. St. John's Wort, in fact, has been associated with severe toxicity in a patient who had laser treatments.

WHAT ARE SOME COMMON BENIGN AGING SKIN DISORDERS AND WHAT ARE TREATMENTS FOR THEM?

Wrinkles

In addition to avoiding the sun, hundreds of other methods and cosmetic products are available to retard the progress of wrinkles. Some may actually work to a degree. [For more detailed information, see the *Well-Connected* report, *Skin Wrinkles*.]

Severe Itching (Pruritis) and Preventing Dry Skin

About 30% to 40% of people over age 70 suffer from severe itching (*pruritus*), which can occur generally or in specific areas, such as bald spots in men.

Causes. Itching can be caused by various conditions, including but not limited to the following:

- Excessive dryness. Dry skin is the cause of most cases of itching in older people. In some cases, it can become severe enough to cause general inflammation and even fissures in the skin. It most commonly develops on the legs and in the winter.

- **Scabies.** These are tiny parasites typically located under the armpits, in the webs of fingers and toes, or around the ankles. It causes small red pimples, red patches, and scaling. In this case, the itch is usually worse at night.
- **Medications.** A number of drugs can cause itching and rash, particularly in response to sunlight. Stopping the drug resolves both the itch and rash. Common drugs that can cause this reaction include calcium channel blockers and thiazides (which are used for high blood pressure), common pain relievers known as NSAIDs (such as ibuprofen, naproxen, and aspirin) and antibiotics.
- **Eczema** [see below for description].
- **Symptoms of Serious Illness.** In rare cases, itching may be symptomatic of an underlying serious disease, so any persistent itching without an obvious cause should be reported to a physician. Such diseases include systemic lupus erythematosus (lupus), dermatomyositis, lymphomas, iron deficiency, liver and kidney disease, diabetes, and thyroid abnormalities.

Treating Dry Skin. The following measures may be helpful:

- **Moisturizing the skin** is the most important first step. Patients should avoid hot baths and most soaps. They should take short lukewarm showers and apply applying oils or moisturizing lotions while the skin is still damp. Moisturizers containing aluminum lactate (Amlactin, Lac-Hydrin) are best, although they can have some side effects, including stinging, and may interact with certain drugs.
- **Colloidal preparations** added to a lukewarm bath may be helpful. These are available in drugstores (e.g., Aveeno) or can be made at home by preparing a paste of two cups of Linit starch, cornstarch, or oatmeal plus four cups of water. The combination should be boiled then added to a tub half-filled with water. It is important to stress that these preparations may make the tub slippery.
- For specific itchy areas, over-the-counter lotions may be helpful that contain calamine, menthol, and phenol or combinations of all these ingredients (Sarna, Calamine Lotion, Schamberg's Lotion, Rhulicream). Cold compresses may provide temporary relief.
- **Over-the-counter antihistamines**, such as Benadryl, that are administered in the evening can help with generalized itching. (It should be noted that Benadryl will cause significant sedation if it is used during the day.)
- **Treatment from the physician** may include topical corticosteroids (commonly called steroids), anti-itching creams containing the ingredients doxepin or pramoxine, or mild tranquilizers. Note: some experts do not recommend steroid creams, since in some cases over-use of corticosteroids can cause itchiness, particularly in aged, sun-exposed skin. In some severe cases phototherapy with UVB radiation is helpful.

Liver Spots

Liver spots (medically referred to as lentigos or sun-induced or pigmented lesions) are flat brown spots on the skin. They are almost universal signs of aging. Occurring most noticeably on the hands and face, these blemishes tend to enlarge and darken over time. The extent and severity of the spots are determined by a combination of skin type, sun exposure, and age. These spots are harmless, but should be distinguished from lentigo maligna, which is an early sign of melanoma. [See *Melanoma* under *What Are Skin Cancers and Precancerous Lesions?*.]

Treating Liver Spots. They do not require treatment, although some people are distressed by their appearance. Treatments may include the following:

- Trichloroacetic acid (a chemical peel).
- Tretinoin (Retin A) alone or in a combination with Mequinol (Solag ). Tretinoin is a vitamin A derivative and is also effective in treating wrinkles. [For an in-depth description see *Well-Connected Report #21 Skin Wrinkles* .]
- Gentle freezing with liquid nitrogen (cryotherapy).
- Laser treatment. Specific lasers, such as the Nd:YAG, are effective in eliminating 80% of liver spots in one treatment. (It may be more effective than cryotherapy and have fewer adverse effects.)
- Bleaching creams. These are commonly available but are not as satisfactory as peels, and high concentrations can sometimes cause permanent loss of color.

Eczema in Older People

Eczema is an inflammatory response of the skin triggered by various factors, including stress. Although often associated with children, it is common in older people. All eczema is itchy and all produce areas of redness with pimples, blisters, scaling, or rough skin. Itching may be relieved using measures described above. Other specific treatments depend on the cause.

Eczema may have a rapid or slow course:

- Eczema can erupt suddenly as red raised blisters that can ooze and crust over.
- Eczemas can also become persistent, causing red, rough, scaly skin.

Both conditions can occur in the same person. There are many forms however, which are defined by their cause (if known) or their pattern of distribution. This report only deals with a few of the more common eczemas found in older people. [See Table [Some Forms of Eczema](#).]

Form of Eczema	Description	Prevention	Treatment
Irritant contact dermatitis	<p>Reaction to irritating or toxic substances (e.g., solvents, detergents) that have a toxic effect on the skin. Reaction can occur hours to months after exposure. Handwashing (so-called dishpan hands) most common cause. Symptoms are cracked, dry, and painful fingertips.</p>	<p>Determine irritant or toxin, if possible. Avoid irritants. For example, for dishpan hands an emulsion cleanser (Cetaphil or Aquanil) instead of hand soap. When using detergents or other irritants, wear rubber gloves lined with cotton.</p>	<p>Topical corticosteroids (commonly called steroids).</p>
Allergic contact dermatitis (Atopic dermatitis)	<p>Allergic response (delayed for at least 10 days) Allergens include certain plants (poison ivy, oak, and sumac, etc.), nickel, hair dyes, rubber, topical medications, insecticides, and cosmetics. Hands most often affected, but can be general or occur on the face.</p>	<p>Determine allergens and avoid if possible.</p>	<p>Topical corticosteroids (steroids) or, in severe cases, oral corticosteroids. Tacrolimus ointment (Protopic), an immunosuppressive drug, effective for moderate to severe allergic dermatitis.</p> <p>Investigative: Narrowband ultraviolet B (UVB) phototherapy plus topic steroids.</p> <p>One small study reported that 65% of people who did not respond to other treatments improved after drinking three cups of oolong tea a day for a month.</p>

<p>Photodermatitis, or actinic dermatitis</p>	<p>Triggered by exposure to sunlight after taking certain oral drugs (e.g., certain antibiotics, diuretics, antihistamines, and antidepressants) or topical chemicals (e.g., organic sunscreens). Reaction may be delayed with some oral medications. Eczema appears on light-exposed areas, such as the face, back of hands, forearms, and tips of the ears. In rare cases, can become chronic.</p>	<p>Avoid sunlight and change or stop medications.</p>	<p>Topical corticosteroids or, in severe cases, oral corticosteroids.</p>
<p>Stasis Dermatitis</p>	<p>Poor circulation. May produce swelling (edema), inflammation, ulcers, and itching skin usually in the lower leg.</p>		<p>Topical steroids for inflammation. Wet compresses and support stockings or elastic bandages to reduce swelling. Antibiotics may be used for infection. Note, however, allergic reaction to topical antibiotics for leg ulcers is common and some experts caution against them.</p>

Purpura

Purpura occurs when tiny capillaries rupture and leak blood into the skin. In older people, the

condition (called senile or actinic purpura) is usually caused by fragile blood vessels. The capillaries appear as flat purplish patches, which are called petechiae when they are smaller than 3 mm (about an inch) or ecchymoses when they are greater than 3 mm. Patients typically complain of a rash, which may appear reddish at first but gradually change color, turning brown or purple.

Treatment. Although there is no specific treatment for purpura, patients are advised to avoid trauma, including vigorous rubbing of the skin, which may be sufficient to damage the capillaries. Emollients that soften the skin may be helpful. Some physicians also recommend vitamin C, but its effectiveness is unproven.

Seborrheic Keratoses

Seborrheic keratoses are among the most common skin disorders in older adults. Their cause or causes are unknown. They usually appear on the head, neck, or trunk and can range in size from 0.2 cm to 3 cm (a little over an inch). They are well defined and appear to be pasted onto the skin, but their appearance can vary widely:

- They can be smooth with tiny, round, pearl-like formations embedded in them.
- They can be rough and warty.

Seborrheic keratoses sometimes look like melanoma, since they can have an irregular border, but they are always benign. A dermatologist can tell the difference between them, although experts warn that melanomas may "hide" among these benign lesions and go unnoticed without close inspection. In general, seborrheic keratoses have a uniform appearance while melanomas often have a smooth surface that varies in height, color density, and shading. In some cases keratoses may cause itching or irritation. They can be easily removed with surgery or freezing.

WHAT ARE SKIN CANCERS AND PRECANCEROUS LESIONS?

Skin cancer is now more common than all human cancers combined. In one study of people over 50 years, 65% had significant skin problems, including precancerous lesions and skin cancers. About 1.3 million people are expected to be diagnosed this year with either basal or squamous cell skin cancer. Melanoma, although less common than the other two major skin cancers, is the most dangerous.

Risk Factors for Skin Cancers

Sunlight and Ultraviolet Radiation. By far the most significant risk factor for all skin cancer is exposure to UV radiation.

Other Risk Factors. Other factors may increase the risk for specific skin cancers, including the following:

- A family history of skin cancer.

- Fair skin. While skin cancers affect all ethnic groups, they are most prevalent among those with lightly pigmented skin and become increasingly less common the darker the skin. Redheaded people have the highest risk followed by blondes. Skin cancers also tend to proliferate among older persons.
- Conditions that impair the immune system, such as HIV.
- Immunosuppressant drugs.
- High and regular exposure to certain toxic compounds such as creosote, radium, and arsenic.
- Psoriasis. Patients with psoriasis are at higher risk for skin cancers from phototherapy used to treat psoriasis. In addition, some evidence also suggests that the disease itself appears to be a risk factor for nonmelanoma skin cancers.

Self-Examination

Anyone with risk factors for skin cancers should be vigilant:

- Check the entire body every month or so.
- Use mirrors or have a partner examine the back, scalp, soles of the feet, and other hard-to-see spots. (Use a hair dryer to separate hair in order to examine the scalp.)
- Experts suggest drawing a map of the body indicating locations of moles, areas of discoloration, lumps, or other blemishes. Whenever a person conducts a self-examination, the map is checked for new lesions, lumps, or moles and for changes in shape, color, and size.
- If any suspicious areas are found, individuals should see a dermatologist or be sure their primary care physician is able to recognize skin cancers. (Primary care physicians may not always be as well trained as specialists in detecting skin cancers.)

Melanoma

Melanoma is the most serious of skin cancers. It is named for the skin cell from which it arises, the melanocyte, which produces pigment, or melanin. As people age, these pigment-forming cells often proliferate, forming harmless moles (called *nevi*).

Infrequently, however, the cells grow out of control and become *melanomas*, which are malignant and can be life threatening. Once relatively uncommon, malignant melanoma is increasing at an alarming rate, faster than any other cancer.

When melanoma is confined to the outer layer of skin, it is curable in 90% of cases. But if unchecked it can continue to spread to lymph and blood vessels, which increases the likelihood of its affecting distant sites in the body.

A mnemonic device, ABCD, is used to describe several features that help to distinguish melanomas from noncancerous growths:

- *Asymmetry (A)*. About half the time, a melanoma develops in an existing mole; in other cases, it arises as a new lesion that can resemble an ordinary mole. A non-cancerous mole, however, is generally symmetric and circular in shape, while melanoma usually grows in an irregular, asymmetric fashion.
- *Border Irregularity (B)*. Benign lesions generally have clearly defined borders that mark the boundary between mole and skin. A melanoma, in contrast, often has notched or indistinct borders that may signal ongoing growth and spread of the cancer.
- *Color Variation (C)*. One of the earliest signs of melanoma may be the appearance of various colors within the lesion. Because melanomas arise within pigment-forming cells, they are often varicolored lesions of tan, dark brown, or black, reflecting the production of melanin pigment at different depths within the skin. Occasionally, lesions are flesh colored or surrounded by redness or lighter areas of depigmentation. Pink or red areas may result from inflammation of blood vessels within the skin; blue areas reflect pigment in the deeper layers of the skin; and white areas can arise from dead cancerous tissue.
- *Diameter (D)*. A diameter of 6 millimeters or larger (about the size of a pencil eraser) is worrisome. Melanomas start out small; by the time a lesion has grown this large, other abnormalities will most likely be present. No matter what size, any suspicious lesion should be examined by a physician.

Individuals most at risk for melanoma tend to have a fair or freckled complexion, blond hair with blue, green or gray eyes, skin that burns easily, a history of sunburn, especially as a child or teenager, and a family history of melanoma.

Treatment consists of surgery, which can be curable if the cancer has not yet spread to the lymph nodes and to other sites in the body. Several new strategies for combating metastatic melanoma are being explored, including boosting the body's natural immune response to fight the disease. [For more complete information, see *Well -Connected Report #32, Melanoma.*]

Basal Cell Carcinomas

Basal cell carcinoma (BCC) is named for the round basal cells located in the lower part of the epidermis (the outermost layer of the skin), from which it arises. It is the most common skin cancer and, like melanoma, has been increasing at a dramatic rate.

Prevalence and Risk Factors. Basal cell carcinoma occurs in 800,000 people every year, and 30% of people, almost exclusively Caucasians, can expect to have basal cell carcinoma, on average by age 55. Some experts posit that genetic mutations caused by factors other than sunlight may also contribute to basal cell cancer.

Interestingly, a 2001 study reported that people with more wrinkles were less likely to develop

basal cell carcinomas, even among high-risk groups. Some experts suggest that people prone to wrinkles may respond to sun exposure with biologic mechanisms that protect against basal cell carcinoma. More research is needed confirm this.

Characteristics. The lesions usually develop later in life in areas that have received the most sun exposure, such as the head, neck and back, and especially the nose. About a third of basal cell carcinomas appear in areas not exposed to the sun.

Basal cell carcinomas (BCCs) are highly variable in appearance:

- They usually appear as a round area of thickened skin that does not change color or cause pain or itching.
- Very slowly, the lesion spreads out and develops a slightly raised edge, which may be translucent and smooth. Infrequently, basal cell carcinomas resemble malignant melanomas in color.
- Eventually, the center becomes hollowed and covered with a thin skin, which can become sore and open.
- A form known as aggressive-growth basal cell carcinoma resembles a scar with a hard base. This is type is more likely to spread and must be treated very aggressively.

They are sometimes hard to tell from a benign skin conditions. For instance, occasionally they arise in unexposed skin, where they may mimic an ordinary mole, cyst, or pimple. They may be particularly difficult to distinguish from benign cysts when they occur near the eyes.

Outlook. Usually, basal cells are slow growing and they are rarely fatal. Most basal cell carcinomas need not be treated as an emergency, although late treatment can cause disfigurement, so they should be removed as early as possible.

Basal cell carcinomas most likely to spread are larger one (more than 1 centimeter), scar-like BCCs, particularly those located on the cheek, and any BCC on the nose, neck, earlobe, eyelid, or temple.

Some studies are indicating that people with basal cell carcinoma may be at higher risk for second cancers, including melanoma, cancer of the lip, salivary glands, larynx, lung, breast, and kidney and non-Hodgkin's lymphoma. Those at higher risk for such cancers appear to be men and anyone diagnosed before 60 with BCC.

Squamous Cell Carcinoma and Bowen's Disease

Characteristics. Squamous cell carcinoma (SCC) develops from keratinocytes, flat, scale-like skin cells that lie under the top layer of the epidermis. The majority of squamous cell carcinomas occur on sun-exposed areas, especially the forehead, temple, ears, neck, and back of the hands. People who have spent considerable time sunbathing may develop them on their lower legs. Their appearance changes with its stage:

- Squamous cell carcinoma in situ (often referred to as *Bowen's disease*). This is the earliest

stage when the cancer is local and has not spread. Lesions are typically large reddish patches (often over one inch) that are scaly and crusted.

- Invasive squamous cell carcinoma. These are lesions that are highly likely to spread (metastasize). They enlarge either rapidly (over months) or slowly (over years). Eventually they become ulcerated.

Prevalence and Risk Factors. About 160,000 people develop squamous cell carcinomas every year. The incidence of this cancer is increasing.

Sun exposure and sun damage are the greatest risk factors, and the addition of other factors compound the risk:

- Older age.
- Being fair skinned, particularly having red hair.
- Living in sunny climates.
- Treatments for psoriasis, including PUVA (psoralen and UVA radiation) and immunosuppressant agents, such as cyclosporine, also pose a risk for squamous cell carcinoma (SCC).
- Genital warts (human papillomavirus) may also increase the risk in the genital and anal areas and around fingernails.

Outlook and Severity. Prompt treatment is desirable because squamous cell carcinomas are more likely to spread to local lymph nodes than are basal cell carcinomas, the other common skin cancer. Mortality rates for this cancer are very low, although squamous cell cancer still kills between 2,000 and 2,500 Americans each year. The risk for metastases (the spread of cancer to other organs) ranges from 0.5% to 16%, depending on risk factors. Squamous cell carcinomas most likely to spread include the following:

- Deep lesions, those larger than 2 cm in diameter, or patches with poorly defined margins.
- Recurrent lesions.
- SCC on neck, earlobe, eyelid, lips, or temple.
- SCC that develop in ulcers.
- SCC that develops on skin areas that have been previously treated with radiation or exposed to carcinogenic chemicals.

People with squamous cell carcinomas seem to be at higher risk for other cancers, including melanoma itself, lung cancer, non-Hodgkin lymphoma, bladder cancer, leukemia, and testicular and prostate cancer in men and breast cancer in women.

Precancerous Skin Disorders

Actinic (Solar) Keratoses. Actinic (also called solar) keratoses are the most common of all precancerous skin lesions. In fact, evidence now strongly supports the belief that actinic keratoses are actually squamous cell carcinomas in situ (the early stage of SCC). It should be noted, however, that not all actinic keratoses progress to carcinomas. One long-term study in 1999 indicated that the rate of malignant transformation might be about 10% over a 10-year period, while other studies show higher rates of progression to SCC.

Actinic keratoses occur after years of sun exposure and afflict over half of Caucasian persons aged 40 or older who live in hot sunny climates. They occur predominantly on sun-exposed skin such as the face, neck, back of the hands and forearms, upper chest, and upper back. Men may develop keratoses along the rim of the ear.

Actinic keratoses have the following characteristics:

- Lesions typically occur on the surface of the skin and have a sandpaper-like feel. In fact, they are sometimes more easily felt than seen.
- Most lesions are pink and even flesh-colored. Some are red or brown, scaly, and tender. At times, they can resemble melanomas and even dermatologists may have trouble telling the two apart.
- They can range in size from microscopic to several inches in diameter.

Keratoacanthomas. Keratoacanthomas closely resemble squamous cell carcinomas but they are not malignant. The majority arises in sun-exposed skin, usually on the hands or face. They are typically skin colored or slightly reddish when they first develop but their appearance typically changes:

- In the early stages, keratoacanthomas are smooth, red, and dome shaped.
- Within a few weeks, they can grow rapidly, usually to one or two centimeters. Some reach the size of a quarter in less than a month and can be rather disfiguring.
- They eventually stop growing and become crater-like with an outer rim of tissue surrounding and a sometimes crusty interior.

Most will spontaneously regress within a year but they almost always scar after healing. Also about 25% develop into squamous cell carcinomas, most frequently in older people and in sun-exposed areas. Removal by surgery (sometimes by radiation) is recommended. They may also be treated with 5-fluorouracil, either as a cream (Efudex) or with injections.

WHAT ARE THE TREATMENTS FOR NONMELANOMA SKIN CANCERS AND ACTINIC KERATOSES?

Although any diagnosis of cancer is frightening, very few people die of nonmelanoma skin cancers. They are generally slow growing and very curable. A number of options are available for treating these skin problems, including surgery, cryosurgery, phototherapy, radiation, and topical 5-fluorouracil. Few comparison studies have been performed to see which procedures are most effective for these skin problems .

Surgery

For any skin cancer and for some keratoses that require removal, surgery is the first treatment. It is usually one of the following:

Excisional Surgery. This is simply surgical removal of the cancerous lesion.

Curettage and Electrodesiccation. This procedure involves scraping away of the cancerous tissue followed by electric cauterization to stop the bleeding.

Mohs Micrographic Surgery. Mohs surgery offers the highest cure rate for squamous cell carcinomas. It is also used for aggressive basal cell carcinomas, larger basal cell carcinomas on the face, or those that occur in young people. This procedure involves the following:

- Very thin layers are removed one at time, with each layer examined immediately under a microscope.
- When the layers are shown to be cancer free, the surgery is complete.
- Because the physician needs to be certain that all cancer cells are removed, in some cases the surgical area required is very wide and requires plastic surgical techniques.

Mohs surgery saves more healthy tissue than other procedures and is highly effective. It results in a 99% cure rate for primary tumors and a 95% cure rate for recurrent ones.

Lasers. Laser surgery may be useful for certain basal cells and for keratoses that appear on the lips, although it is not clear whether lasers offer any advantages over other surgical treatments. Lasers do not appear to be very effective for thick or tough squamous cell carcinomas.

Cryosurgery

Cryosurgery removes skin cancer cells or actinic keratoses by freezing the affected tissue with liquid nitrogen (a technique known as cryosurgery). Studies report the following:

- It can remove even wide areas of actinic keratoses and may be more effective over the long term than treatment with 5-fluorouracil, the standard drug. Cryosurgery also appears to reduce the risk for squamous cell carcinoma in these patients.

- A head-to-head comparison or a freezing technique with Mohs micrographic surgery in patients with basal cell carcinomas (BCCs) reported similar recurrence rates with each approach. Over 85% of the patients with the freezing technique were satisfied with the appearance of the area afterwards. Five-year recurrence rates were only 2.1%. (Mohs surgery is still the treatment of choice for high-risk BCCs.)

Cryotherapy achieves good cosmetic results for many patients. However, it may cause blistering and ulceration, leading to pain and infection, as well as harmless, but undesirable, skin-color changes.

Radiation

In unusual cases where the carcinoma may be in an inoperable position (such as the eyelid or the tip of the nose) or if cancer has recurred multiple times, radiation therapy may be indicated. Radiation is directed at the tumor. It may take one to four weeks with treatments performed several times a week. One technique being investigated for basal and squamous cell carcinoma uses radiation implants (brachytherapy) and custom-made molds to specifically target the radiation. Studies suggest that this treatment is very effective with few complications.

Topical Phototherapy and Aminolevulinic Acid (ALA)

Topical phototherapy with aminolevulinic acid (ALA) is a nonsurgical method that is proving to be a good choice for treating actinic keratoses and nonmelanoma skin cancers. It employs blue light administered after that patient has taken aminolevulinic acid (Levulan Kerastik). ALA accumulates in the skin cells and when exposed to intense light, the chemical causes these cells to die. This approach allows precise targeting of one or more lesions, leaving healthy skin unaffected.

It does not penetrate deeper than the epidermis (the top layer of the skin), so it does not produce scarring or changes in skin color, as cryotherapy or other more invasive treatments do. It can cause irritation, including stinging, itching, and burning, but in one study only 3% of patients stopped using it for this reason.

ALA Phototherapy for Actinic Keratoses. ALA phototherapy is showing very good results for actinic keratoses. It works best on flat lesions performed in two treatments, and is more effective for clearing lesions on the face than those on the scalp. Phototherapy can also treat multiple lesions at the same time instead of sequentially, as in cryotherapy. Studies to date suggest that it may be superior to cryotherapy and equal to topical 5-fluorouracil in effectiveness and achieving a satisfactory appearance.

ALA Phototherapy for Nonmelanoma Skin Cancers. In patients with squamous cell carcinoma-in-situ and basal cell carcinoma, phototherapy has been equal to cryotherapy, with superior healing and appearance afterward. Nevertheless, two 2001 studies reported that despite initial good results, about 10% of patients using phototherapy experienced a recurrence within one year. These recurrence rates are higher than with surgery and other standard treatments. Longer-term studies are required before ALA phototherapy can be recommended for most patients with nonmelanoma skin cancers.

Exfoliation

Chemical peeling, or exfoliation, is useful for solar keratoses on the face, especially in people with fair, dry skin. Alpha-hydroxy acids, for example, are being investigated for keratoses.

Dermabrasion, which "sands" the skin, may also be effective although scarring is possible. A 2002 study found laser resurfacing to treat severe sun damage on the face, however, it may not prevent nonmelanoma skin cancers.

Medications

A number of medications are being used for keratoses and some may be helpful for skin cancers as well. Besides cryotherapy, 5-fluorouracil is the other most commonly used treatment for actinic keratoses. Other medications are also available. [See Table Medications for Keratoses and Common Skin Cancers.]

Medications for Keratoses and Common Skin Cancers
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Medication	Skin Conditions Affected	Oral or Topical.	Comments
5-Fluorouracil	Actinic keratoses, Small nonmelanoma skin cancers	Topical cream (Efudex, Fluoroplex) or injected gel containing 5-FU and epinephrine (AccuSite).	5-Fluorouracil (5-FU) removes actinic keratoses and is useful for some patients with a large number of lesions. It requires twice daily application for three to four weeks. Can cause significant redness, irritation, swelling, and crusting, which takes two to four weeks to heal. Newer preparations are reducing these side effects. It is still unclear if this medication protects against recurrent keratoses or future skin cancer. Of concern is the possibility that (5-FU) will clear the top of a skin cancer and obscure the rest of the cancer that lies beneath the surface of the skin.
Masoprocol (Actinex)	Actinic keratoses	Topical cream applied twice a day.	Have cancer-fighting properties. Side effects, including itching and redness, can be as severe as those from 5-fluorouracil.
Diclofenac and hyaluronan (Solaraze)	Actinic keratoses (approved). Investigated for basal cell.	Topical gel applied twice a day.	Diclofenac is a nonsteroidal anti-inflammatory drug (NSAID). When used to treat actinic keratoses, it is delivered to the skin with hyaluronan, a water-

			seeking molecule that helps maintain skin tension. Healing may not be evident until a month after treatment ends. It has modest effects and when healing occurs, it may not be evident for at least a month after treatment ends. However, it causes less irritation than 5-FU and may be useful for some people.
Imiquimod (Aldara)	Investigated for basal cell carcinoma, actinic keratoses	Imiquimod is a topical cream.	Imiquimod (Aldara) induces production of immune factors that help fight cell proliferation. It has good cosmetic results and is showing promise for actinic keratoses and also for basal cell carcinoma.
Alpha-Interferons	basal cell carcinoma, squamous cell carcinoma	Require injections administered three times a week.	Interferons are immune factors that are being used to treat a number of serious conditions. Alpha-interferon injections may be effective against skin cancers that are hard to treat using conventional surgical measures.

WHERE ELSE CAN HELP FOR DISORDERS RELATING TO AGING SKIN BE FOUND?

The Skin Cancer Foundation, 245 Fifth Ave., Suite 1403, New York, NY 10016. Call (800-SKIN-490) or on the Internet (<http://www.skincancer.org>)

Provides good information; their Internet Site also has good information, good links, and its site provides the UV Index. Pictures at:

basal cell carcinoma (<http://www.skincancer.org/basal/index.html>)

squamous cell carcinomas (<http://www.skincancer.org/squamous/index.html>)

melanomas (<http://www.skincancer.org/melanoma/index.html>)

American Academy of Dermatology and American Society for Dermatologic Surgery, 930 E. Woodfield Rd., Schaumburg, IL 60168-4014. Call (847-330-0050) or to locate a dermatologist (888-462-3376) or (<http://www.aad.org/>) and (<http://www.asds-net.org>)

The American Academy of Dermatology sponsors free annual screening exams.

The Environmental Protection Agency provides information on the UV Index. Call (202-564-9361) or (<http://www.epa.gov/sunwise/overview.html>)

The UV index ranges from 1 to 10+; the higher the index number the greater the exposure to UV rays. This index is valid for about a 30-mile radius around the city from which the broadcast originates. Currently, the computation of the UV Index does not include the effects of variable surface reflection (e.g., sand, water, or snow), atmospheric pollutants, or haze.

American Cancer Society, 1599 Clifton Road, NE, Atlanta, GA 30329. Call (404-320-3333) or (800-ACS-2345) or on the Internet (<http://www.cancer.org>)

Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Mail Stop K64, 4770 Buford Highway, NE, Atlanta, GA 30341-3717. Call (1-888-842-6355) or (<http://www.cdc.gov/nccdphp/dcpc/nscpep/skin.htm>)

National Council on Skin Cancer Prevention (<http://www.skincancerprevention.org>)

The following are two companies that offer sun-protective clothing. These companies have not been reviewed by our editors. Other companies are also available.

Sun Precautions, Inc., 2815 Wetmore Avenue, Everett, Washington 98201. For a catalog call (800-882-7860) or on the Internet (<http://www.solumbra.com/>)

Sun Protective Clothing, 598 Norris Court, Kingston, Ontario K7P 2R9. . Call (613-384-3230) or (800-353-8778) or on the Internet (<http://www.sunprotectiveclothing.com>)

Good Internet Sites with Illustrations

Sponsored site affiliated with American Academy of Dermatology (<http://www.skincarephysicians.com/agingskinnet/index.html>) or (<http://www.skincarephysicians.com/actinickeratosesnet/index.html>)

University of Pennsylvania sponsors an excellent cancer site at (<http://www.oncolink.com>)

Excellent article on basal cell carcinoma with pictures

<http://www.emedicine.com/derm/topic47.htm>)

Article on squamous cell carcinomas

<http://medschool.ucsd.edu/derm1/SCC/2dermweb1.html#contents>)

RECENT LITERATURE.

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