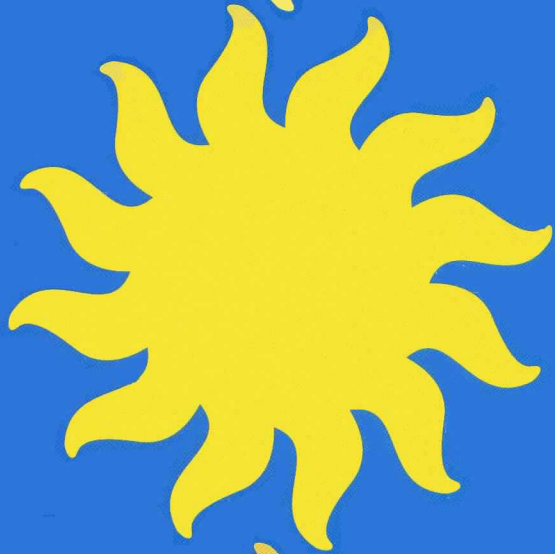
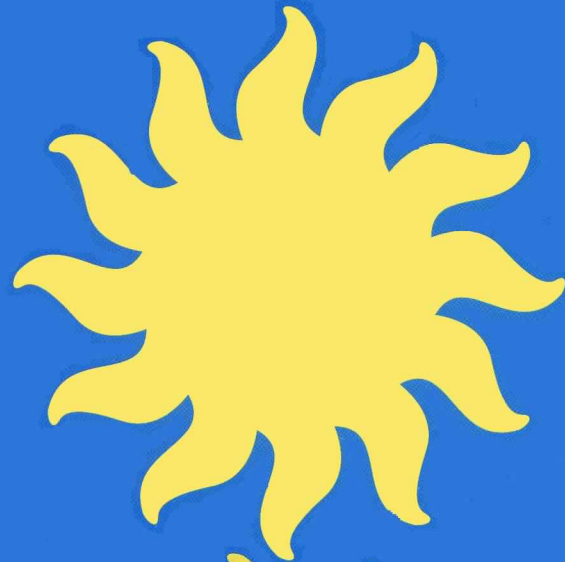


# Skin Cancer Prevention:

## A Role for Pharmacists





The California Employee Pharmacist Association (CEPA) is approved by the American Council on Pharmaceutical Education (ACPE) as a provider of continuing pharmaceutical education.

Universal Program No. 125-000-96-013-H04

This program is approved for 0.1 CEU (1 contact hour) in all states recognizing ACPE-approved providers. Certification will be issued upon successful completion of the posttest (70% or better).

**CEPA**

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# **Skin Cancer Prevention: A Role for Pharmacists**

**Supplemental Monograph**





## Skin Cancer Prevention: A Role for Pharmacists

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## INTRODUCTION

In recent years, the health care community has been quite successful in educating the public about the link between skin cancer and sun exposure. Nevertheless, skin cancer remains a significant public health risk. The pharmacist can play an important role in reducing this risk by educating patients on how to protect the skin from the harmful effects of the sun.

Providing patients with sun protection products and information on sun safety also makes good business sense. Although sun worshipping has lost some of its appeal, many people continue to enjoy spending time in the sun. For this reason, manufacturers have widened the range of sunscreens and sunblock products that are commercially available.

More importantly, counseling patients about safe sun exposure enhances pharmacists' professional satisfaction. In order to provide effective patient education, pharmacists need to keep abreast of new product developments and to understand the detrimental effects of sun exposure.

In order to maximize your effectiveness as a skin cancer prevention educator, you will need to:

- ✱ know the facts about skin cancer and its prevention, and
- ✱ be able to recognize opportunities for educating your patients.

The monograph and videotape cover both areas.



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## GOALS

The goals of this pharmacist continuing education activity, which consists of a videotape and accompanying monograph, are to:

- ✱ Describe the relationship between sun exposure and skin cancer;
- ✱ Present information about various types of sunscreens; and
- ✱ Review guidelines for educating patients about how to protect their skin from photodamage.

## OBJECTIVES

After successfully completing this continuing education activity, including the posttest and program evaluation, the pharmacist should be able to:

- ✱ Describe guidelines for protecting the skin from photodamage, including recommendations for children;
- ✱ Recognize the six standard skin types and their characteristics;
- ✱ Identify the three categories of sunscreens available in the United States;
- ✱ List important considerations in selecting a sunscreen;
- ✱ Enumerate the warning signs of skin cancer; and
- ✱ Counsel patients about how to avoid sun-associated skin damage.



## **EPIDEMIOLOGY OF SKIN CANCER**

Skin cancer is approaching epidemic proportions in this country. The incidence has been climbing at the alarming rate of 4% per year. According to the American Cancer Society, the lifetime risk for white Americans of developing a malignant melanoma will be 1 in 75 by the year 2000.

Traditionally, skin cancer has been thought of as a disease that primarily affects elderly patients, but this is no longer accurate. Much of the increased incidence of skin cancer can be attributed to new cases in younger patients, including those in their 20s and 30s. Approximately one quarter of the cases of malignant melanoma, which is the most fatal form of skin cancer, is seen in patients under the age of 25.

The three most common skin cancers are:

- basal cell carcinoma
- squamous cell carcinoma
- malignant melanoma.

Fortunately, the vast majority of skin cancers are easily treatable; both basal cell and squamous cell carcinomas have over 90% cure rates with early diagnosis, and rarely metastasize. Malignant melanoma, however, can metastasize unless it is treated with adequate surgery in its early stages. Once the invasion in the skin is deep, malignant melanoma can be fatal; however, caught early, malignant melanoma is readily curable.

## **CORRELATION WITH OZONE DEPLETION**

A number of factors may account for the exponential increase in skin cancers. Migration to the Sunbelt, lifestyle changes resulting in more outdoor activities, and better detection all appear to play a role. There is also a great deal of concern about how thinning of stratospheric ozone, which screens out much of the sun's ultraviolet (UV) radiation, will affect the incidence of skin cancer.

In the spring of 1991, the United States Environmental Protection Agency reported that rapid deterioration of the ozone layer was linked to an acceleration in the annual incidence of skin cancer. According to some calculations, there is a 4% rise in the incidence of skin cancer for every 1% decrease in the ozone layer. Although there is continuing debate about the precise degree and rate of ozone depletion, it can be assumed that if present trends continue, we will see hundreds of thousands of new cases of skin cancer by the year 2000.





## REDUCING PHOTODAMAGE RISK FACTORS

Important risk factors for nonmelanoma skin cancer include:

- skin type
- cumulative sun exposure (especially in childhood)
- living in more southerly latitudes
- family history.

There are seven risk factors for malignant melanoma defined by New York University and others:

- Blonde hair
- Three or more blistering sunburns in youth
- Three or more summers working out of doors in youth
- Many freckles on the back
- Actinic keratosis on the face
- A family history of malignant melanoma
- The presence of more than 50 moles.

There is particular concern for families with a history of dysplastic nevus syndrome; family members of these patients have a near 100% risk of developing melanoma or other skin cancers.

Skin type and family history are not modifiable risk factors. However, patients can take steps to protect their skin from excessive sun exposure. In 1988, the American Academy of Dermatology Consensus Conference on Photoaging and Photodamage issued guidelines for minimizing the harmful effects of the sun. Those guidelines recommend that everyone should:

- wear wide-brimmed hats
- cover up exposed skin as much as possible
- use sunscreens with a skin protection factor (SPF) of at least 15 whenever outdoors, year-round.

Sun protection is especially important in certain subgroups of patients. These include fair-skinned people living in sunny southern latitudes where they may spend more time outdoors, and where sun exposure is more intense than in northern latitudes. Also, patients who smoke may be at particular risk, according to a 1992 report from the Skin Cancer Prevention Study Group (*JAMA*. June 1992;267:3305). Karagas and associates found that there was a twofold increased risk of squamous cell carcinoma in male patients who smoked cigarettes compared with nonsmoking men.



## **SKIN TYPES AND MINIMUM ERYTHEMA DOSE (MED) CALCULATION**

Skin types are categorized according to how long it takes an individual to reach his or her minimum erythema dose (MED)—that is, the smallest amount of sunlight exposure necessary to induce a slight redness of the skin within 24 hours after exposure. The American Academy of Dermatology recognizes six skin types, categorized according to the amount of melanin normally present in the skin (see Table 1). It should be noted, however, that noontime summer sun exposure is not recommended for anyone, regardless of their skin type.

MED calculations are typically given for a latitude of 40 to 45 degrees. A patient's MED may be reached twice as quickly when close to the equator—for example, a very fair Type 1 patient wearing no sunscreen would reach his or her MED within about 10 minutes in Panama City or Singapore. A sunscreen with an SPF of 15 would provide the patient with only 2 ½ hours of protection, compared with the 5 hours that would be expected in much of the United States.

Altitude and reflection also make a difference. For every 1,000-foot increase in altitude, the intensity of UV radiation increases about 4%. Thus, the intensity of UV light at 5,000 feet is about 20% greater than at sea level. A patient who is skiing at a high altitude also is exposed to light reflected off the snow.

In addition, patients should account for reflection off sand, water, and concrete. Sand reflects about 17% of the sun's UV rays, while snow reflects 80%. Some of the most vulnerable parts of the body include areas where the sun does not usually strike, for example, under the arms. People who sail are at particular risk; not only are they directly exposed to UV radiation, but also they get double reflection off the water and off the white decks of the boat.

Finally, the time of day and time of year influence the intensity of UV radiation. The sun is strongest between the hours of 10:00 a.m. and 3:00 p.m., and it is significantly more intense in the summer than in the winter.

**Table 1: Minimum Erythema Dose (MED)\* Classifications**

| <b>Skin Type</b> | <b>Physical Characteristics</b>                              | <b>Minutes to MED*</b> |
|------------------|--|------------------------|
| Type 1           | Very fair complexion, burns easily and severely, never tans. | 20                     |
| Type 2           | Fair complexion, burns easily, may tan minimally.            | 25 - 30                |
| Type 3           | Light complexion, burns moderately, tans an average amount.  | 35 - 40                |
| Type 4           | Medium complexion, burns minimally, tans easily.             | 40 - 50                |
| Type 5           | Dark complexion, rarely burns, tans easily and darkly.       | 50 - 60                |
| Type 6           | Dark or black skin, burns only with severe exposure.         | 60 - 75                |

\*MED = Calculated as time of exposure necessary to induce slight redness of the skin within 24 hours of sunlight exposure at noon in midsummer at a latitude of 40 to 45 degrees—e.g., northern California, Kansas City, or New York City.

NOTE: Noontime summer sun exposure is not recommended for anyone, regardless of their skin type.



## CONSIDERATIONS IN SUNSCREEN SELECTION

A host of sunscreens are currently available, and manufacturers are constantly introducing new products to the market. With such a wide variety of products, making a wide variety of claims, it can be confusing for patients to select among them. The essential points the patient should consider are:

- ✱ *First*, what is the product's SPF?
- ✱ *Second*, does it offer both UVA and UVB protection?
- ✱ *Third*, what are its cosmetic properties?

The SPF number on sunscreens enables patients to calculate how much longer they might stay out in the sun before reaching their MED than if they were unprotected. For example, a patient with Type 1 skin (MED of 20 minutes) could theoretically stay out in the sun for 5 hours without any evidence of burning after applying a product with an SPF of 15.

## UVA VERSUS UVB COVERAGE

Sunscreens fall into three principal categories: chemical UVA absorbers, chemical UVB absorbers, and physical or mechanical blockers such as zinc oxide, titanium dioxide, and red petrolatum. Almost all available sunscreens block or absorb UVB radiation—that is, the shorter, higher-energy UV light that causes burns and is strongly associated with the development of skin cancer.

Recently, a concern has arisen about the additional effects of UVA. These longer, lower energy wavelengths cause slower and more subtle skin damage than UVB. In addition to causing photodamage to the skin, these agents also may promote carcinogenesis due to UVB.

Many sunscreens combine several ingredients, allowing them to provide at least some degree of protection against both UVA and UVB radiation. For example, padimate O blocks UVB quite effectively, although its protection extends only a short way into the UVA spectrum. Benzophenone-3 is somewhat less effective in blocking UVB, but it offers more UVA protection. The mechanical sunblocks, such as zinc oxide and titanium dioxide, also offer partial UVA protection in addition to blocking UVB rays.

Only one sunscreen chemical, trademarked as Parsol<sup>®</sup> 1789, provides substantial protection against the full UVA spectrum. Currently, there is one product on the market that contains this ingredient: Shade<sup>®</sup> UVAGUARD<sup>™</sup>, from Schering-Plough. The product contains Parsol combined with oxybenzone, and thus legitimately can claim substantial protection in both the UVA and UVB ranges.

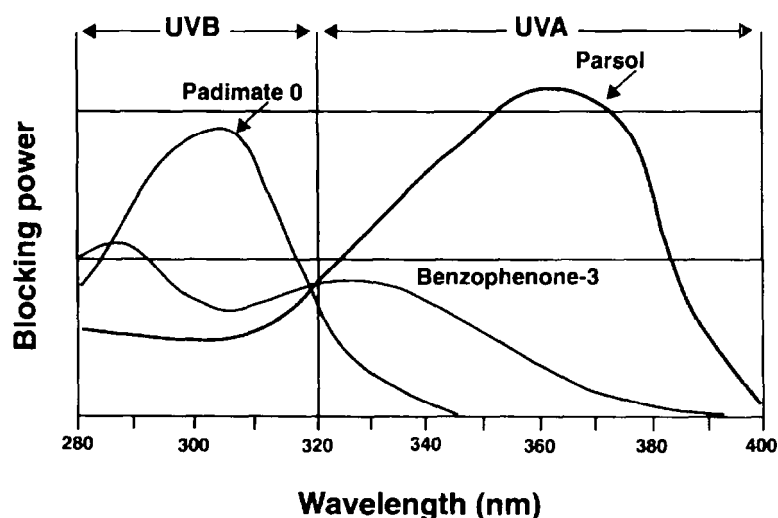


## INFORMATION ON SUNSCREENS FROM THE FOOD AND DRUG ADMINISTRATION (FDA)

The FDA's updated recommendations for sunscreen use were published in May 1993. When these recommendations are finalized, sunscreen manufacturers will be required to abide by them. The following points are especially relevant:

- ✱ SPF ratings over 30 do not add sunscreen protective value. The term “sunblock” may be used only for products that reflect or scatter all light in the UV and visible range; currently, this refers only to products containing titanium dioxide.
- ✱ Sunscreen products should be labeled as follows: “Sun Alert: The sun causes skin damage. Regular use of sunscreens over the years may reduce the chance of skin aging, some types of skin cancer, and other harmful effects due to the sun.”
- ✱ Because Caucasian skin absorbs 40% to 50% of UVA radiation, protection against UVA may be as important as protection against UVB. However, the FDA did not propose labeling for UVA protection in sunscreens due to lack of adequate data.

The American Academy of Dermatology takes the position that all patients should use a sunscreen with an SPF of at least 15—regardless of the skin type. Patients tend to overestimate their MED and pick products with inappropriately low SPFs, and apply the product more sparingly than intended by the manufacturer.



**Fig. 1.**—Sunscreen chemicals provide varying degrees of protection against UVA and UVB radiation. Parsol<sup>®</sup> is the only agent currently available that provides substantial protection in the UVA range. Adapted from Lowe N, Shaath N, eds. *SUNSCREENS*. New York, NY: Marcel Dekker; 1990;34:537-539.



## PHOTOSENSITIZING AGENTS

Patients using photosensitizing agents must be especially diligent about routine application of a high-SPF sunscreen. Some common photosensitizing medications include antibiotics such as tetracycline, oral contraceptives, oral hypoglycemic agents, some antihistamines, and certain antihypertensive agents, including diuretics. Skin creams containing tretinoin are also highly photosensitizing—patients who use Retin-A<sup>®</sup> (tretinoin/Ortho) should also use a broad-spectrum UVA/UVB sunscreen every day. Over-the-counter skin products and common cosmetics can also trigger a severe, rapid sunburn in some patients. Most of the photosensitizing agents have an absorption spectrum in the UVA range, and therefore, a sunscreen with UVA protection capability should be recommended. Please see Table 2 for a list of photosensitizing agents.

## SKIN REACTIONS TO SUNSCREENS

A variety of different chemical agents are used to make sunscreens, and some patients may be allergic or have a skin sensitivity to some of these agents. For example, many people are sensitive to *para*-aminobenzoic acid, or PABA, which is no longer used in commercial sunscreens. There had initially been some concern that allergic and irritant reactions would be seen more frequently in products with high SPF numbers, which contain higher concentrations of these chemicals. There is no evidence, however, of a correlation between allergenicity and a given product's SPF number.

**Table 2: Medications That May Cause Photosensitivity**

**ANTICANCER**

dacarbazine (*DTIC-Dome*®)  
fluorouracil (*Fluoroplex*®)  
flutamide (*Eulexin*®)  
methotrexate (*Folex*®)  
vinblastine (*Velban*®)

**ANTIDEPRESSANTS**

amitriptyline (*Elavil*®)  
amoxapine (*Asendin*®)  
clomipramine (*Anafranil*®)  
desipramine (*Norapramine*®)  
doxepin (*Adapin*®)  
imipramine (*Tofranil*®)  
isocarboxazid (*Marplan*®)  
maprotiline (*Ludiomil*®)  
nortriptyline (*Aventyl*®)  
phenelzine (*Nardil*®)  
protriptyline (*Vivactil*®)  
sertraline (*Zoloft*®)  
trazodone (*Desyrel*®)  
trimipramine (*Surmontil*®)

**ANTI-HISTAMINES**

astemizole (*Hismanal*®)  
cyproheptadine (*Periactin*®)  
diphenhydramine (*Benadryl*®)  
terfenadine (*Seldane*®)

**ANTI-HYPERTENSIVES**

captopril (*Capoten*®)  
diltiazem (*Cardizem*®)  
methyldopa (*Aldomet*®)  
minoxidil (*Loniten*®)  
nifedipine (*Procardia*®)

**ANTIMICROBIALS**

azithromycin (*Zithromax*®)  
ciprofloxacin (*Cipro*®)  
clofazimine (*Lamprone*®)  
dapson  
griseofulvin (*Fulvicin-U/F*®)  
\*lomefloxacin (*Maxaquin*®)  
\*nalidixic acid (*NegGram*®)  
norfloxacin (*Noroxin*®)  
ofloxacin (*Floxin*®)  
doxycycline (*Vibramycin*®)  
pyrazinamide  
\*sulfanomides  
\*tetracycline (*Achromycin*®)  
minocycline (*Minocin*®)  
trimethoprim (*Proloprim*®)

**ANTI-PARASITIC DRUGS**

\*bithionol (*Bitin*®)  
chloroquine (*Aralen*®)  
mefloquine (*Lariam*®)  
pyrvinium pamoate (*Povan*®,  
*Vanquin*®)  
quinine  
thiabendazole (*Mintezol*®)

**ANTI-PSYCHOTIC DRUGS**

\*chlorpromazine (*Thorazine*®)  
chlorprothixene (*Taractan*®,  
*Tarasan*®)  
fluphenazine (*Permitil*®)  
haloperidol (*Haldol*®)  
perphenazine (*Trilafon*®)  
\*prochlorperazine (*Compazine*®)  
thioridazine (*Mellaril*®)  
thiothixene (*Navane*®)  
trifluoperazine (*Stelazine*®)  
triflupromazine (*Vesprin*®)

**DIURETICS**

acetazolamide (*Diamox*®)  
amiloride (*Midamor*®)  
furosemide (*Lasix*®)  
methyclothiazide (*Aquatensen*®)  
\*thiazides (*Diuril*®, *HydroDIURIL*®,  
*Naturetin*®, etc.)  
triamterene (*Dyrenium*®)

**HYPOGLYCEMICS**

acetohepamide (*Dymelor*®)  
chlorpropamide (*Diabinese*®)  
glipizide (*Glucotrol*®)  
glyburide (*DiaBeta*®, *Micronase*®)  
tolazamide (*Tolinase*®)  
\*tolbutamide (*Orinase*®)

**NSAIDS**

diflunisal (*Dolobid*®)  
ibuprofen (*Motrin*®)  
indomethacin (*Indocin*®)  
ketoprofen (*Orudis*®)  
nabumetone (*Relafen*®)  
naproxen (*Naprosyn*®)  
phenylbutazone (*Butazolidin*®)  
\*piroxicam (*Feldene*®)

\*Reactions occur more frequently.  
Brand names are included for  
example only and do not imply  
endorsement.

**SUNSCREENS**

aminobenzoic acid (*PABA*)  
avobenzone  
\*benzophenones  
cinnamates  
homosalate  
menthyl anthranilate  
\*PABA esters

**OTHERS**

alprazolam (*Xanax*®)  
amantadine (*Symmetrel*®)  
\*amiodarone (*Cordarone*®)  
benzocaine  
benzoyl peroxide  
\*bergamot oil, oils of citron, lavender,  
lime, sandalwood, cedar, citrus rind  
carbamazepine (*Tegretol*®)  
chlorthalidoxepoxide (*Librium*®)  
clofibrate (*Atromid-S*®)  
contraceptives, oral  
desoximetasone (*Topicort*®)  
disopyramide (*Norpace*®)  
etretinate (*Tegison*®)  
fluorescein (*Fluorescein*®)  
gold salts (*Myochrysine*®)  
hexachlorophene (*pHisoHex*®)  
\*isotretinoin (*Accutane*®)  
\*6-methylcoumarin (used in perfumes,  
shaving lotions and sunscreens)  
\*musk ambrette (used in perfumes)  
\*promethazine (*Phenergan*®)  
quinidine sulfate and gluconate  
\*tretinoin (*Retin-A*®)  
trimeprazine (*Temaril*®)



**Remember:**

Recommend sunscreen and other  
sun protective measures when  
prescribing medications that may  
cause photosensitivity.



## COSMETIC PROPERTIES

Sunscreens are available in myriad formulations, including creams, lotions, gels, sticks, and sprays. In addition, they may be scented or unscented. Patients should be encouraged to use whichever products they find cosmetically acceptable that also offer adequate SPF coverage. The cosmetic properties of a sunscreen are important, because patients will not use a product that feels uncomfortable, smells unpleasant, or is otherwise unacceptable.

Men tend to be much more resistant to using sunscreens than women. Part of the reason may be a perception that it is somehow “unmanly” to admit to being sensitive to sun exposure. In addition, men commonly complain that sunscreens have a feminine fragrance or are too greasy. Men can be reassured that there are now many different unscented products, including greaseless, alcohol-based lotions and gels that can be applied smoothly even to hair-bearing areas of the skin. Women, however, may prefer sunscreens with a moisturizing base, especially when the product is being applied to the face.

Patients who engage in active outdoor sports are bothered by sunscreens that sting their eyes when they sweat. Some products cause less stinging than others. Also, stick and gel formulations are not as likely to run into the eyes when the patient sweats. Applying a sunscreen to the face 20 to 30 minutes prior to exposure and exertion also may reduce the chances that perspiration will cause the sunscreen to run down into the patient’s eyes.

## WATER RESISTANCE

Water resistance is an important concern for people who swim or are involved in active outdoor sports that produce perspiration. Many sunscreens are hydrophobic, and some are even promoted to stay on for up to 7 or 8 hours of submersion in salt water. Nevertheless, patients should be advised to reapply waterproof and water-resistant products after swimming or sweating, just to be safe. Patients should understand that reapplying a sunscreen does not extend the period of protection—it only renews the protection that existed when the product was first applied. The FDA has established the following criteria:

- ✱ *Sweat resistant*: The product must protect for up to 30 minutes of continuous heavy perspiration.
- ✱ *Water resistant*: The product must protect for up to 40 minutes of continuous water exposure.
- ✱ *Waterproof*: The product must protect for up to 80 minutes of continuous water exposure.





## PATIENT EDUCATION

The pharmacist should educate patients, especially high-risk patients, about the prevention of skin cancer. All patients-whatever their risk group-should be taught the danger signs of skin cancer:

- Changes in the color, size, or surface texture of moles or birthmarks;
- New skin growths, especially if they crust, bleed, itch, or hurt;
- Sores or wounds that do not heal within a month.

The essential message for all patients is simple and straightforward: there is no safe way to get a tan from the sun. Patients must understand that a sunburn or tan is simply a visible indication of underlying-and possibly irreparable—skin injury. The long-term consequences of sun damage, including photoaging and injury to cellular DNA, can occur even when the patient does not actually burn.

Patients who are determined to look tanned may want to try one of the “sunless” tanning products. These products, which contain the colorant dihydroxyacetone, stain the stratum corneum. Sunless tanners appear to be safe, and they produce a cosmetically acceptable result when applied properly. Patients should be reminded, however, that these products do not provide any additional protection against the damaging effects of the sun.



## **SUN DAMAGE AND SUNSCREENS: PATIENT COUNSELING TIPS**

- ✱ UVA radiation causes skin aging; UVB causes burning. Products that contain both cinnamates and benzophenone derivatives or Parsol<sup>®</sup> 1789 screen both UVA and UVB light.
- ✱ Tanning salons often advertise that they provide a “safe” way to tan because superficial skin burning is minimized with the use of UVA light, which penetrates more deeply into the skin. However, concerns regarding skin aging and carcinogenesis are just as relevant as with ordinary sunlight exposure.
- ✱ Many factors influence how quickly a burn (or tan) develops, including skin type, time of day, cloud cover, and latitude, as well as reflection off sand, water, snow, concrete, or other surfaces.
- ✱ Apply sunscreens 30 to 60 minutes before sun exposure, and reapply frequently to maintain coverage. NOTE: reapplying the product does not extend the duration of protection beyond the original SPF rating.
- ✱ Make sure that all exposed skin is generously covered with sunscreen.
- ✱ Choose a higher SPF and increase the amount and frequency of sunscreen application in areas of strong sunlight.

## The ABCDs of Malignant Melanoma

**Asymmetry, Border Uneven, Color Variable,  
Diameter Greater Than 6 mm**



**Fig. 2.**—Normal nevi (moles) are symmetrical with even edges, uniform color, and size smaller than 6 mm.



**Fig. 3.**—Malignant melanoma illustrating asymmetrical shape.



**Fig. 4.**—Malignant melanoma illustrating uneven borders with scalloped appearance.



**Fig. 5.**—Malignant melanoma illustrating variegated color and larger diameter.

## Actinic Keratosis

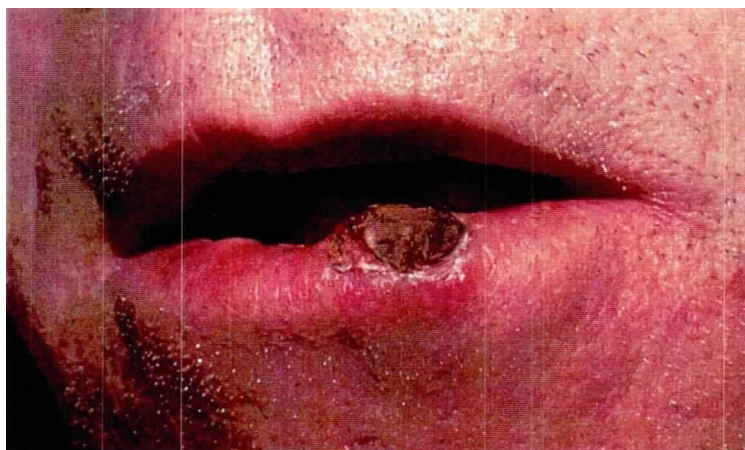


**Fig. 6.**—Actinic keratosis is the most common precancerous dermatosis. Lesions of various sizes develop on areas exposed to the sun and may develop into squamous cell carcinomas.

## **Squamous Cell Carcinomas: Most Common in Sun-Exposed Areas**



**Fig. 7.**—Squamous cell carcinomas are the most common in sun-exposed skin. One type appears as scaly patch with irregular borders; may crust or bleed.



**Fig. 8.**—Another type of squamous cell carcinoma appears as an elevated growth with central depression; bleeds occasionally. Other types may be wartlike growths or persistent open sores, both with crusting and bleeding.



## Basal Cell Carcinoma Is the Most Common of All Skin Cancers.

The Five Warning Signs Are Illustrated Below:



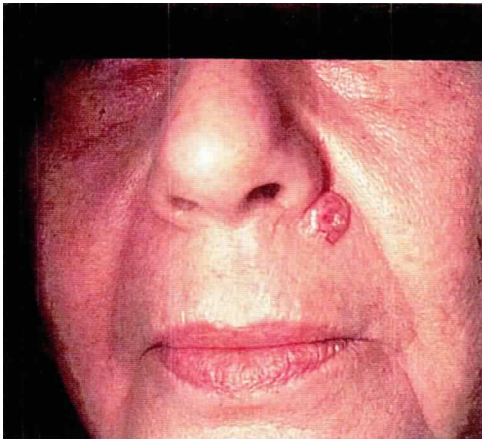
**Fig. 9.**



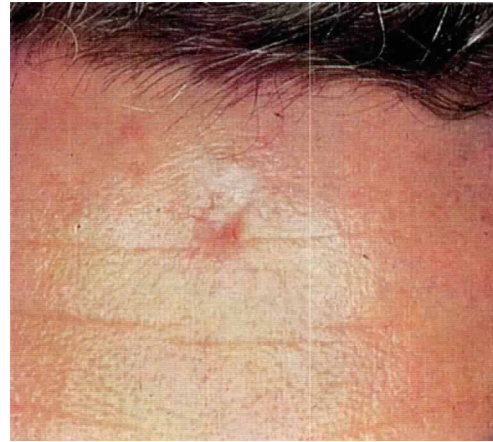
**Fig. 10.**



**Fig. 11.**



**Fig. 12.**



**Fig. 13.**

**Fig. 9.**—A sore that remains open for 3 weeks or longer, and bleeds, oozes, or crusts.

**Fig. 10.**—An irritated area or reddish patch that may crust, itch, or hurt, occurring on the chest, shoulders, arms, legs, or other areas.

**Fig. 11.**—A smooth growth with an indentation in the center and an elevated, rolled border. Note small blood vessels developing on the surface.

**Fig. 12.**—A translucent shiny nodule that may be pink, red, or white; may be confused with a nevus

**Fig. 13.**—A scarlike area with poorly defined borders; skin appears shiny and taut with a white, yellow, or waxy look.



## SUNSCREENS AND CHILDREN

There are many controversies surrounding the use of children's sunscreens. A major concern is that parents may think that a child wearing a high-SPF sunscreen can stay out in the sun for prolonged periods. It is crucial to explain to parents that excessive sun exposure in childhood is linked with a significantly increased risk of skin cancer later in life.

There is evidence that one serious sunburn in childhood can double a person's risk of skin cancer later in life. Other studies have shown that 80% of one's lifetime exposure to UV light is received before the age of 18. These data underline the importance of protecting children from excessive sun exposure and using effective sunscreens when they are in the sun. It has been estimated that regular use of SPF 15 sunscreens in childhood could reduce the incidence of skin cancer by 78%.

The best way for parents to get children into the habit of using sunscreens is to set an example by using them routinely themselves. A variety of sunscreens are formulated specifically for use on children, including nonalcohol-based products that do not sting when applied to the skin. Parents with active young children may find spray formulations especially convenient to apply. Colorful packaging also may make the sunscreen more acceptable to a child.

In addition to using sunscreens, parents should be encouraged to dress their children in sun-protective clothing and to instruct them to seek shade when playing outdoors. In Australia, it has now been mandated that schools not send children out for playtime between the hours of 11:00 a.m. and 2:00 p.m., when the sun is at its height. In the U.S., of course, midday is a common period for lunch and outdoor free play. Recently, parents' groups in some communities have requested that schools modify outdoor play schedules and/or provide shaded areas for outdoor activities. Planting additional trees along sidewalks and providing shelters at bus stops also would help protect both children and adults from unnecessary sun exposure. It is important to note that infants should be kept out of the sun as much as possible, especially between 10:00 a.m. and 3:00 p.m., and that high-SPF sunscreens should be used if any sun exposure is anticipated.



## INNOVATIVE APPROACHES TO SUN PROTECTION

One recent innovation in sunscreens is the development of sunscreening fabrics. Ordinary fabrics, especially those with a loose weave, may transmit a substantial amount of UV light. Manufacturers now have developed a way of treating fabrics with chemically conjugated sunscreens, providing garments with SPFs of 30 and higher. Clothes made of sunscreening fabrics would be very useful for individuals who cannot tolerate sunscreens or who spend a great deal of time outdoors working or engaged in sports. They also would be appropriate for protecting children and photosensitive adults from excessive sun exposure.

In the past, one of the major limitations to the use of mechanical sunblocking preparations, such as zinc oxide and titanium dioxide, had been their unacceptable appearance and feel. Now, products have been developed that incorporate micronized powders of zinc oxide and titanium dioxide, greatly improving the products' cosmetic acceptability. These products, which provide partial coverage against UVA as well as UVB radiations, are frequently advertised as "nonchemical" or "natural" sunblocks.

There also has been considerable interest in ingested sunscreens. One approach being investigated is to somehow enhance the body's resistance to the harmful effects of UV radiation. A variety of agents, including antioxidants such as beta-carotene, vitamin E, and ascorbic acid, are being studied, but none has yet been established to be safe and effective.

A promising new technology may allow for the incorporation of UV-absorbing melanosomes into topical sunscreens. This would provide a more physiologic method of blocking out harmful UV light than products currently provide. It appears that sunscreens using this technology may be marketed in the relatively near future.

A device has recently been marketed, in the form of an adhesive patch worn on the skin, that purports to monitor UV exposure so patients can gauge how long they can remain safely in the sun. These devices may have some limited educational value, because they provide a dramatic illustration of the intensity of UV radiation. Their drawback is that they may lull patients into a false sense of security by suggesting that they can sunbathe safely up to some arbitrary limit of exposure.





## EDUCATING YOUR PATIENTS ABOUT SKIN CANCER PREVENTION:

### 3 SIMPLE STEPS

Pharmacists have numerous opportunities to provide skin cancer prevention information. Some of these opportunities will be fairly obvious, such as when filling a prescription for a photosensitive medication or when a patient inquires about sunscreen products. Other opportunities may not be as obvious but can be just as effective, such as when counseling for a new prescription or answering the patient's question about a drug interaction. In fact, the majority of pharmacist-patient interactions can be viewed as opportunities for "sunwise" education. Here are 3 simple steps (the 3 A's) for patient education:

**ASK** your patients if they and their family are practicing healthy skin habits. For example:

*Do you protect your (and your children's) skin from the sun?*

*Do you use sunscreen?*

*Do you wear protective clothing when outside?*

*Do you limit your time in the sun?*

**ADVISE** patients they can and should reduce their own, and their family's, skin cancer risk.

Keep the advice simple and use lay terms.

Try to *personalize* the information. For example, a parent picking up his/her child's prescription could be told about the effects of sun exposure early in life. Young adults could be told about the damaging effects of sun exposure in addition to cancer, such as wrinkling.

**ASSIST** patients in selecting risk reducing strategies.

Discuss simple behaviors: avoiding peak sunlight hours; wearing sunscreens and other products such as moisturizers with SPF 15; wearing long-sleeves, pants, a hat, and sunglasses.

Encourage patients to ask questions.

Give your patients skin cancer prevention brochures and sunscreen samples.

The 3 A's are geared towards *brief* pharmacist-patient interactions. Depending on time-constraints, you may choose to apply all 3 of the steps, or only 1 or 2 of them. For example, when time is especially limited, simply handing patients a brochure (perhaps at the termination of new prescription counseling) can be valuable to them.



## **EDUCATING YOUR PATIENTS ABOUT SKIN CANCER: QUESTIONS AND ANSWERS**

This and the following pages contain skin cancer information in a question and answer format. The answers are written using basic (non-medical) terminology and can be used in assisting patients with questions they may have about skin cancer.

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### **Questions and Answers Skin Cancer**

**Q. What is skin cancer?**

**A.** Skin cancer is a condition caused by uncontrolled growth of malignant cells in one of the layers of the skin.

**Q. What causes skin cancer?**

**A.** Prolonged and/or intermittent overexposure to the ultraviolet radiation from the sun is the primary cause of skin cancer. Ninety percent of all skin cancers occur on parts of the body that are unprotected by clothing, and in individuals who spend long hours in the sun. Less common causes include overexposure to X-rays or chemical carcinogens such as arsenic.

**Q. Are all skin cancers alike?**

**A.** No, there are several different kinds of skin cancer. The three most common types are basal cell carcinoma, squamous cell carcinoma, and malignant melanoma.

**Q. What is the most serious form of skin cancer?**

**A.** Malignant melanoma is the most serious form of skin cancer and can be fatal. It is responsible for 75 percent of all skin cancer deaths. If untreated, it can spread throughout the entire body. It is estimated that in 1996, malignant melanoma will affect more than 38,000 people, causing 9,400 deaths. Another 2,100 deaths will be caused by non-melanoma skin cancers.



## Questions and Answers

### Skin Cancer - continued

**Q.** Who gets skin cancer?

- A.** Skin cancer can affect anyone, but some people are at greater risk. Individuals at a greater risk are those who:
- Have fair skin and sunburn easily
  - Work outdoors and otherwise are exposed to considerable sunlight
  - Have had severe childhood or adolescent sunburns
  - Have higher than average numbers of moles
  - Have multiple atypical moles (unusual moles)
  - Suffer from genetic diseases characterized by sunlight intolerance (such as albinism)
  - Geographically located in latitudes near the equator
  - Have a family history of skin cancer

**Q.** How many people will get skin cancer?

- A.** About one million new cases of skin cancer will be diagnosed in 1996. At this alarming rate, one in six Americans will develop skin cancer in his/her lifetime.

**Q.** Can skin cancer be prevented?

- A.** Yes. It is believed that 3/4 of all skin cancers can be prevented if simple precautions against the sun's ultraviolet radiation are taken.

**Q.** Can skin cancer be cured?

- A.** Yes, when detected and treated early, most skin cancers can be treated successfully and often cured.

**Q.** How do I recognize the signs of skin cancer?

- A.** Skin cancer, especially in the early stages, may not look like an abnormal growth. For this reason, identification and familiarity with moles and other skin markings are important. Changes in color, size, shape, elevation, sensation, and surface appearance of the skin should be suspect. Skin self examinations should be performed once a month. Any unusual growth should be examined by a doctor.

**Q.** How do I prevent skin cancer?

- A.** If you are fair-skinned, or have a family history of severe burning, avoid unnecessary sun exposure. If you spend time in the sun, be sure to protect yourself by wearing protective clothing (hats, etc.), avoiding direct sun exposure between 10:00 a.m. and 3:00 p.m., and applying sunscreen with a Sun Protection Factor (SPF) of 15 or higher.



## Questions and Answers

### Basal Cell Carcinoma

**Q.** What is basal cell carcinoma?

**A.** Basal cell carcinoma is a form of skin cancer that develops in the basal layers of the cells that make up the epidermis of the skin. It is the most common form of skin cancer.

**Q.** Is basal cell carcinoma serious?

**A.** Basal cell carcinoma can cause a considerable amount of damage and disfigurement to the skin if it is not treated promptly.

**Q.** How many people will develop basal cell carcinoma?

**A.** It is estimated that more than 550,000 people in the U.S. will be affected by basal cell carcinoma in 1996 alone.

**Q.** What causes basal cell carcinoma?

**A.** The main cause of basal cell carcinoma is overexposure to ultraviolet radiation from the sun.

**Q.** Who gets basal cell carcinoma?

**A.** Anyone who spends, or has spent, prolonged periods in the sun is at risk for developing this form of skin cancer. It affects more men than women.

**Q.** What does basal cell carcinoma look like?

**A.** Basal cell carcinomas usually appear as slowly growing, raised, translucent, pearly nodules which, if untreated, may crust, ulcerate, and sometimes bleed.

**Q.** Can basal cell carcinoma be prevented?

**A.** Yes. Overexposure to ultraviolet light is thought to be a major cause of basal cell carcinoma. Try to avoid unnecessary sun exposure and peak sunlight hours (10:00 a.m. to 3:00 p.m.), wear protective clothing (hat with a brim, long-sleeved shirts, and pants) during prolonged periods of sun exposure, and apply a sunscreen with a Sun Protective Factor (SPF) of at least 15.



## Questions and Answers

### Squamous Cell Carcinoma

**Q.** What is squamous cell carcinoma?

**A.** Squamous cell carcinoma is a form of skin cancer that arises from the epidermis of the skin.

**Q.** Is squamous cell carcinoma serious?

**A.** Yes. Squamous cell carcinoma can grow in size, occasionally developing into large, ulcerating, mushroom-like tumors. This form of skin cancer has the potential to metastasize.

**Q.** How many people will develop squamous cell carcinoma?

**A.** It is estimated that more than 130,000 people in the U.S. will be affected by squamous cell carcinoma in 1996 alone.

**Q.** What causes squamous cell carcinoma?

**A.** The main cause of squamous cell carcinoma is overexposure to ultraviolet radiation from the sun.

**Q.** Who gets squamous cell carcinoma?

**A.** Anyone can get this form of skin cancer, but it is more common in men. Additionally, the incidence of the disease increases with age.

**Q.** What does squamous cell carcinoma look like?

**A.** Squamous cell carcinomas usually are raised, red or pink, scaly nodules or wart-like growths that ulcerate in the center. They typically develop on the rim of the ears, the face, the lips, mouth, hands, and other sun exposed areas of the body.

**Q.** Can squamous cell carcinoma be prevented?

**A.** Yes. Overexposure to ultraviolet light is thought to be a major cause of squamous cell carcinoma. Try to avoid unnecessary sun exposure and peak sunlight hours (10:00 a.m. to 3:00 p.m.), wear protective clothing (hat with a brim, long-sleeved shirts, and pants) during prolonged periods of sun exposure, and apply a sunscreen with a Sun Protective Factor (SPF) of at least 15.



## Questions and Answers

### Actinic Keratosis

**Q.** What is actinic keratosis?

**A.** Actinic keratosis is a precancerous skin condition that arises from the epidermis, or upper layer of the skin. Actinic keratosis also is referred to as solar keratosis.

**Q.** Is actinic keratosis serious?

**A.** Actinic keratosis, if left untreated, may grow in diameter. It can become more elevated and can develop into other forms of nonmelanoma skin cancer.

**Q.** What causes actinic keratosis?

**A.** The main cause of actinic keratosis is overexposure to ultraviolet radiation from the sun.

**Q.** How common is actinic keratosis?

**A.** It is the most common premalignant condition, occurring in more than five million people in the U.S., mostly in older individuals.

**Q.** What does actinic keratosis look like?

**A.** Actinic keratoses look like slightly raised tan, brownish, grayish or red rough, dry, scaly spots that measure anywhere from about one-quarter inch to one inch in diameter.

**Q.** Can actinic keratosis be prevented?

**A.** With the use of sunscreens containing Sun Protection Factor (SPF) of 15 or higher, sun protection behaviors (e.g., avoiding peak sunlight hours, etc.), and protective clothing (e.g., hats, long-sleeved shirts, and pants), actinic keratoses are preventable.



## Questions and Answers

### Malignant Melanoma

**Q. What is malignant melanoma?**

**A.** Malignant melanoma is a very serious skin cancer characterized by uncontrolled growth of pigment-producing tanning cells.

**Q. Is malignant melanoma serious?**

**A.** Yes. In later stages, malignant melanoma spreads to other organs and may result in death. But if detected in the early stages, melanoma can usually be treated successfully.

**Q. How many people will develop malignant melanoma?**

**A.** An estimated 38,000 people will be diagnosed with malignant melanoma in 1996 in the United States, and 9,400 are expected to die from the disease. The lifetime probability of developing malignant melanoma is now 1 in 105 as compared to 1 in 1,500 in 1930. By the year 2000, 1 in 75 could develop malignant melanoma.

**Q. What causes malignant melanoma?**

**A.** Excessive exposure to ultraviolet radiation from the sun may be a primary cause of melanoma. Other possible causes are genetic factors and immune deficiencies. Malignant melanoma also has been linked to degree of sunburn and sun exposure in youth.

**Q. What are my chances of getting malignant melanoma?**

**A.** Malignant melanoma is less common than other skin cancers, however, it is increasing at a faster rate than any other cancer. Since 1980, the number of cases in the U.S. has risen 96 percent.

**Q. Who gets malignant melanoma?**

**A.** While malignant melanoma can strike anyone, people with fair skin are at greater risk. Unlike nonmelanoma skin cancers, which usually occur in older people, melanoma can occur at any age.

**Q. What are atypical moles?**

**A.** Atypical moles are unusual moles that are generally larger than normal moles, variable in color, and often have irregular borders. The presence of atypical moles may signify a greater risk of developing skin cancer. Careful monitoring of these moles are important.

**Q. What does malignant melanoma look like?**

**A.** Melanoma generally begins as a mottled, light brown to black flat blemish with irregular borders. The blemish is usually at least 1/4 inch in size and may turn shades of red, blue and white, crust on the surface and bleed. Melanoma frequently appears on the upper back, torso, lower legs, head and neck.

**Q. Can malignant melanoma be prevented?**

**A.** Yes. Overexposure to ultraviolet light is thought to be a primary cause of malignant melanoma. Try to avoid unnecessary sun exposure and peak sunlight hours (10:00 a.m. to 3:00 p.m.), wear protective clothing (hat with a brim, long-sleeved shirts, and pants) during prolonged periods of sun exposure, and apply a sunscreen with a Sun Protective Factor (SPF) of at least 15.



## The Best Ways To Prevent Skin Cancer

The American Academy of Dermatology recommends the following precautions to lessen the chances of developing skin cancer:

- ✱ **Minimize Sun Exposure** especially during the peak sun hours of 10:00 a.m. to 3:00 p.m. when the sun's rays are the most intense.
- ✱ **Apply a Sunscreen Liberally and Frequently** and reapply every two hours when working, playing, or exercising outdoors. A sunscreen with a Sun Protection Factor (SPF) of at least 15 is recommended for protection against skin cancer and premature aging of the skin.
- ✱ **Wear Appropriate Clothing** during prolonged periods in the sun, including a wide-brimmed hat, long-sleeved shirt, pants, and sunglasses.
- ✱ **Avoid Tanning Parlors and Sun Lamps** as ultraviolet rays emitted by these artificial sources are similar to those in sunlight and can cause sunburn, premature aging of the skin and an increased risk of skin cancer.
- ✱ **Beware of Reflective Surfaces** such as sand, snow, concrete, and water since they can reflect up to 85 percent of the sun's damaging rays.
- ✱ **Remember to Protect Children** by keeping them out of the sun, especially those under the age of six months. Apply sunscreens on children older than six months of age.
- ✱ **Teach Children and Teenagers** safe sun behaviors, since skin damage from sun exposure accumulates over a lifetime. The majority of damage from the sun occurs before the age of twenty. It takes only one severe sunburn in childhood or adolescence to double the chance of developing skin cancer later in life.

### To detect skin cancer at an early and curable stage:

**Perform Regular Skin Self Examinations** and become familiar with skin appearance and markings. Report any sign of change in color, size, shape, elevation, sensation, and surface appearance of the skin to a doctor immediately.





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## SUMMARY

Because of their accessibility, pharmacists are in an excellent position to educate patients continually and reinforce the importance of preventing sun damage to skin. One particularly effective way to achieve this is to establish a “sunwise” center in the pharmacy. By providing counseling and information, pharmacists can help patients select the most appropriate sunscreen or sunblock product and avoid unnecessary skin damage. Pharmacists not only can enhance their professional satisfaction through patient education, but they also can contribute to improved public health.

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## TEST GRADING OPTIONS

To make it as convenient as possible for you to complete this program, CEPA & Project *SUNWISE* offer you two choices for having your test graded:

Facsimile Grading and Mail-in Grading.

On pages 33-34 you will find a Mail/Facsimile Posttest Answer Sheet.

**FACSIMILE GRADING** - Fax your completed Answer Sheet and the Program Evaluation to  
(619) 594-2998.

**MAIL-IN GRADING** - Enclose your completed Answer Sheet and the Program Evaluation and return to:

Project *SUNWISE*  
San Diego State University  
9245 Sky Park Court, Suite 221  
San Diego, CA 92123

After **September 1, 1997**, please submit completed Answer Sheets and Program Evaluations to:

Mailing address: CEPA  
California Employee Pharmacist Association  
6363 Wilshire Blvd., Ste. 215  
Los Angeles, CA 90048-5701

Fax: (213) 935-1607

## CONTINUING EDUCATION POSTTEST

*Please choose the one correct response for each question and indicate your answers on the answer sheet.*

Certification will be issued upon successful completion of the posttest (70% or better).

1. Which type of skin cancer currently has the greatest incidence?
  - A) Basal cell
  - B) Squamous cell
  - C) Malignant melanoma
2. Reapplying a sunscreen extends the period of protection offered beyond of the product's listed SPF.
  - A) True
  - B) False
3. Which of the following appears to be a safe method of tanning without causing skin damage?
  - A) Gradual, deep tanning with medium-SPF product
  - B) Use of a tanning parlor with exposure primarily to UVA light
  - C) Self-tanning or "sunless" tanning products
  - D) All of the above
  - E) None of the above
4. Which of the following sunscreen chemicals offers protection against the full spectrum of UVA radiation?
  - A) Benzophenone-3
  - B) Oxybenzone
  - C) Parsol<sup>®</sup> 1789
  - D) Padimate O
5. Although they contain higher concentrations of sunscreensing chemicals, products with higher SPF numbers have not been associated with a higher rate of skin allergy and irritant reactions.
  - A) True
  - B) False
6. Patients with a great deal of melanin in their skin (e.g., skin types 5 and 6) do not need to worry about excessive sun exposure.
  - A) True
  - B) False
7. Because patients tend to exaggerate the sensitivity of their skin, they generally pick sunscreen products with SPFs that are higher than necessary.
  - A) True
  - B) False
8. It has been estimated that percent of one's lifetime exposure to UV radiation is received before the age of 18.
  - A) 15%
  - B) 30%
  - C) 50%
  - D) 80%
9. Which of the following innovative technologies is the least promising approach to the prevention of photodamage?
  - A) UV-exposure monitoring devices
  - B) Sunscreening fabrics/clothing
  - C) Micronized powders of zinc oxide and titanium dioxide
  - D) Melanosome-containing sunscreens
10. Which of the following statements about "sunless" agents is not true?
  - A) They stain the stratum corneum.
  - B) They are safe when used correctly.
  - C) They produce a cosmetically acceptable result when properly applied.
  - D) They provide protection against photodamage that is proportional to the degree of tanning achieved.
11. A sunscreen labeled "waterproof" must protect for up to 80 minutes of continuous water exposure.
  - A) True
  - B) False
12. Which of the following medications are considered to be photosensitizing agents?
  - A) Oral contraceptive
  - B) Skin creams containing tretinoin
  - C) Tetracycline
  - D) Oral hypoglycemic agents
  - E) All of the above
  - D) None of the above

# ANSWER SHEET

## Skin Cancer Prevention: A Role for Pharmacists

Universal Program No. 125-000-96-013-H04

Credit: 0.1 CEUs (1 hour of credit)

Please print clearly the information requested below.

SOCIAL SECURITY NO.

[illegible]

Name

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## LICENSE INFORMATION

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Please be sure your social security number is given as requested above. Credit will be granted for the successful completion of this program up to May 21, 1999. For each question, decide on the best answer, and put an X through that letter. Mark only one answer for each question.

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## PROGRAM EVALUATION

### Skin Cancer Prevention: A Role for Pharmacists

*Your opinions are important to us. Please circle your responses below.*

**1. Did this educational activity meet your expectations?**

Fell short                      1              2              3              4              5              Exceeded

**2. How well was the information presented?**

Poorly                      1              2              3              4              5              Excellently

**3. Was the program content relevant to your practice?**

Not very                      1              2              3              4              5              Extremely

**4. How much new information did the program provide?**

Little                      1              2              3              4              5              A great deal

**5. I believe that the combination of videotape with supplemental monograph is an effective medium for continuing pharmaceutical education.**

Strongly disagree              1              2              3              4              5              Strongly agree

**Additional suggestions for future continuing education programs:**

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*Thank you for participating in this evaluation.*



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## CREDITS

Produced by Project *SUNWISE*, Graduate School of Public Health, San Diego State University, San Diego, California.

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Information on Table 2 is from the following sources:

*The Letter on Medical Drugs and Therapeutics*, vol. 37, Ap. 14, 1995

Reed and Camrick (Reminder List), Division of Block Drug Company, Inc., Jersey City, NJ 07302, 1995

*Medications That Increase Sensitivity to Light*, 1992 USFDA Revised Listing, Jerome I. Levine, M.S., R.Ph., United States Food and Drug Administration, edited and reproduced by the Illinois department of Public Health, 1992.

Figs. 2-5 and 7-13 courtesy of The Skin Cancer Foundation, New York, New York.

The *3 Simple Steps (Ask, Advise, Assist)* adapted from “How To Help Your Patients Stop Smoking: A National Cancer Institute Manual for Physicians”, by Thomas J. Glynn and Marc W. Manley, NIH Publication #95-3064, 1995.

*Questions and Answers* adapted from Skin Cancer Fact Sheets, provided by the American Academy of Dermatology, 1995. Statistics refer to the United States and are based on estimates for 1996 from the American Cancer Society.

Portions of this monograph are from Sun. Skin Cancer. and Sunscreens, Glaxo Dermatology, 1994.

Graphic Design: Maggie Price.

The opinions expressed in this series are those of the physician and pharmacist consultants and are not to be construed as the opinions or recommendations of Project *SUNWISE* or CEPA. Please see complete Prescribing Information for any drugs or devices discussed.



## NOTES





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