
SKIN CANCER PREVENTIVE BEHAVIOR AND SUN PROTECTION RECOMMENDATIONS

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OBJECTIVES: *To summarize, in tabular form, the current literature and information available for skin cancer preventive behaviors and sun protection recommendations.*

DATA SOURCES: *Peer-reviewed literature, web sites of professional and federal organizations.*

CONCLUSION: *The link between skin cancer and ultra-violet radiation (UVR) exposure is well documented. Primary skin cancer prevention must focus on proven ways to reduce the amount of UVR that reaches the skin, including avoiding UVR, covering up, wearing a wide-brimmed hat and sunglasses and use of sunscreen.*

IMPLICATIONS FOR NURSING PRACTICE: *Nurses play a key role in patient education and should use evidence-based resources to provide skin cancer prevention recommendations.*

KEY WORDS: *skin cancer, sunscreen, prevention, sun protection*

THE link between skin cancer and ultraviolet radiation (UVR) exposure is well documented. UVR penetrates skin and causes damage that may lead

to non-melanoma skin cancer or melanoma.¹⁻³ UVR also damages the eyes (potentially influencing development of ocular melanoma, cataracts).⁴ Tanning bed use also greatly increases

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the risk of skin cancer.^{5,6} The International Agency for Research on Cancer classified UVR-emitting tanning devices as “carcinogenic to humans” in 2006.³ Melanoma risk may increase significantly if first exposure to a tanning bed is before 35 years of age.^{3,5} Primary skin cancer prevention behaviors that focus on proven ways to reduce the amount of UVR reaching

the skin include avoiding UVR exposure, covering sun-exposed skin, wearing a wide-brimmed hat and sunglasses, and sunscreen use.⁷ There is little research or evidence for primary prevention behaviors influencing decreased skin cancer recurrence. Table 1 provides recommendations for sun protection behavior and rationale.⁷⁻²⁰

TABLE 1.
Sun Protection Behavior

Recommendations	Rationale
Avoid natural and artificial UVR	<ul style="list-style-type: none"> • Avoid sun exposure from 10AM-4PM when UVR is most damaging to the skin.⁷ Use another form of sun protection if avoidance is not possible. • Stay in the shade for optimal (but not complete) protection. Shade protection relies on shade density, shade structure, season, and sun angles.¹ UVR bounces off reflective surfaces such as sand, concrete, or water.⁸ • Avoid indoor tanning beds. Skin cancers, including melanoma, are linked to the use of tanning beds.^{5,6}
Cover up with clothing	<ul style="list-style-type: none"> • Wear long sleeves and long pants to cover UVR-exposed skin.⁹ • Choose dark colors, tight weaves, and thick fabrics, which UVR is less able to penetrate. Light colors, loose weaves, and thin fabrics allow much more UVR to reach the skin.^{10,11} • Choose fabrics labeled as having UPF of 40 or higher.^{12,13} These are effective alternatives to fabrics such as linen and white cotton, which have very low UPF ratings.¹⁴ UPF fabrics with a high rating are specially treated or constructed of fibers that naturally block and/or absorb UVR before it reaches the skin.
Wear sunglasses in combination with a wide-brimmed hat that shades the eyes and face	<ul style="list-style-type: none"> • Wear large-framed, wrap-around sunglasses in combination with a wide-brimmed hat for optimal eye protection.¹⁵ Evidence suggests wearing sunglasses alone may not adequately protect eyes because of poor construction and fit.^{16,17} Adding the protective shade of a hat may reduce this risk. • Choose sunglasses with 99% to 100% UVA/UVB protection.^{15,18-20} This value may also be reported as 400 nm. • Wear UVR-blocking contact lenses that reduce the amount of radiation that reaches the surface of eye and protects the eye from UVR entering from the periphery of ill-fitting sunglasses.¹⁷ Little evidence exists for the protective values of clear, UVR-treated prescription glasses.

Abbreviations: nm, nanometers; UPF, ultraviolet protective factor; UVR, ultraviolet radiation; UVA, ultraviolet A radiation; UVB, ultraviolet B radiation.

TABLE 2.
Sunscreen Recommendations and Rationale

Sunscreen Recommendations	Rationale
Use quality sunscreen	<ul style="list-style-type: none"> Use a product labeled with an SPF of 15 to 30 or greater.^{24,25} Use SPF as a comparison between product coverage, not to determine absolute protection.²⁶ Use “broad spectrum” sunscreen to protect against skin cancer and not just sunburn.²⁷ For a product to be labeled as “broad spectrum” it must offer protection against both UVA and UVB.²³
Apply the appropriate amount	<ul style="list-style-type: none"> Read the directions on the sunscreen product. The product label may use the terminology “Apply Liberally.” To achieve the labeled SPF level, apply the product in a thickness of 2 mg/cm². Thickness is based on the definition of SPF, which is the ratio of the dose of UVR required to produce one MED on sunscreen-protected skin after application of 2 mg/cm² of product.²⁸ MED is the lowest dose of UVR that produces perceptible reddening of the skin. The thickness volume has been interpreted as “The Teaspoon Rule” for ease of consumer understanding.^{29,30} Consumers typically do not apply this much³¹ and should engage in other sun protection behaviors described to compensate for lowered actual SPF. Decreased SPF associated with decreased application volume is linear-to-exponential, depending on the product, skin type, and body area of application typically resulting in an SPF of less than half of the labeled SPF (specifically the SPF should be divided by 1.5 to 3.8 for half an application of 1 mg/cm²).³²⁻³⁴
Apply and re-apply at the appropriate time	<ul style="list-style-type: none"> Apply sunscreen 15 minutes before sun exposure.²³ Re-apply sunscreen within 15 to 60 minutes after exposure to increase the thickness and uniformity of coverage and compensate for uneven application.^{31,35-37} Re-apply sunscreen every 2 hours or after swimming or sweating.^{23,38} The SPF value of a product decreases by 25% after 8 hours without activity and by about 55% with activity.³⁹
Use sunscreens that are water resistant	<ul style="list-style-type: none"> Note that there is no water-proof sunscreen. The new FDA labeling specifies water-resistance up to 40 or 80 minutes.²⁰ Only use a product specifically designed for use in water.
Note sunscreen expiration information	<ul style="list-style-type: none"> FDA guidelines²³ specify that all sunscreens must retain their original strength for 3 years. Store sunscreens in a cool location; the expiration date does not account for degradation that results from heat (in a car or in the sun).

Abbreviations: FDA, US Food and Drug Administration; MED, minimum erythema dose; SPF, sun protection factor; UVR, ultraviolet radiation; UVA, ultraviolet A radiation; UVB, ultraviolet B radiation.

Sunscreen protects against the acute, sunburn-causing effects of UVR and chronic UVR exposure that can result in photoaging and skin cancer.^{21,22} In combination with sun-safe behaviors, sunscreen can reduce the risk of skin cancer and early skin

aging.²³ New US Food and Drug Administration sunscreen product labels are available at: <http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/UCM258910.pdf>. Table 2 provides recommendations and rationale for sunscreen use.

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Preventing skin cancer by protecting yourself completely requires a comprehensive approach. The Skin Cancer Foundation recommends these strategies. Skin Cancer Prevention. Protect Yourself With a Complete Approach. UV radiation from the sun isn't just dangerous, it's also sneaky. Not only can it cause premature aging and skin cancer, it reaches you even when you're trying to avoid it—penetrating clouds and glass, and bouncing off of snow, water and sand. What's more, sun damage accumulates over the years, from prolonged outdoor exposure to simple activities like walking the dog, going from your car to the store and bringing in the mail. Get all the details: Your Daily Sun Protection Guide. Skin Cancer Prevention PDF. Sunscreen. These behaviors include wearing protective clothing, reducing excessive sun exposure, avoiding sun lamps and tanning beds, or practicing skin self-examination. The USPSTF, an independent panel of private sector experts in primary care and prevention, systematically reviews the evidence of effectiveness of a wide range of clinical preventive services, including screening tests, counseling, and chemoprevention. Ferrini RL, Perlman M, Hill L. Skin protection from ultraviolet light exposure: American College of Preventive Medicine Practice Policy Statement. Washington, DC: American College of Preventive Medicine. Available at <http://www.acpm.org/skinprot.htm>. Objectives: To summarize, in tabular form, the current literature and information available for skin cancer preventive behaviors and sun protection recommendations. Data sources: Peer-reviewed literature, web sites of professional and federal organizations. Conclusion: The link between skin cancer and ultra-violet radiation (UVR) exposure is well documented. Primary skin cancer prevention must focus on proven ways to reduce the amount of UVR that reaches the skin, including avoiding UVR, covering up, wearing a wide-brimmed hat and sunglasses and use of sunscreen. Implications for nursing practice: Nurses play a key role in patient education and should use evidence-based resources to provide skin cancer prevention recommendations. Skin cancer prevention activities may inadvertently reduce physical activity levels as people aim to avoid exposure to the sun. It is important that prevention activities do not discourage outdoor physical activity but, rather, encourage people to use sensible skin protection. Behaviour change. The principles outlined in NICE's behaviour change: general approaches guidance (see section 7) were used as the basis for making recommendations on how to change people's health-related behaviours. That guidance highlights the need for careful planning that takes into account the local and national con... Behavioral counseling interventions target sun-protection behaviors to reduce UV radiation exposure. UV radiation is a known carcinogen that damages DNA and causes most skin cancer cases. A substantial body of observational evidence demonstrates that the strongest connection between UV radiation exposure and skin cancer results from exposure in childhood and adolescence. Sun-protection behaviors include the use of broad-spectrum sunscreen with a sun-protection factor of 15 or greater; wearing hats, sunglasses, or sun-protective clothing; avoiding sun exposure; seeking shade during midday hours (10 am to 4 pm); and avoiding indoor tanning bed use. Screening for skin cancer: US Preventive Services Task Force recommendation statement. JAMA.