



Perspective

Topical sunscreens: Best practices

Deepthi Konda¹

¹Department of Dermatology, All India Institute of Medical Sciences, Aushapur, Telangana, India.



***Corresponding author:**

Deepthi Konda,
Department of Dermatology,
All India Institute of Medical
Sciences, Aushapur, Telangana,
India.

knddeepthi@gmail.com

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ABSTRACT

Topical sunscreens have been widely used for more than 40 years by people for their photoprotective properties, including the prevention of photocarcinogenesis, photoaging, and management of photodermatoses. However, for it to be effective, knowledge of a good sunscreen and its technically correct application is of utmost importance. It is important to emphasize to consumers the necessity of broad-spectrum protection, with coverage of both ultraviolet (UV) A (320–400 nm) and UV B (290–320 nm) radiation. This perspective discusses the effects of UV rays on the skin, the benefits of sunscreen, different types of sunscreens, how to select a good sunscreen, the correct method of application of sunscreen, and sunscreens in pregnancy and children.

Keywords: Sunscreens, Ultraviolet rays, Skin cancer

INTRODUCTION

Solar ultraviolet radiation (UVR) consists of ultraviolet A (UVA) (320–400 nm), ultraviolet B (UVB) (280–320 nm), and ultraviolet C (UVC) (100–280 nm). UVC is completely absorbed by the ozone and does not reach the earth's surface. UVB is the major portion of UVR that induces sunburns or ultraviolet (UV)-induced erythema. UVB is highly associated with the development of squamous cell carcinomas. UVB has also been shown to induce matrix metalloproteinases (MMPs), reactive oxygen species, and elastases involved in photoaging.^[1] UVB is predominantly absorbed by the skin's epidermis, whereas UVA has a longer wavelength and therefore deeper dermal penetration, making it the primary driver of photoaging. Increasing levels of MMP-1 and MMP-3 were observed in a dose-dependent response in the dermis, further highlighting the role of UVA in collagen breakdown and photoaging. There is increasing evidence that infrared light (700 nm–1 mm) and visible light (VL) (400–700 nm), predominantly in the blue light range (380–455 nm), also play a role in photodamage and photoaging.^[2]

WHY TO USE A SUNSCREEN?

Regular and proper use of sunscreens is shown to reduce the risk of developing skin cancer, prevent sunburn/tanning, and decrease or delay the signs of early photoaging such as wrinkles, freckles, and sagging skin. Sunscreens also play an important role as supportive therapy in the management of photo-induced and/or photo-exacerbated conditions such as melasma, and systemic lupus erythematosus including genodermatoses such as xeroderma pigmentosum.

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TYPES OF SUNSCREEN

Sunscreens are broadly categorized as physical and chemical sunscreens. Physical (mineral) sunscreen contains titanium dioxide and/or zinc oxide which form a shield on the skin's surface and reflect the UV rays, thus protecting the skin from its harmful rays. These sunscreens form a white cast on the skin which makes it cosmetically less acceptable. On the other hand, chemical sunscreens contain many possible active ingredients, including oxybenzone or avobenzone, octisalate, octocrylene, homosalate, and octinoxate. They absorb the UV rays and mitigate their adverse effects on the skin. They do not form any white cast and thus are cosmetically more acceptable. A third type of sunscreen has been recently added, that is, tinted sunscreen. It is a sunscreen with a pigment offering light to medium makeup coverage. Tinted sunscreens have various combinations of iron oxides and pigmentary titanium dioxide and are thus available in various shades to suit the people of all Fitzpatrick skin types and offer protection against UV rays and VL.^[3] Sunscreens are available in various formulations such as gel (oily skin), cream/lotion (dry skin), stick (around the eyes), and spray sunscreen (larger areas like the back).

WHAT IS A GOOD SUNSCREEN?

With a zillion sunscreen products available in the market, it is quite overwhelming to choose a sunscreen. Hence, the following three features have to be looked for while selecting a sunscreen:

Broad spectrum

It means that the sunscreen can protect the skin from both types of harmful UV rays – the UVA rays and the UVB rays and also the VL.

SPF 30 or higher

It is seen that sunscreen with a sunburn protection factor, that is, SPF 15 protects against 93% of the sun's UVB rays, SPF against 97% of the sun's UVB rays, and SPF 50 against 98–99% of the sun's UVB rays. SPF beyond 50 does not offer any extra protection. Furthermore, no sunscreen can filter out 100% of the sun's UVB rays. Hence, SPF 30 is the minimum required to offer good photoprotection.

Water resistant

Sweat and water are bound to wash away the sunscreen from our skin and thus, no sunscreen is waterproof. Water resistance is the duration during which sunscreen stays on wet skin before its effect is lost. Water resistance lasts either 40 min (water resistant) or 80 min (very water resistant).^[4]

However, the use of only sunscreen will not offer complete protection against UV rays and whenever possible, sunscreen should be combined with any of the photoprotective measures such as seeking shade, wearing sun-protective clothing – such as a lightweight and long-sleeved shirt, pants, a wide-brimmed hat, sunglasses with UV protection, and clothing with an UV protection factor label.

HOW TO APPLY SUNSCREEN?

Sunscreen can protect your skin against skin cancer and premature aging. However, it is not as effective unless it is applied correctly.

1. Apply sunscreen 15–20 min before going outdoors
2. Use enough sunscreen: One-fourth of a teaspoon or three-finger length quantity for the face and neck, rub the sunscreen thoroughly into your skin
3. Apply sunscreen to all skin not covered by clothing including the face, ears, neck, forearms, arms, dorsum of the feet, and legs
4. Sunscreen has to be applied even on cloudy days (clouds are known to block only 20% of UV rays), indoors, and while traveling in cars (glass cannot block UVA rays)
5. Reapply sunscreen every 2 h. This is because the sun's rays break down some sunscreens and others clump and lose their effectiveness
6. Reapply sunscreen after swimming or sweating as water is bound to wash away the sunscreen from the skin.^[2,4]

SUNSCREEN AND PREGNANCY

Topical sunscreens are to be used regularly as mentioned above even by a pregnant and lactating woman similar to a non-pregnant woman.^[5]

SUNSCREEN AND CHILDREN

The American Academy of Dermatology recommends avoiding sunscreen in children <6 months of age. In children, 6 months of age and older, physical sunscreens that have zinc oxide or titanium dioxide are to be used preferably as their skin is very sensitive. However, physical measures such as long-sleeved shirts, pants, and wide-brimmed hats should still be the main mode of sun protection for children.^[4]

CONCLUSION

Topical sunscreen is one of the most effective tools to prevent/delay skin cancer and photoaging. However, it has to be used regularly and applied correctly for it to be effective. Hence, this perspective provides knowledge on the proper selection and application of sunscreen.

Declaration of patient consent

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Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The author confirms that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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