

# Patient Information Sheet

INDIAN ASSOCIATION OF DERMATOLOGISTS, VENEREOLOGISTS AND LEPROLOGISTS

## USE OF SUNSCREENS

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- What is a sunscreen and how do they work?
- What are the ingredients of chemical and physical sunscreens?
- What does 'broad-spectrum' mean?
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### 14. When should I use sunscreen?

Use of sunscreens should be on daily basis especially when outside as harmful UV rays are emitted year-round. Even on cloudy days, 80 percent of UV rays can go into the skin. Snow, sand and water reflect the Sun's rays, making sunscreen use a necessity.

### 15. Do I need to use sunscreen indoors?

Windows at home, or vehicles allow UVA rays to pass through, so sunscreens may be used indoors.

### 16. Sunscreen should be applied before or after moisturizer?

A light moisturizer should be applied first, followed by sunscreen.

### 17. Can sunscreens be used with makeup?

Most cosmetic formulas lack enough protection against UA rays, so sunscreen can be applied under makeup.

### 18. Is sunscreen safe to use?

According to FDA, titanium dioxide and zinc oxide which are ingredients of sunscreen are generally recognized as "safe and effective" (GRASE).

Safety concerns about ingredients in chemical sunscreens (namely oxybenzone) stem from the fact that these ingredients can lead to skin irritation and even cancer as they can be absorbed through the skin. But no studies have shown harmful effects in humans, despite the evidence of absorption.

Side effects of sunscreens

- ▶ Skin sensitivity
- ▶ Serious allergic reaction (itching / swelling of face / tongue / throat, rash, dizziness and breathing difficulties)

### 19. How long can sunscreens be stored?

The shelf life for sunscreens is 30 months, they should be stored in a cool, dry place, out of direct sunlight to maximize their quality as sunscreens are emulsions of oil and water, they tend to separate and the time taken for this would depend on the quality of the formulation and can vary from few months to many years.

### 20. Do sunscreens expire?

US Food and Drug Administration regulations require all sunscreens to have an expiry date and sunscreen that don't have an expiry date should be considered expired three years after purchase. Once the sunscreen has expired, it should be discarded as it becomes less effective, reducing the SPF thereby increasing the sunburn risk.

### 21. Should sunscreens be used in children?

Children are more sensitive to the sun and are also at higher risk than adults to get sunburn, resulting in more DNA damage in response to the same amount of sunshine as adults. Thus, regular sunscreen application is imperative for children. Physical blockers are considered safer in children.

### 22. Should sunscreens be used in babies?

In infants less than six months of age, sunscreen should be avoided as their skin is thinner than that of adults, allowing absorption of chemical ingredients in sunscreen more easily (as compared to adults). This may increase the risk of development of an allergic reaction. So, for babies physical protection like protective clothing and broad-brimmed hats are effective sun protective measures. If these are used properly, sunscreens would be required only on very small areas. Only sensitive sunscreens are to be used in babies if needed as they are protective (sunscreens with scattering ingredients, ingredients and preservatives that may cause reactions are avoided).

For infants above six months, sunscreen which is broad-spectrum, water-resistant and SPF 30 should be preferred. Physical or special sunscreens specially made for infants are recommended as they are less irritating to them.

### 23. Does sunscreen use cause deficiency of vitamin D?

Vitamin D required for healthy bones is produced in the skin by the UV rays in sunlight. As sunscreens are designed to absorb UV, it might be thought that applying sunscreens would affect vitamin D production. Sunscreens tested in laboratory conditions do not block vitamin D production and their daily use has negligible effect on vitamin D levels. The reasons for which are

- ▶ Usually less quantity of sunscreen is applied than the amount used by the manufacturers in the testing process.
- ▶ It is not applied uniformly, so some areas of skin will have little or no protection.

- ▶ Very few sunscreen users re-apply sunscreen.
- ▶ Sunscreen are mostly used during recreational exposure, so a sufficient thin layer of sunscreen will be there even on the areas of skin that are protected during that time of exposure, allowing adequate UV penetration through the skin to produce vitamin D.
- ▶ Vitamin D is synthesized in the skin on a daily basis and many do not apply sunscreen during daily sun exposure.

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Weblink to Patient Information Leaflet:  
[www.iadvl.org/patient-information-leaflet](http://www.iadvl.org/patient-information-leaflet)

## 1. What is UVA, UVB and UVC radiation?

Ultraviolet (UV) radiation, invisible energy from the sun is mainly responsible for causing skin cancer, premature aging and other sign of sun damage. UV radiation is transmitted in three wavelengths; namely UVA, UVB and UVC. This radiation can be increased by reflections of the Sun's rays. Snow increases the radiation upto 85%, sand upto 17% and water upto 5%.

### ▶ UVA

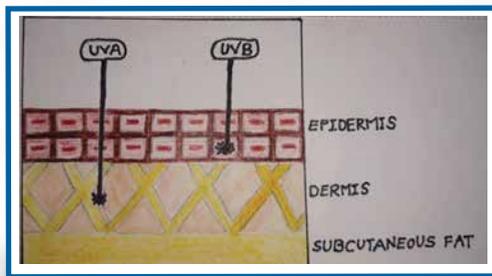
They are long-wavelength rays of 320-400 nm and comprise the majority of UV radiation which reaches the surface of the Earth. They do not get blocked by glass, clouds or Ozone layer. As their penetration in the skin is more deep than UVB, they affect the cells of the skin, causing ageing changes in the form of coarse wrinkles, rough and leathery skin, brown pigmentation and skin cancer. Thus a sunscreen with UVA protection will reduce signs of ageing and development of skin cancer.

### ▶ UVB

They are shorter-wavelength rays of 290-320 nm, mostly absorbed by the Ozone layer. Penetrating the top layers of skin, UVB rays are mainly responsible for skin damage including sunburn and skin cancer, which can be reduced by use of sunscreen with a high sun protection factor (SPF).

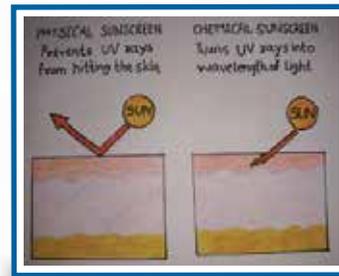
### ▶ UVC

They are very short-wavelength rays of 200-290 nm. They are blocked by the Ozone layer. They cannot reach human skin as they do not reach the Earth's surface,



## 2. What is a sunscreen and how do they work?

Sunscreen is a topical product to be applied to the skin, absorbing or reflecting proportion of the UV rays from penetrating and damaging the skin. Chemical sunscreens that absorb UV radiation, consist of mixture of organic filters/chemicals. Physical sunscreens that contain inorganic filters/chemicals prevent UV rays from penetrating the skin by scattering them away from the skin. Chemicals called excipients are used to formulate and give them cosmetic feel.



## 3. What are the ingredients of chemical and physical sunscreens?

Physical sunscreens containing ingredients like zinc oxide and/or titanium dioxide are recommended for sensitive skin.

Active ingredients of chemical sunscreens are oxybenzone, avobenzene, octisalate, octocrylene, homosalate, and octinoxate.

## 4. What does 'broad-spectrum' mean?

Broad spectrum protection refers to protection from both UVA and UVB spectrum from at least 370nm to 280nm.

ACTIVE INGREDIENT	UVB protection	UVA protection
Zinc Oxide	Yes	Yes
Titanium Dioxide	Yes	Yes
Octocrylene	Yes	No
Octisalate	Yes	No
Octinoxate	Yes	No
Avobenzene	Yes	Yes

LABORATORY BROAD SPECTRUM

## 5. What is "Sun Protection Factor (SPF)"?

Sun Protection Factor is sunburn protection provided by sunscreens and is interpreted as how much time skin covered with sunscreen takes to burn in comparison with unprotected skin. On the basis of the level of protection offered by sunscreen, SPF is rated on a scale of 6-50+. Ratings of 6 to 14 and 50+ offer the least and strongest form of protection respectively. Adequate sun protection is obtained by sunscreen with SPF30.

## 6. What is "photostability" of sunscreen?

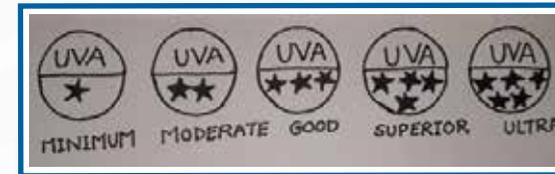
'Photostability' means that the UV filters of sunscreens do not degrade on sun exposure.

## 7. What is "Water resistance"?

Ability of a sunscreen to retain its sun protection properties for a certain time after immersion in water is known as "water resistance".

## 8. What is "UVA star system"?

The percentage of UVA radiation absorbed by the sunscreen in comparison to UVB indicates the UVA star rating and ranges from 0 to 5. Sunscreen with rating of 4 or 5 stars and SPF 30 gives good standard of sun protection.



## 9. What are the types of sunscreens available?

Sunscreens are available as lotions, creams, gels, ointments, wax sticks and sprays. Some sunscreens have combination of moisturizers and cosmetics. For dry skin and for the facial area, cream based sunscreens are best. For hairy areas (scalp or male chest) gels are preferred. Sticks are good for areas around the eyes. In children, sprays are preferred as they are easy to use.

## 10. Which sunscreen should be used?

Points to be considered while choosing sunscreen

- ▶ Broad-spectrum UVA and UVB protection
- ▶ SPF of 30 or more
- ▶ Resistant to water
- ▶ Suitable for one's skin type and activity
- ▶ Easy to reapply
- ▶ If the skin is sensitive and has reacted to sunscreen, fragrance-free product should be used. If sunscreen residue is undesirable, a gel should be chosen.

## 11. Is a sunscreen with higher SPF better than sunscreen with a lower SPF?

SPF 30 is recommended, which blocks 97 % of UVB rays, especially if spending several hours in strong sunshine. Sunscreens with higher SPF block UVB rays to a slightly more extent, but blocking of 100 % of UVB rays is not possible with any sunscreen. Lasting capacity is almost same with sunscreens of high and low SPF.

## 12. How to test for allergenicity of sunscreens?

If there is a concern regarding development of reaction to sunscreen, one should do usage test before using a new sunscreen. The tests consists of applying a small amount of sunscreen on a small area on the inner aspect of forearm for a few days to check if skin develops reaction to the sunscreen. This test indicates the sensitivity of skin to a component of the sunscreen. But it may not always point to an allergy which occurs after repeated use. Sunscreen use should be stopped immediately if unusual reaction occurs and medical attention should be sought.

## 13. How to apply sunscreen?

Usually around 25-50 percent of the recommended amount of sunscreen is applied. Tips for proper application of sunscreens are

- ▶ The amount of sunscreen to be applied should be generous. A teaspoon of sunscreen i.e. 5 ml should be applied to each hand, each leg, front and back of the body and one teaspoon to the face and neck. For an adult around 35 ml is required for one full body application.
- ▶ Chemical sunscreens should be applied 30 minutes before going out to allow the sunscreen ingredients to fully bind to the skin. Physical sunscreens can be applied just before sun exposure as their effect starts immediately.
- ▶ Reapplication of sunscreens should be every two to three hours while outdoors, and also after excessive sweating or swimming.
- ▶ Should not be rubbed into the skin but spread uniformly and allowed to dry.
- ▶ Should be applied to all skin not covered by clothing. Areas like face, ears, neck, top of feet should be included. For hard to reach areas like back, help should be taken or spray sunscreen should be used. In case of thinning hair, sunscreen should be applied on scalp.
- ▶ A lip balm or lipstick containing sunscreen with SPF of 15 or higher may be used for protection of lips.
- ▶ Should not be inhaled or applied near heat, open flame or while smoking.
- ▶ Spray sunscreens should never be applied directly to the face.