

# Consensus statement

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## Sun protection and sunscreens

**Purpose:** to provide recommendations on sun protection and the safe and effective use of sunscreens

**Audience:** Community

**Acknowledgement:** Information in this statement has been adapted from The Australasian College of Dermatologists' *A to Z of Skin: Sun Protection and Sunscreens* by Dr Pascale Guitera FACD. Additional sources, including Cancer Council Australia position statements reviewed and endorsed by The Australasian College of Dermatologists, are indicated.

**Endorsement:** This position statement has been approved by The Australasian College of Dermatologists Board of Directors.

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## Purpose

The Australasian College of Dermatologists is the sole medical college accredited by the Australian Medical Council for the training and continuing professional development of medical practitioners in the speciality of dermatology. As the national peak membership organisation, we represent over 550 dermatologist Fellows (FACD) and 100 trainees.

As the leading authority in Australia for dermatology, we provide information, advocacy and advice to patients, communities, government and other stakeholders on skin health and dermatological practice. Our vision is for the highest standard of skin health and dermatology care to be available and accessible to all patients and communities.

The purpose of this position statement is to:

- Provide guidance to the community on sun protection and its benefits in reducing the risk of skin cancer and premature aging; and
- Inform the community about sunscreens, how they work and how to use them safely and effectively to reduce skin cancer risk.

## Key points

- The goal of sun protection is to prevent the skin from being exposed to excessive ultraviolet (UV) radiation.
- Over a lifetime, the effect of excessive UV exposure accumulates, contributing to ageing of the skin and increasing the risk of skin cancer. Two types of UV radiation - UVA and UVB - both play a role in premature aging and can damage the skin's DNA, leading to precancerous and cancerous changes.
- For effective sun protection of the skin and eyes, a combination of measures are recommended – **slip** on clothing; **slop** on sunscreen; **slap** on a broad-brimmed hat; **seek** shade and **slide** on sunglasses.
- It is also recommended to avoid being outside in the sun in the middle of the day when UV levels are at their highest. It is UV radiation – not the heat from the sun – that leads to DNA damage.
- Sunscreens reduce the effect of UV radiation on the skin by reducing the amount of UV that reaches skin cells. Different ingredients in sunscreens act to reflect light away from the skin (*reflectant or physical sunscreen*) or absorb UV to stop it penetrating the skin (*absorbent or chemical sunscreen*). Many sunscreen products contain both types of ingredients.
- SPF stands for Sun Protection Factor. It indicates the amount of UVB radiation that can reach the skin with sunscreen, compared with no sunscreen. As SPF is the measurement of protection against UVB only, using a broad-spectrum sunscreen – one that protects against both UVA and UVB – is recommended.
- You should use the highest SPF available. While the difference in UV protection between SPF 30 and SPF 50 in laboratory conditions is small, sunscreens with higher SPF have been shown in real world settings to be more resistant to wearing off due to factors such as sweating, wiping off with towels, and not applying sunscreen thickly enough.
- SPF should not be used as a guide for how long you can stay in the sun before you get sunburnt.
- No sunscreen will block 100% of UV radiation. Sunscreens should be used in conjunction with physical protection and should not be seen as a substitute for shade, hats, sunglasses, and protective clothing.
- How effective a sunscreen is depends on how well it is applied and most people do not apply enough. To use sunscreen effectively, apply liberally – at least one teaspoon (5mL) to each body part – at least 20 minutes before going outdoors. It is important not to miss ears, hands, feet and the back of the neck. Reapply every two hours and use a water-resistant sunscreen when swimming and exercising.
- Avoid using aerosol sunscreen products, however if it is your preference, exercise great caution. It is extremely difficult to know how much to apply and to apply correctly to get a good level of UV protection.
- Sunscreens undergo extensive testing before they are approved to go on the market. Sometimes, side effects can occur, such as skin irritation or allergic reactions. These are most commonly a reaction to a chemical in the product (such as fragrance or preservative) rather than the active sunscreen ingredient itself. There is no evidence to support concerns about the safety of sunscreens, including physical “nano-particle” ingredients such as zinc oxide and titanium dioxide.

- For babies less than 6 months of age, the widespread regular use of *chemical* sunscreens is not recommended as they absorb more of any chemical applied to the skin than adults. Sun protection is best provided with shade, clothing, hats and *physical* sunscreen and by avoiding prolonged outdoor exposure during the middle of the day.
- Generally, sunscreen use should not put people at risk of vitamin D deficiency. In summer in Australia, when the UV index is commonly 3 or above, most adults produce sufficient vitamin D as a result of normal outdoor activity. Even for people with a diagnosed vitamin D deficiency, exposure without sun protection when the UV Index is 3 or above is not recommended.



## ACD Position Statement - Sun protection and sunscreens

### What is sun protection?

Sun protection is aimed at reducing excessive exposure to ultraviolet radiation (UV). Effective sun protection allows for healthy growth and development as well as enjoyment of outdoor activities, but aims to reduce risk of skin diseases related to overexposure to sunlight.

Effective sun protection includes a combination of the following measures:

- Physical protection
  - **slip** on clothing, such as tightly woven longer sleeved clothing, and rash vests and wetsuits when swimming or undertaking other water activities
  - **slop** on sunscreen
  - **slap** on a broad-brimmed hat
  - **seek** shade
  - **slide** on sunglasses, preferably close-fitting, wrap-around style
- Avoiding sun exposure during the middle of the day when UV radiation levels are at their highest.

For infants, sun protection is best provided with shade, clothing and hats and by avoiding prolonged outdoor exposure during the middle of the day.

### Why is sun protection important?

Australia has a very high incidence of melanoma and non-melanoma skin cancers (basal cell carcinoma and squamous cell carcinoma). This is predominantly due to the high levels of everyday UV exposure and a proportion of the population with a European background, making sun protection important.

Risk factors for skin cancer include fair complexion, increased number of common moles or unusual moles, weakened immune system or a personal or family history of skin cancer.

Sun protection is also important as UV exposure over time accumulates to produce premature ageing changes in the skin of all ethnic groups.

### What is ultraviolet radiation?

UV radiation is energy produced by the sun and can damage DNA in cells, leading to cancer. It is divided into 3 types according to its wavelength – UVA, UVB and UVC.

- UVC is the most dangerous but is screened out from reaching the earth's surface by the ozone layer.
- UVB is more energetic, is blocked by window glass and is the main cause of sunburn.
- UVA is less energetic but penetrates more deeply into the skin. UVA is not blocked by window glass.

Both UVA and UVB radiation contribute to:

- Precancerous changes (sun spots, actinic keratoses) in the skin
- Cancerous changes (basal cell carcinoma and squamous cell carcinoma skin cancers and melanoma) in the skin
- Ageing effects on the skin such as skin dryness, pigmentation, fine lines, wrinkling and loss of elasticity (photoaging).

UV levels cannot be estimated by the temperature or the amount of cloud cover. It is recommended to check the daily UV Index at <http://www.myuv.com.au/> or the Bureau of Meteorology at <http://www.bom.gov.au/>.

## ACD Position Statement - Sun protection and sunscreens

### What are sunscreens?

Sunscreens are products (creams, lotions, mists, sprays, gels and lip balms) applied to the skin to reduce the effects of UV radiation. Sunscreens help prevent the development of skin cancer as well as photodamaging and ageing effects of the sun. They also help to prevent the development and symptoms of photo-sensitising disorders such as photoallergies and phototoxicities.

### How do sunscreens work?

Sunscreens work in two ways:

- Blocking or reflecting the UV radiation away from the skin. These are known as **reflectant or physical sunscreens**, such as zinc oxide and titanium dioxide. Reflectant sunscreens may take on a milky-white appearance when applied to the skin.
- Absorbing UV radiation, preventing it from getting into skin cells. These are called **absorbent or chemical sunscreens** and usually containing a mixture of synthetic chemicals, such as cinnamates, dibenzoylmethanes (salicylates) and benzophenones. Absorbent sunscreens are usually invisible when applied to the skin.

Sunscreen ingredients are mixed in different bases to provide the large variety of available products.

Sunscreen bases also contain other chemical additives necessary to ensure stability, adequate mixing, a pleasant feel on the skin, a pleasant odour and adequate anti-microbial activity.

### What does SPF mean?

SPF stands for Sun Protection Factor. It indicates the amount of UVB radiation that can reach the skin with sunscreen compared with no sunscreen.

The SPF level of a sunscreen is determined in scientific laboratory conditions and is highly regulated in Australia to ensure strict labelling and safety for consumers.

As SPF is the measurement of protection against UVB only, sunscreens with the same SPF may not offer the same levels of protection against UVA radiation. Using a broad-spectrum sunscreen – one that protects against both UVA and UVB – is recommended.

You should use the highest SPF available. While the difference in UV protection between SPF 30 and SPF 50 in laboratory conditions is small, sunscreens with higher SPF have been shown in real world settings to be more resistant to wearing off due to factors such as sweating, wiping off with towels, and not applying sunscreen thickly enough.

The SPF level should not be used as a guide for how long you can stay in the sun before you get sunburnt – all sunscreens, even when applied correctly, will still allow some UV to penetrate into the skin.

Sunscreens in Australia are labelled for water resistance – this represents the ability of the sunscreen to remain effective on the skin after repeated or prolonged exposure to water. No sunscreen is “water-proof” and all sunscreens become less effective to some extent after exposure to water.

## ACD Position Statement - Sun protection and sunscreens

### When and how should you apply sunscreens?

People living in Australia and New Zealand should apply sunscreen to the face, head and neck and all parts of the body not covered by clothing on all days when the ultraviolet index is forecast to reach three or greater, irrespective of their anticipated activities. For planned outdoors activities, sunscreen should be used alongside other sun protection measures.

How effective a sunscreen is depends on how well it is applied. Most people do not apply adequate amounts of sunscreen, thereby reducing its effectiveness.

Sunscreens should be applied liberally to the skin at least 20 minutes before going outdoors. This allows the product to be evenly dispersed and absorbed into the superficial layers of the skin. Apply at least 1 teaspoon (5mL) of sunscreen product to each body part (face and neck, each arm, each leg, front of body, back etc. and do not miss ears, hands and feet and the back of the neck). Reapply sunscreen every 2 hours.

Use a water-resistant sunscreen when swimming, exercising or perspiring while outdoors. It is always recommended that sunscreens be reapplied after exposure to water to ensure adequate protection. UV protecting garments such as T-shirts, rash vests and wetsuits offer a better protection than sunscreens.

Avoid aerosol sunscreens in the first instance, however if it is your preference, then exercise great caution. It is extremely difficult to get good levels of UV protection from aerosol sunscreens. The quantity of propellant in aerosol sunscreen dilutes the amount of sunscreen dispensed and increases the amount of product needed to achieve adequate coverage and protection. Spray times per limb to achieve the level of UV protection stated on the products vary considerably between products.

### What are the common side effects of sunscreens?

Synthetic chemicals used in sunscreens have been tested extensively for the risk of side effects. Reactions can occur occasionally as a result of sensitivity or allergy to sunscreen ingredients however there are very few reports of chronic or long-term effects related to regular sunscreen use.

While uncommon reactions can occur at first use, or after a few days or years of using the same product.

Types of reactions include:

- **Irritation and sensitivity:** burning, stinging or redness can occur in certain areas of the skin, such as the face around the eyes, or occasionally on the hairy forearms of men. This is not an allergy to the sunscreen as the effect only occurs in certain areas, whereas it can be used without irritation on other areas of skin. This is the most common sensitivity reaction and is called “irritant contact dermatitis”.
- **Allergy:** A true allergic reaction to a chemical in a sunscreen product can occur but is less common.
  - ‘Allergic contact dermatitis’ is where an itchy, blistering rash develops at sites where the sunscreen is applied and can sometimes spread to other areas of the body.
  - ‘Photocontact dermatitis’, a reaction which may look like severe sunburn or eczema, is usually a result of an allergy and occurs where the product has been applied and exposed to sunlight.

In most cases, allergic reactions are due to exposure to a chemical used in the base such as a perfume or preservative, rather than the active sunscreen ingredients. Physical blockers, such as zinc oxide and titanium dioxide, have not been reported to cause contact allergy.

You can perform your own 'patch test' to check for a reaction to a sunscreen product. Apply a small amount on the inside of your forearm to see if the skin reacts, before applying it to the rest of the body. If irritation or sensitivity occurs, it is recommended that another product is used.

Professional patch testing and assessment by a dermatologist may identify the ingredient in sunscreen that is causing an allergic reaction. If you have a known sunscreen allergy, the best way to avoid a reaction is to not use any product that contains the substances that you are allergic to. A dermatologist is best placed to diagnose a reaction and help determine which ingredients you should avoid.

Some sunscreens can cause acne-like eruptions (pimples, folliculitis) when applied to the skin. Again, this is usually caused by the base ingredients of the sunscreen. For those prone to eruptions, gels, lotions or products labelled "oil-free" or "non-comedogenic" are recommended.

### **Do sunscreens cause cancer?**

To date, there is no scientific evidence to suggest that synthetic sunscreen chemicals cause cancer. A 2016 review of the safety of "nanoparticles" (zinc oxide and titanium dioxide) in sunscreens published by the Australian Government Therapeutic Goods Administration found no evidence of safety concerns. Because skin cancer and melanoma have been linked to UV exposure, the benefit of sun protection is clear.

### **Are sunscreens safe for young babies?**

Because very young babies (less than six months of age) absorb more of any chemical applied to the skin than adults, the widespread regular use of chemical sunscreens is not recommended. Instead, avoiding direct sunlight, protecting with clothing and hats and using a physical sunscreen on exposed areas, is preferred.

### **Can I become deficient in vitamin D if I protect with sunscreen?**

Generally, sunscreen use should not put people at risk of vitamin D deficiency. In summer in Australia, when the UV index is 3 or above, most adults will maintain adequate vitamin D levels during typical day to day outdoor activities. Even for people with a diagnosed vitamin D deficiency, exposure without sun protection when the UV Index is 3 or above is not recommended.

Those who are protecting themselves very well from UV exposure because of past history of skin cancer or melanoma should talk to their doctor about vitamin D deficiency.



## ACD Position Statement – Sun protection and sunscreens

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