

### Why use sunscreen?

Australia has the highest rate of skin cancer in the world mostly due to over exposure to ultraviolet (UV) radiation from the sun. Each year over 440,000 Australians are diagnosed with skin cancer and around 1,900 die from it. UV radiation has been identified by the International Agency for Research on Cancer (IARC) as a known carcinogen.

Used in conjunction with other sun protection measures, sunscreen can reduce skin damage caused by overexposure to UV radiation from the sun.

There is evidence that regular use of sunscreen reduces the risk of sunburn, a key risk factor for skin cancer.

### How sunscreens work

Sunscreens work by filtering out most of the UV radiation from sunlight reaching the skin. Sunscreens contain two main types of active ingredients:

- Chemical absorbers - which bind with the cells in the skin and absorb UV radiation and then release the energy as heat.
- Physical blockers - which reflect or scatter UV radiation. Titanium dioxide and zinc oxide are commonly used physical blockers.

### Ingredients in sunscreen

Many sunscreen products combine a mixture of ingredients to provide a high degree of protection against both types of UV radiation that reach the earth's surface, UVA and UVB. Such sunscreens are labelled 'broad spectrum'.

The active ingredients (and maximum concentrations) permitted in sunscreens are regulated in Australia by the Therapeutic Goods Administration (TGA).

Sunscreens also contain preservatives and various other substances such as moisturisers, water, oils, emulsifiers and fragrances.

### Sunscreen safety and testing

On current evidence the health benefits to be gained from the appropriate use of sunscreen considerably outweigh any potential risk.

In Australia, sunscreens with a sun protection factor (SPF) rating of 4 or above must be listed on the Australian Register of the TGA. Products can only be listed on the register if they are tested in accordance, and comply with, the Australian/New Zealand Standard AS/NZS 2604: 2012 'Sunscreen Products - Evaluation and Classification'. This new Australian Standard establishes SPF 50+ as the new maximum sun protection sunscreen available in Australia. For the majority of people sunscreens can be used without any problems. Some people may experience short-term skin irritation, stinging or development of a rash. Occasionally people become allergic to one or more of the components of sunscreen. If you react to one sunscreen, try another with different ingredients (such as a sensitive skin formulation).

### Nanoparticles in sunscreen

Two common ingredients in sunscreen, zinc oxide and titanium dioxide, give the skin a white appearance upon application. In order to reduce the visibility of sunscreens, nanoparticles (micro-fine particles) of these substances are sometimes used.

In 2009 the TGA conducted an updated review of the scientific literature available on the use of nanoparticles in sunscreens, in particular zinc oxide and titanium dioxide. The TGA review concluded that:

- The potential for titanium oxide and zinc oxide nanoparticles in sunscreens to cause adverse effects depends primarily upon the ability of the nanoparticles to reach viable skin cells, and
- To date, the current weight of evidence suggests that titanium dioxide and zinc oxide nanoparticles do not reach viable skin cells; rather, they remain on the surface of the skin and in the outer layer of the skin that is composed of non-viable cells.

The current weight of evidence suggests that nano-materials such as titanium dioxide or zinc oxide nanoparticles currently used in cosmetic preparations or sunscreens pose no risk to human skin or human health.

## Sun Protection Factor (SPF) ratings

It is important to note that sunscreens do not filter 100% of UV radiation. All sunscreens will let some UV radiation through at varying rates indicated by the sun protection factor (SPF) number.

The SPF number is a guide to the protection a sunscreen provides against UV radiation. In simple terms, the higher the SPF the more protection offered. Following strict laboratory testing a sunscreen is given an SPF number (between 4 and 50+ in Australia). The SPF number represents the fraction of the total UV that gets through the sunscreen. So an SPF of 50 allows 1/50<sup>th</sup> or 2% of the ambient UV radiation to pass through to your skin. This compares to an SPF of 30 allowing 1/30<sup>th</sup> or 3.3% of the ambient UV radiation through to your skin.

It is also important to note that most people do not apply enough sunscreen to achieve the level of protection provided by the SPF factor label on sunscreens.

## Choosing a sunscreen

For the best protection choose a sunscreen that:

- Has a sun protection factor (SPF) of 30 or higher.
- Is 'broad-spectrum' meaning it will filter both UVA and UVB radiation.
- Is water-resistant, and therefore less likely to be removed by sweating, swimming or other water-based activities.
- Is labelled 'AS/NZS 2604:2012' signifying that it has been tested to the Australian Standard.
- Has a valid expiry date.

The new Australian Standard on sunscreens specifies that misleading terms such as "waterproof", "sunblock" and "sweat proof" no longer appear on sunscreens.

There are many different types of sunscreen available including milks, creams, gels, lotions and sprays. Any broad spectrum water resistant sunscreen with an SPF 30 or higher, if applied correctly, will provide good protection.

## Recommended use of sunscreen

Sunscreen is recommended as a means of reducing the risk of skin damage from UV radiation when exposure to the sun is unavoidable.

Sunscreens should not be relied upon as the sole form of protecting the skin, but rather used in conjunction with other methods of sun protection including limiting time in the sun when UV radiation is most intense, seeking shade, and wearing sun protective clothing, hats and sunglasses.

Apply sunscreen to clean, dry skin 20 minutes before going out in the sun so that the sunscreen has time to adhere to the skin. For maximum protection apply sunscreen generously to the skin and layer it on, don't rub in. Sunscreen should be reapplied every two hours.

## Sunscreen and babies/children

Use clothing rather than sunscreen to cover most of your child's skin, and then apply sunscreen to the small areas of exposed skin.

There is no evidence that using sunscreen on infants is harmful although some infants can develop minor skin irritations. If using sunscreen on infants it is advisable to do a patch test by applying sunscreen to a tiny area of skin first to check for any possible reaction.

Look for sunscreen formulations for sensitive skin (usually containing titanium dioxide or zinc oxide).

## More information

More information on sun protection is available from the Cancer Council Helpline on 13 11 20 or visit [www.cancerwa.asn.au](http://www.cancerwa.asn.au).

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