



Using Sunscreen Safely

- Ultraviolet radiation (UVR) from the sun causes skin damage. Sunscreen is an important sun protection measure but it should not be used as the first or only form of sun protection. Sunscreen should always be used with the other sun protection measures: wearing tightly woven clothing that covers the arms, legs and body; a broad-brimmed, legionnaire or bucket style hat; sunglasses; and staying in the shade whenever possible.¹
- Sunscreen should be used to decrease exposure to UVR, not to increase the amount of time spent in the sun.
- The Cancer Society recommends the use of broad spectrum, SPF30+ sunscreen. Use water resistant sunscreen if in the water.

Does sunscreen prevent skin cancer?

There are three main types of skin cancer: melanoma (the potentially most dangerous form); squamous cell carcinoma (SCC), which often grows slowly, but if not treated can spread; and basal cell carcinoma (BCC), which is usually curable. Solar keratoses are rough, scaly spots that develop on skin that has had a lot of sun exposure. People with solar keratoses have an increased risk of skin cancer.²

When used correctly, sunscreen can protect against sunburn and DNA damage to skin from UVR exposure.³ Sunburn, especially in childhood is a risk factor for melanoma.⁴ Preventing sunburn may help reduce melanoma risk and skin damage.¹⁰ There is evidence that regular sunscreen use may protect against SCC.⁵ The information is less clear about the extent to which sunscreen prevents melanoma and BCC.⁶ Regular sunscreen users have shown a reduction in development of solar keratoses. Naevi (a type of mole), which frequently develop during childhood, increase the risk of melanoma. It has been shown that regular use of sunscreen in childhood can reduce the development of naevi.⁷

How does sunscreen work?

Sunscreens contain either chemical blockers that absorb UV radiation, dispersing it as heat before it can damage the cells; or physical blockers that reflect UV radiation away from the skin. Some sunscreens contain both.

What does sun protection factor (SPF) mean?

The sun protection factor (SPF) number is a ranking system that shows how much protection is being offered against UVR. The higher the SPF number, the more UVR is filtered out and the greater the protection. SPF gives a general guide to sun protection but does not determine how long it will take for a person to be sunburnt. The amount of time it takes to be sunburnt depends on the level of UVR, and varies according to the time of day, the time of year, the weather, and the person's skin colour.

No matter how high the SPF rating, no sunscreen can screen out all UVR. All sunscreens are filters allowing some UVR to pass through to the skin.⁸ The Cancer Society advises that SPF30+ sunscreen is sufficient for sun protection if applied correctly. Higher SPF sunscreens are available, however, they still need to be correctly applied and reapplied regularly.

What does 'broad spectrum' mean?

UVR consists of UVA, UVB and UVC radiation. UVA penetrates deep into the skin, affecting the cells that lie deep under the skin's surface.⁹ UVA causes aging of the skin, and long-term damage.

UVB radiation penetrates the skin's top layer, causing sunburn, and long-term damage. Both UVA and UVB contribute to skin cancer.¹⁰ Broad spectrum sunscreen gives extra protection because it filters out both UVA and UVB rays. UVC radiation is absorbed in the upper atmosphere and does not reach the Earth.¹¹

What does 'water resistance' mean?

A water resistance claim of two hours means the sunscreen should keep its full SPF protection for two hours in the water. However, it is wise to reapply sunscreen after any water sports, sweating or towel drying.³

How much protection does sunscreen give?

The protection a sunscreen offers is affected by its SPF rating, whether it is broad spectrum, how evenly and thickly you apply it, and how long you spend in the sun. The longer the time spent in the sun, the more UVR accumulates, and the greater the potential for burning.

Even if you're not very active, sunscreen tends to rub off gradually, and therefore needs to be reapplied regularly. This applies particularly to children because they are active.

Is sunscreen safe?

To date, there is no scientific evidence showing long-term side effects following regular use of sunscreen.¹²

Short-term side effects may include reactions, such as skin irritation, stinging or a rash. If these side effects occur, try another brand and look for products that are fragrance-free, or labelled as suitable for sensitive skin. Products containing titanium dioxide and zinc oxide may be the most suitable.

Some sunscreens can have a detrimental effect on car and other pre-painted roof and cladding products, so try to avoid contact between the hands and these surfaces.

What are nanoparticles?

Some sunscreens contain nanoparticles, which are very small particles invisible to the human eye. Recently, there have been questions raised about the safety of sunscreens that contain nanoparticles. To date, the best available evidence suggests that nanoparticles used in sunscreens are not a health risk, because they remain on the surface of the skin and do not pass through to living skin cells.¹³ New research that considers the safety of nanoparticles will be examined as it becomes available.

Applying sunscreen

Apply sunscreen 15 minutes before sun exposure to allow time for it to dry and be absorbed into the skin.

Use a generous amount of sunscreen. The average sized adult should apply at least ½ teaspoon to each arm, and to the face (including the ears and neck); and at least a teaspoon to each leg, the front of body, and the back of body. That is, 35 ml of sunscreen for one full body application.¹⁴

The protective effect of sunscreen depends on correct application. People frequently only receive about 30 percent of the SPF protection level because they do not apply enough sunscreen.¹⁵ No matter what the sunscreen directions say, always reapply sunscreen every two hours when you are outdoors. Sunscreen can be easily wiped or perspired off, and you need to keep applying sunscreen to get the best protection.

How long can you keep sunscreen?

Most sunscreens last about two or three years and should be stored below 30°C. Check the expiry date, and storage conditions on the label. If sunscreen is left in excessive heat (e.g. in the sun, or glove box of a hot car), over time the sunscreen may deteriorate faster and may not give as much protection.

Choosing a sunscreen

- Choose a broad spectrum, SPF30+, water-resistant sunscreen.
- Sunscreen can be bought as a cream, lotion, milk or gel. Choose the one that best suits your skin type and activity.
- If you do not want sunscreen residue left on your hands, a gel may work best for you. Price is not always an indication of quality.
- If using sunscreen on a baby or toddler's skin test it on a small area of their skin first and leave for 24 hours to check for a reaction. Stop use immediately if there is a reaction.

The Ultraviolet Index (UVI)

The Ultraviolet Index (UVI) is an international, scientific measure of the level of UVR in the environment. The higher the number the greater the risk of skin damage.

The Cancer Society advises **sun protection between September and April (especially between 10am and 4pm)**, or when the UVI is 3 or higher.

Check out the Sun Protection Alert on the Met Service website: www.metservice.com or in the weather section of your daily newspaper. The Sun Protection Alert includes local real time advice.

You are welcome to print and distribute this information sheet!

References

- Vainio, H., Miller, A. B., & Bianchini, F. (2000). An international evaluation of the cancer-preventive potential of sunscreens. *International Journal of Cancer*, 88(5), 838-842. doi:10.1002/10970215(20001201)88:5<838:aid-ijc25>3.0.co;2-x
- Thompson, S. C., Jolley, D., & Marks, R. (1993). Reduction of solar keratoses by regular sunscreen use. *New England Journal of Medicine*, 329(16), 1147-1151. doi:10.1056/NEJM199310143291602
- Lautenschlager, S., Wulf, H. C., & Pittelkow, M. R. (2007). Photoprotection. *Lancet*, 370(9586), 528-537. doi: S0140-6736(07)60638-2 [pii]10.1016/S0140-6736(07)60638-2
- Oliveria, S. A., Saraiya, M., Geller, A. C., Heneghan, M. K., & Jorgensen, C. (2006). Sun exposure and risk of melanoma. *Archives of Diseases in Childhood*, 91(2), 131-138. doi: adc.2005.086918 [pii]10.1136/adc.2005.086918
- van der Pols, J. C., Williams, G. M., Pandeya, N., Logan, V., & Green, A. C. (2006). Prolonged prevention of squamous cell carcinoma of the skin by regular sunscreen use. *Cancer Epidemiology, Biomarkers & Prevention*, 15(12), 2546-2548. doi: 1055-9965.EPI-06-0352 [pii]10.1158/1055-9965.EPI-06-0352
- Dennis, L. K., Beane Freeman, L. E., & VanBeek, M. J. (2003). Sunscreen use and the risk for melanoma: a quantitative review. *Annals of International Medicine*, 139(12), 966-978. doi: 139/12/966 [pii]
- Lee, T. K., Rivers, J. K., & Gallagher, R. P. (2005). Site-specific protective effect of broad-spectrum sunscreen on nevus development among white schoolchildren in a randomized trial. *Journal of the American Academy of Dermatology*, 52(5), 786-792. doi: DOI: 10.1016/j.jaad.2004.12.009
- Gies, P., Holmes G. The effective use of sunscreens. *Cancer Update in Practice*. Cancer Society of New Zealand. January 2003.
- Bens, G. (2008). Sunscreen. In J. Reichrath (Ed.), *Sunlight, Vitamin D and Skin Cancer* (Vol. 624). Austin, Texas: Landes Bioscience.
- Armstrong, B.K. (2004). How sun exposure causes skin cancer: an epidemiological perspective. In D. Hill, J. M. Elwood & D. R. English (Eds.), *Prevention of Skin Cancer*. (Vol. 3, pp.89-116). Dordrecht: Kluwer Academic Publishers.
- Gies, P., Roy, C., & Udelhofen, P. (2004). Solar and ultraviolet radiation. In D. Hill, J. M. Elwood & D. R. English (Eds.), *Prevention of Skin Cancer*. (Vol. 3, pp 21-54). Dordrecht: Kluwer Academic Publishers.
- Department of Health and Ageing. Therapeutic Goods Administration. (December, 2001). *Potential oestrogenicity of sunscreens*, from <http://www.tga.gov.au/alerts/medicines/oestrogenicity.htm>
- Department of Health and Ageing. Therapeutic Goods Administration. (February, 2010). TGA fact sheet: *Sunscreens*, from <http://www.tga.gov.au/npm/meds/sunscreen-zotd.htm>
- Schneider. J. (2002). The teaspoon rule of applying sunscreen. *Archives of Dermatology*, 138(6): 838-9. doi: 10.1001/archderm.138.6.838-b
- Diffey, B. (2009). Sunscreens: expectation and realization. *Photodermatology, Photoimmunology & Photomedicine*, 25(5), 233-236. doi: 10.1111/j.1600-0781.2009.00459.x