Sunglasses

To protect eyes from ultraviolet (UV) radiation, Cancer Council Victoria recommends sunglasses that are:

- **close-fitting**
- **wrap-around and cover as much of the eye area as possible**
- **meet Australian Standard AS1067:2003 for sunglasses (lens categories 2, 3 or 4)**
- **marked eye protection factor (EPF) 9 or 10, or labeled UV 400.**

SunSmart recommends protecting the eyes from UV at all times when outdoors during daylight hours, not just during the daily sun protection times.

During the daily sun protection times (when the UV level is 3 and above), in addition to eye protection it is recommended to use a combination of sun-protective measures including:

- **clothing**
- **SPF30 or higher broad-spectrum, water-resistant sunscreen, which is reapplied every two hours**
- **a hat that protects your face, head, neck and ears**
- **seek shade.**

UV levels are most intense during the middle of the day. Check SunSmart UV Alert for daily sun protection times, available:

- **as a free SunSmart app**
- **online at sunsmart.com.au or bom.gov.au/weather/uv**
- **in the weather section of newspapers**
- **as a free website widget.**

The sun protection times are shown when the UV level forecast is 3 and above.

How does UV radiation affect the eyes?

Too much UV radiation to the eyes can cause short-term complaints:

- mild irritation
- acute photo keratopathy, also called snow blindness (like sunburn of the cornea)
- inflammation
- excessive blinking
- photophobia/difficulty looking at strong light.

Exposure to UV radiation over long periods can lead to permanent damage to the eyes such as:

- squamous cell cancers on the conjunctiva (membrane covering the white part of the eye)[1-3]
- skin cancer around the eyes and eyelids[4,5]
- some ocular melanomas (however, not all studies are consistent with this finding) [6-8]
- cataracts (cloudiness of the lens)[9]
- macular degeneration (damage to the retina)[9,10]
- pterygium (pronounced tur-rig-i-um), an overgrowth of the conjunctiva on to the cornea[11]
- climatic droplet keratopathy, or cloudiness of the cornea.[12]

How can I reduce UV radiation exposure to my eyes?

SunSmart recommends wearing sunglasses that meet the Australia Standard to protect the eyes from UV at all times when outdoors during daylight hours. Wearing a broad-brimmed hat can also help reduce UV radiation to the eyes by 50 per cent during the daily sun protection times.[13]

What to look for in sunglasses

The Australian Standard measures how much UV radiation goes through the lens, and defines lens width and height measurements for effective eye protection. The use of large, wrap-around, close-fitting sunglasses helps to reduce reflected UV radiation and glare, which passes around the edge of the sunglasses and reaches the eyes.

Sunglasses should be labelled at least eye protection factor (EPF) 9 or 10, which exceed the requirements of the Australian Standard and may provide even greater protection.[14]

The colour or darkness of the lens does not indicate the level of UV protection; you still need to check the label. However, to reduce sun glare darker-tinted or polarised lenses may be required.

UV-blocking contact lenses can reduce UV exposure, blocking 90 per cent of UVA.[15] Some prescription glasses may provide protection from UV radiation. As with sunglasses, tinted or photochromatic (transition) lenses reduce glare but do not necessarily offer a higher level of UV protection.

Sunglasses

Children and sunglasses

Since eye damage from UV radiation builds over time, it is important to protect the eyes of children, which are particularly sensitive to UV radiation.[16] Sunglasses designed for babies and toddlers have soft elastic to keep them in place. It is important to choose a style that stays on securely so that the arms don't become a safety hazard. Some young children may be reluctant to wear sunglasses. You can still help protect a child's eyes by ensuring they wear a broad-brimmed hat and staying in the shade.

Toy sunglasses do not meet the requirements under the Australian Standard and should not be used for sun protection.[17]

Eye protection for outdoor workers

Some outdoor workers need protection from flying particles, dust, splashing materials and harmful gases. Tinted eye protectors that meet the Australian Standard AS/NZS 1337.1:2010 (Eye and face protectors for occupational applications) provide sun protection, and reduce glare outside. Untinted eye protectors marked 'O' also have sufficient UV protection for outdoor use.

Eye protection in solariums

In Victoria, current regulations state that customers using solariums must wear goggles. If the eyes are exposed to UVA radiation from a solarium, the cornea and the conjunctiva may be briefly inflamed, and sight can sometimes be permanently damaged. UV radiation emitted by solariums has been linked to some ocular melanomas.[6] Solariums will be banned in Victoria from 1 January 2015.

Eye protection in sport

You can buy sunglasses designed to suit specific sports, including golf, cycling, cricket and sailing. Swimming goggles with EPF10 are available.

Further information and resources

Being SunSmart in Victoria information sheet is available from sunsmart.com.au.

UV-protective clothing and accessories can be purchased at Cancer Council Victoria's shop or online at cancervic.org.au/store.

Speak to an optometrist, ophthalmologist or doctor about how to protect your eyes from UV radiation. For more tips on saving your sight, visit vision2020australia.org.au.

References

1. Sun EC, Fears TR, Goedert JJ. Epidemiology of squamous cell conjunctival cancer. Cancer Epidemiology Biomarkers & Prevention 1997; 6(2): 73–7.
2. Ng J, Coroneo MT, Wakefield D, et al. Ultraviolet radiation and the role of matrix metalloproteinases in the pathogenesis of ocular surface squamous neoplasia. Investigative ophthalmology & visual science 2008; 49(12): 5295–306.
3. Tucker MA, Shields JA, Hartge P, et al. Sunlight exposure as risk factor for intraocular malignant melanoma. N Engl J Med 1985; 313(13): 789–92.
4. Armstrong BK. How sun exposure causes skin cancer: An epidemiological perspective. In: Hill D, Elwood JM, English DR, editors. Prevention of Skin Cancer. Dordrecht, The Netherlands: Kluwer Academic Publishers; 2004. 89–116.
5. Lindgren G, Diffey BL, Larkö O. Basal cell carcinoma of the eyelids and solar ultraviolet radiation exposure. British journal of ophthalmology 1998; 82(12): 1412–15.
6. Vajdic CM, Kricker A, Giblin M, et al. Artificial ultraviolet radiation and ocular melanoma in Australia. Int J Cancer 2004; 112(5): 896–900.
7. Vajdic CM, Kricker A, Giblin M, et al. Sun exposure predicts risk of ocular melanoma in Australia. Int J Cancer 2002; 101(2): 175–82.
8. Pane AR, Hirst LW. Ultraviolet light exposure as a risk factor for ocular melanoma in Queensland, Australia. Neuro-Ophthalmology 2000; 7(3): 159–67.
9. Roberts JE. Ultraviolet radiation as a risk factor for cataract and macular degeneration. Eye & Contact Lens 2011; 37(4): 246–9.
10. Chalam K, Khetpal V, Rusovici R, et al. A review: role of ultraviolet radiation in age-related macular degeneration. Eye & Contact Lens 2011; 37(4): 225–32.
11. Moran D, Hollows F. Pterygium and ultraviolet radiation: a positive correlation. British Journal of Ophthalmology 1984; 68: 343–6.
12. Gray R, Johnson G, Freedman A. Climatic droplet keratopathy. Survey of ophthalmology 1992; 36(4): 241–53.
13. Taylor H. The biological effects of UVB on the eye. Photochem Photobiol 1989; 50(4): 489–92.
14. Gies P, Roy CR, Elliott G. A proposed protection factor for sunglasses. Clinical & Experimental Optometry 1990; 73(6): 184–9.
15. Kwok LS, Kuznetsov VA, Ho A, et al. Prevention of the adverse photic effects of peripheral light-focusing using UV-blocking contact lenses. Investigative ophthalmology & visual science 2003; 44(4): 1501–7.
16. Whiteman DC, Whiteman CA, Green AC. Childhood sun exposure as a risk factor for melanoma: A systematic review of epidemiologic studies. Cancer Causes & Control 2001; 12(1): 69–82.
17. Australian Standard AS 1067:2003 (Sunglasses and Fashion Spectacles).

Updated: October 2014

Cancer Council Victoria

VicHealth