

* Endorsed by the Australasian College of Dermatologists

'Given a demonstrated lack of capacity for effective self-regulation and the serious health risks of solarium use, Australia urgently requires comprehensive government regulation of the solarium industry.'

Recommendations

The Australasian College of Dermatologists, The Cancer Council Australia and its member organisations and the Cancer Society of New Zealand recommend that:

1. The public avoid use of any type of artificial ultraviolet (UV) radiation tanning device (solarium) for cosmetic purposes.
2. The public be informed of the risks associated with solarium use.
3. State and territory governments implement comprehensive legislation governing the operation of solariums that prohibits access for those under 18 years of age, provides for informed client consent, bans unsupervised solarium operations and ensures adequate training of staff.

Background

The desire to acquire a tan for fashion or cosmetic purposes has led to the development of a large solarium industry in Australia and New Zealand. There has been considerable growth in the industry, particularly in the past decade. A 2006 audit shows a 400% increase in the number of solariums advertised in the Yellow Pages business directories for Australia's capital cities since 1996.¹ Solariums may emit much higher concentrations of ultraviolet (UV) radiation than the sun – up to five times as strong as the midday summer sun.²

Solariums emit UVA and UVB radiation, both known causes of skin cancer. In general, solariums predominantly emit UVA, however in recent years, solariums have been manufactured to produce higher levels of UVB to mimic the solar spectrum and higher levels of UV radiation intensity to speed up the tanning process.

Overexposure to ultraviolet radiation from the sun and artificial sources is of considerable public health concern. UV radiation plays an important role in the development of skin cancer, cataracts and other eye conditions, and suppresses the immune system. Cumulative UV radiation also results in premature skin ageing.

Given the health risks associated with the use of solariums, The Cancer Council Australia, the Cancer Society of New Zealand and the Australasian College of

Dermatologists does not recommend the use of artificial UV radiation tanning devices for cosmetic purposes. For the same reason it is not recommended that solariums be used to boost vitamin D levels.

It is recognised however, that while solariums continue to be available to the public, there is a need to reduce the risks associated with their use.

Solarium use and skin cancer, skin ageing and eye damage

No solarium can provide a safe tan.³ Adverse health effects associated with ultraviolet radiation including skin cancer and premature skin ageing have been well documented in international and national reports for many years.^{4,5,6,7} Furthermore, the body of evidence directly linking solarium use to adverse health effects continues to grow.

Skin and eye cancers

Exposure to solariums was first listed as a known human carcinogen linked to malignant melanoma of the skin and eye in the Ninth Report on Carcinogens in 2000⁸.

In 2006 the International Agency for Research on Cancer (IARC) convened an International Working Group that assessed the evidence relating to health effects, both positive and detrimental, of exposure to artificial UV radiation through the use of indoor tanning facilities, in particular whether their use increases the risk of skin cancer.

The findings from this systematic review are summarised below:⁹

- *Increase in melanoma risk associated with use of sunbeds*
A positive association with melanoma risk was found amongst those who had ever used a solarium. People who used sunbeds had a 15% increased risk of melanoma, although there was no consistent evidence for a dose-response relationship. This risk was further increased among those who had first used a solarium before the age of 35 – a significant 75% increased risk.
- *Increase in risk of squamous cell carcinoma of the skin associated with use of sunbeds*
The risk of squamous cell carcinoma is increased among people who have ever used solariums.
- *No conclusive evidence was found in regard to a relationship between basal cell carcinoma and solarium use.*
- *The results suggest detrimental effects from use of solariums on the skin's immune response.*
- *Artificial tanning offers little if any protection against solar damage to the skin from subsequent sun exposure.*

Pre-cancerous lesions

Pre-cancerous actinic keratoses and Bowen's disease (squamous cell carcinoma *in situ*) have also been reported in the sunlight-protected but solarium-exposed skin of fair-skinned users after just two to three years of regular solarium use¹⁰.

Skin ageing

Ultraviolet radiation such as from a solarium causes premature ageing of the skin. This may be evident as increased skin wrinkling, irregular pigmentation and altered skin texture (photoageing)^{11,12,13,14} Photoageing includes wrinkling and loss of skin elasticity. It is generally irreversible without cosmetic surgery.

Eye damage

Acute effects of UV radiation on the eye include photokeratitis (inflammation of the cornea and the iris), and photoconjunctivitis (an inflammation of the conjunctiva, the membrane that lines the inside of the eyelids and white of the eye). Long-term effects of UV radiation exposure of the eye may include the development of cataracts, pterygium (white or creamy opaque growth attached to the cornea), and squamous cell cancer of the conjunctiva.

The Australian Consumer and Competition Commission has issued a finding that all solarium operators have a duty of care to ensure solarium patrons are aware of the risks involved with solarium use.

Users at increased risk

While all solarium users are at risk of adverse health effects, certain people are at increased risk of harm. The current voluntary code of conduct, Australasian Standard AS/NZS 2635:2002¹⁵ sets out (among other guidelines) a number of restrictions designed to protect those at greatest risk.

Fair skinned people

Those who have fair skin which always burns and never tans in the sun (Fitzpatrick type 1 skin), are at increased risk of skin cancer.^{16,17} The Standard states that people with this skin type shall not be allowed to use a solarium.

Youth and adolescents

Epidemiological evidence suggests that UV radiation exposure in the first 18 years of life is important in determining lifelong skin cancer risk.^{18,19,20} The 2002 Standard recommends that those under the age of 15 be banned from using solariums and those aged 15 to 17 use a solarium only with parental consent. Recent findings from the IARC review of a 75% increase in risk for melanoma for people who first used solariums in their teens or twenties suggests a case for strengthening these age restrictions.

Other risk factors

Some cosmetics and prescription medications including anti-depressants, antibiotics, drugs for high blood pressure, some medicines for skin conditions, drugs that suppress the immune system and some anti-inflammatory drugs can photosensitise the skin, increasing its sensitivity to ultraviolet radiation. This can decrease the time it takes for the skin to burn in a solarium.²¹

The Standard recommends that clients be informed of the additional risk to those 'taking certain medications by mouth or applying medications or certain cosmetics to the skin'.

Those who have previously been treated for skin cancer or solar keratoses are also recognised as being at increased risk under the Standard which sets out that 'sun tanning unit exposure is not recommended' for this group.

Regulation

At present the solarium industry in Australia and New Zealand is not regulated.

A voluntary code of conduct (AS/NZS 2635:2002) was developed by Standards Australia/New Zealand in 1983 and revised in 2002 in an attempt to address safety issues associated with solarium use, however uptake of these recommendations seems to be poor. A number of Australian studies^{22,23,24,25} have shown low levels of compliance with the Standard, particularly with those recommendations with the greatest potential for minimising harm (including enforcing age and skin type restrictions, providing consent forms and discussing safety procedures with clients).

The continued growth of the solarium industry, an increase in the number of unsupervised commercial solariums in recent years²¹ and the emergence of significant evidence of adverse health effects linked directly to solarium use highlights the need for a strengthening of protective measures (as per World Health Organisation recommendations²¹), including but not limited to:

- prohibiting use by those under the age of 18;
- prohibiting use of unsupervised units;
- ensuring comprehensive operator training; and
- ensuring fully informed client consent.

Given a demonstrated lack of capacity for effective self-regulation and the serious health risks of solarium use, Australia urgently requires comprehensive government regulation of the solarium industry.

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References

- ¹ The Cancer Council Victoria. *An audit of the increase in sun-tanning centres (solariums) in urban Australia, 1992-2006*. The Cancer Council Victoria, Melbourne, 2006.
- ² Walter, D, Marrett, L, From, L, Hertzman, C, Shannon, H, Roy, P. The association of cutaneous malignant melanoma with the use of sunbeds and sunlamps. *American Journal of Epidemiology*, 131, 2 (1990): 232-243.
- ³ National Health and Medical Research Council (NHMRC) *Suntanning parlours, solaria, home tanning equipment (position statement- revised)*. NHMRC, 2002.
- ⁴ National Radiological Protection Board (NRPB). *Health Effects from Ultraviolet Radiation*. Vol 13, No 1. 2002.
- ⁵ International Agency for Research on Cancer (IARC). *Solar and ultraviolet radiation. Monographs on the Evaluation of the Carcinogenic Risk to Humans*. Volume 55. IARC, Lyon 1992.
- ⁶ World Health Organization (WHO) *Environmental Health Criteria 160: Ultraviolet radiation* WHO, Geneva, 1994.
- ⁷ Scientific Committee on Consumer Products, European Commission Health and Consumer Protection Directorate General. *Opinion on biological effects of ultraviolet radiation relevant to health with particular reference to sunbeds for cosmetic purposes*. European Commission Health and Consumer Protection Directorate General, 2006.
- ⁸ National Toxicology Program, United States Department of Health and Human Services (USDHHS). *Ninth report on carcinogens*. USDHHS, 2002.
- ⁹ The International Agency for Research on Cancer Working Group on artificial ultraviolet (UV) light and skin cancer. The association of sunbeds with cutaneous malignant melanoma and other skin cancers: A systematic review. *International Journal of Cancer*, 120 (2006): 1116-1122.
- ¹⁰ Hawk, J. Sunbeds. *Radiation Protection Dosimetry*, 9, 1-3 (2000): 143-145. Cites Speight EL, Dahl M, Farr P. Actinic Keratoses Induced by Sunbed. *British Medical Journal* 308 (1994): 415.
- ¹¹ Shuttleworth, D. Sunbeds and the pursuit of the year round tan. *British Medical Journal*, 307 (1993): 1508-1509.
- ¹² Hawk, J. Sunbeds. *Radiation Protection Dosimetry*, 9, 1-3 (2000): 143-145.
- ¹³ World Health Organization. *WHO Environmental Health Criteria 160: Ultraviolet Radiation*. WHO, Geneva, 1994.
- ¹⁴ Lavker, RM, Veres, DA, Irwin, CJ, Kaidbey, KH. Cumulative effects from repeated exposures to suberythemal doses of UVB and UVA in human skin. *Journal of the American Academy of Dermatology* 32, 53 (1995).
- ¹⁵ Standards Australia International/Standards New Zealand. *AS/NZ 2635,2002: Solaria for cosmetic purposes*. Standards Australia International Limited, Sydney and Standards New Zealand, Wellington, 2002.
- ¹⁶ McGinley, J, Martin, C, Mackie, R. Sunbeds in current use in Scotland: a survey of their output and patterns of use. *British Journal of Dermatology*, 139 (1998): 428-438.
- ¹⁷ Shuttleworth, D. Sunbeds and the pursuit of the year round tan. *British Medical Journal*, 307 (1993): 1508-1509.
- ¹⁸ Whiteman, DC, Whiteman, CA, Green, AC. Childhood exposure as a risk factor for melanoma: a systematic review of epidemiological studies. *Cancer Causes Control*, 12, 1 (2001): 69-82.
- ¹⁹ Armstrong, BK, Kricger, A. The epidemiology of UV induced skin cancer. *Journal of Photochemistry and Photobiology B: Biology* 63 (2001): 8-18.

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- ²⁰ Marks, R, Jolley, D, Leetsas, S, Foley, P. The role of childhood exposure to sunlight in the development of solar keratoses and non-melanocytic skin cancer. *Medical Journal of Australia*, 152 (1990): 62-66.
- ²¹ World Health Organisation. *Artificial tanning sunbeds – risks and guidance*. WHO, Geneva, 2003.
- ²² Dobbinson, SJ, Sambell, NL, Wakefield, MA. Access to commercial indoor tanning facilities by adults with highly sensitive skin and by under-age youth: compliance tests at solarium centres in Melbourne, Australia. *European Journal of Cancer Prevention*, 15 (2006): 424-430.
- ²³ Paul, CL, Stacey, F, Girgis, A, Brozek I, Baird, H, Hughes, J. Solaria compliance in an unregulated environment: The Australian experience. *European Journal of Cancer*, 41 (2005): 1178-1184.
- ²⁴ Lawler, SP, Kvaskoff, M, DiSipio, T, Whiteman, D, Eakin, E, Aitken, J, Fritschi L. Solaria use in Queensland, Australia. *Australian and New Zealand Journal of Public Health*, 30, 5 (2006) 479-482.
- ²⁵ Department of Health Environmental Health Directorate. A Survey of the Solaria Industry. Department of Health WA, 2006.