

Sun Beds

IARC Press Release No 171 29th November 2006

Sunbed use in youth unequivocally associated with skin cancer

The International Agency for Research on Cancer (IARC) is part of the World Health Organization.

The IARC review in 1992 concluded that UV radiation classified as A,B or C were all three probably carcinogenic.

UV-A 400nm-315nm: Often referred to as 'blacklight', this is the longest wavelength region and lowest energy, it represents the largest portion of natural UV light.

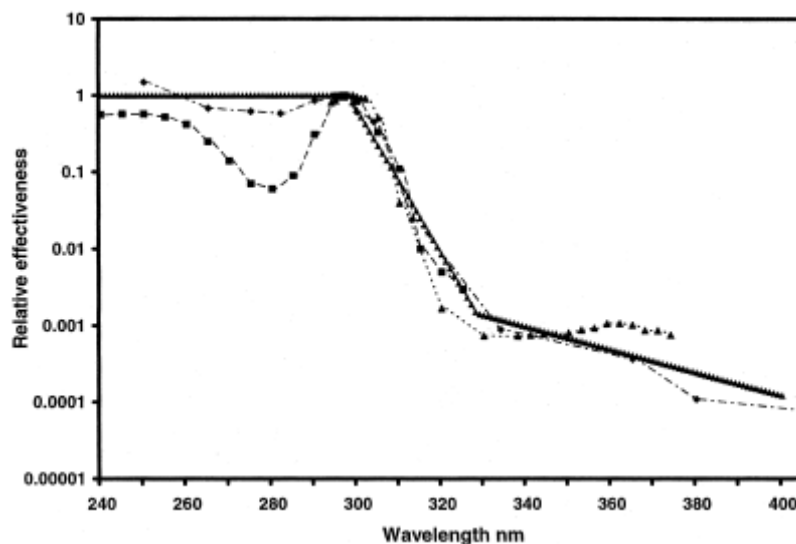
UV-B 315nm-280nm: Partially blocked by the ozone layer this is the most aggressive component of natural UV light and largely responsible for sunburn (erythema).

UV-C 280nm-200nm: Only generally encountered from artificial light sources since it is totally absorbed by the earth's atmosphere. Some sources quote the range as 100nm to 280 nm but this does not account for the fact that below 180 nm UV light is readily absorbed by air.

The International Commission on Non-Ionising Radiation (ICNIRP) established exposure limits: for all UV sources the effective radiant exposure on unprotected skin should not exceed 30Jm^{-2} within an 8 hour period. For UVB and UVC wavelengths (<315nm); the effective radiant exposure on unprotected eyes should not exceed 30Jm^{-2} within an 8 hour period. For UVA wavelengths (400-315nm); the total radiant exposure incident on unprotected eyes should not exceed $10,000\text{Jm}^{-2}$ within an 8 hour period.

Exposure during sun bathing and tanning under artificial sources may well exceed these limits. People with darker skin can be safely exposed to higher levels. The limits were set on the basis of protection against erythema at the eye and were last confirmed in 2004 [*Health Physics* (2004) Vol.87#2 p 171-186].

The action spectra for erythema and for skin cancer are usually considered to be very similar to each other; i.e. exposure sufficient to cause one is sufficient to cause the other:



From [*Health Physics* (2004) Vol.87#2 p 171-186].
The dark line represents the curve used for risk assessment purposes,
the other lines are experimental data.

The graph indicates roughly 100 times potency of UV B over UV A. The parallel between erythema and cancer risk does not necessarily mean that erythema causes skin cancer nor does it necessarily mean that prevention of erythema (e.g. using sun screens) will protect against skin cancer.

The current press release follows a systematic review of the epidemiology literature, which selected 19 studies of note.

Specific findings:

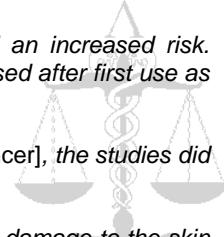
Ever-use of sunbeds was positively associated with melanoma (summary relative risk, 1.15; 95% CI, 1.00-1.31), although there was no consistent evidence of a dose-response relationship.

First exposure to sunbeds before 35 years of age significantly increased the risk of melanoma, based on 7 informative studies (summary relative risk, 1.75; 95% CI, 1.35 - 2.26).

The summary relative risk of 3 studies of squamous cell carcinoma showed an increased risk. Limited data suggest that the risk of squamous cell carcinoma is similarly increased after first use as a teenager.

For basal cell carcinoma [the most common but least aggressive form of skin cancer], the studies did not support an association.

The evidence does not support a protective effect of the use of sunbeds against damage to the skin from subsequent sun exposure, nor does use of indoor tanning facilities grant protection against vitamin D deficiency. Young adults should be discouraged from using indoor tanning equipment and restricted access to sunbeds by minors should be strongly considered.



Comment

The finding that use of sunbeds could lead to increased risk of melanoma and squamous cell carcinoma cancer should come as no surprise.

It is not clear from the report how the likely link between use of a sunbed and sun exposure was corrected for; this will become clear when the full study is published.

If the (RR = 1.75) risk factor is accurate, and does not simply measure an increased propensity to expose to sunlight, it is just below the strength where causation might be assumed, on the balance of probabilities. Detailed assessment of the dose response function would be required to establish a level of exposure where a causal presumption could be made. IARC have little confidence in the data on dose response relationships. If there is a cumulative effect of exposure from several sources, use of sunbeds could be cited as a material contribution.

In our view, the case against sunbeds is not without significant uncertainties. These would be alleviated by evidence of a clear dose-response effect in people taking account of skin types and other sources of exposure as well as exposure to skin sensitizing drugs. Evidence of sunburn attributed to the use of sunbeds and evidence of a lack of significant exposure to solar radiation may be sufficient to overcome many of these doubts in an individual case.

[Intense exposures to UV are experienced by welders. Some low voltage lamps include a quartz envelope and emit significant power in the UV. Often, such unwanted light is filtered to prevent fading of display goods.]
