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artificial tanning sunbeds

risks and guidance



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Preface

Ultraviolet (UV) radiation comes from the sun and other sources. The UV region covers the wavelength range 100–400 nm and is divided into three bands: UVA, UVB, and UVC. All three bands are classified as a probable human carcinogen.

Sunbeds emit UVA and UVB radiation. In general, sunbeds predominantly emit UVA radiation, which is thought to be the least damaging of the UV radiation spectrum. However in recent years, sunbeds have been manufactured that produce higher levels of UVB to mimic the solar spectrum and speed the tanning process.

Overexposure to UV 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.

Between two and three million non-melanoma skin cancers and approximately 132 000 malignant melanomas occur globally each year. One in every three cancers diagnosed worldwide is a skin cancer. In addition, estimates from the World Health Organization (WHO) show that sun exposure may have been a key contributor to the development of cataracts in up to 20% of people who have cataracts.

While WHO does not recommend the use of UV tanning devices for cosmetic purposes, it is recognized that sunbeds continue to be available to the public. For this reason there is a need for guidance to reduce the risks associated with their use.

This practical guide, prepared by Craig Sinclair, WHO, is intended for government health authorities, to assist them in the development of public health policy in relation to sunbeds.

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Artificial Ultraviolet Radiation Devices

The desire to acquire a tan for fashion or cosmetic purposes has led to the development of a large artificial tanning industry in mostly western countries where many residents have pale skins.

Exposure to ultraviolet (UV) radiation causes darkening of the skin's pigment melanin to produce a tan, except for people whose skin does not tan but only burns (skin phototype I: see table below). In principle, a person's reaction to UV radiation (tanning or sunburning) is similar whether the exposure is to natural (solar) or artificial (sunbed) UV radiation ¹.

In 1994 the World Health Organization (WHO) issued a major scientific review ² that stated that there are adverse health effects associated with sunbed use. The findings of this report have been supported since by a number of key authorities including the International Commission on Non-ionizing Radiation Protection ¹, the National Toxicology Program of the Department of Health and Human Services ³, the National Radiological Protection Board (United Kingdom) ⁴, the National Health and Medical Research Council (Australia) ⁵ and EUROSkin ⁶.

In Hamburg 2000, a WHO workshop on sunbeds was held at the inaugural EUROSkin Conference. The outcomes from this workshop are documented in the recommendations contained in this report.

Table 1 Classification of skin types based on their susceptibility to sunburn in sunlight ⁷

SKIN PHOTO TYPE	SUNBURN SUSCEPTIBILITY	TANNING ABILITY	CLASSES OF INDIVIDUALS
I	Always sunburn	No tan	Melano-compromised
II	High	Light tan	
III	Moderate	Medium tan	Melano-competent
IV	Low	Dark tan	
V	Very low	Natural brown skin	Melano-protected
VI	Extremely low	Natural black skin	

Artificial UV radiation devices are used to treat certain medical conditions such as vitamin D deficiency and psoriasis. However, such treatment should only be carried out under medical supervision. For the majority of the population, incidental exposure to the sun, combined with dietary intake of vitamin D, provides adequate vitamin D throughout the year.

The Association of Sunbed Use with Skin Cancer, Skin Ageing and Eye Damage

Adverse health affects associated with sun exposure, such as skin cancer and premature skin ageing, have been well documented in international and national reports ^{4,8,2} and peer reviewed medical journals.

Skin Cancers

There is increasing evidence from both experimental and epidemiological data that cumulative exposure to UV radiation increases the risk of skin cancers. Therefore the added exposure from UV tanning appliances is likely to add to the well known detrimental consequences of natural solar exposure ⁹. There is no evidence to suggest that any type of sunbed is less harmful than natural sun exposure.

Precancerous actinic keratoses and Bowen's disease have also been reported in sunlight-protected but sunbed-exposed skin in fair skinned users after just two to three years of regular sunbed use ¹⁰.

Skin Ageing

Structural damage to human skin from exposure to UV radiation causes, in the short term, burning, fragility and scarring, and in the longer term, photoageing ^{11,12, 2,13}. 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

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