



Strahlenschutzkommission

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Regulations Concerning the Use of Sunbeds

Recommendation of the German Commission on Radiological Protection

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Gesetzliche Regulierung der Nutzung von Solarien
Empfehlung der Strahlenschutzkommission
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In the event of any doubts about the meaning, the German original as published shall prevail.

The Commission on Radiological Protection (SSK) is concerned about the strong increase in skin cancer:

According to extrapolations published by the Cancer Registry of Schleswig-Holstein, up to 140,000 new cases of skin cancer (including approx. 20,000 melanoma *in situ* cases) are observed in Germany every year. 10 to 15% of these cases are malignant melanomas (MM), while the largest part are basal cell carcinomas (BCC) and squamous cell carcinomas (SCC). 20 to 25% of patients with a malignant melanoma die from the disease, which amounts to between 3,000 and 5,000 deaths per year. BCC and SCC lead to death in 0.5 to 1% of the cases. Over the past few years, the peak of occurrence of malignant melanomas has constantly shifted to younger ages.

An ever increasing number of skin cancer incidents was observed in recent years. The incidence rate of malignant melanoma tripled within the last 20 years in Germany. A similar development could be witnessed in white populations all over the world. A large number of epidemiological and experimental *in vitro* and *in vivo* studies show that UV radiation constitutes a “complete” carcinogen since it is involved both in the initiation and in the promotion and progression of this type of cancer. International organisations (NIEHS, IARC) agree in considering UV radiation as carcinogenic [1, 2]. This applies to both solar UV radiation and UV radiation from artificial sources, such as solaria (according to IARC).

On the basis of these data records, international health and radiation protection organisations, such as WHO, ICNIRP, EUROSKIN and the Nordic Radiation Protection and Health Authorities, recommend to ban solarium and/or sunbed use by young people under the age of 18 [3, 4, 5, 6, 7].

The mechanisms of cancer generation do not differ whether they are triggered by natural (solar) or by artificial UV radiation (e.g. solarium use). Changes in people’s recreational and social behaviour since the 1950s have led to an increased UV exposure and are thus held responsible for the continuous increase in skin cancer incidents. The increasing use of solaria over the past 30 years has added to the development described above [8].

The UV-induced vitamin D production provokes biopositive effects of UV radiation. This hormone is essential for maintaining bone stability. Symptomatic vitamin D3 deficiency diseases are not recorded in Germany. In the event that a vitamin D deficiency is diagnosed, however, food (and dietary supplements) provide sufficient compensation.

Although it is suggested that vitamin D might reduce the risk of developing some types of cancer, immune mediated diseases or mental disorders, such as schizophrenia, the application of additional UV irradiation is not justified since the relevant data records are not sufficiently sustainable [9, 15, 16]. In summary, the disadvantages of additional UV radiation prevail by far.

Both the aetiology and the epidemiology of skin cancer suggest that UV exposure in particular during childhood and youth constitutes a considerable risk factor for the

pathogenesis of skin cancer in later life [10, 11, 12, 13 and citations therein]. For the reasons stated above, the Commission on Radiological Protection issued in recent years a number of recommendations and statements with respect to protecting the population from artificial (solarium) and natural UV radiation [14].

In particular the Commission's statements on health risks from UV exposure for children and youths ("*Gesundheitliche Gefährdung durch UV-Exposition von Kindern und Jugendlichen*") [14] and sustainable protection of the population from UV exposure ("*Nachhaltiger Schutz der Bevölkerung vor UV-Strahlung*") [14] underline the risks of solarium use for young people and call for a legal ban on solarium use for young people under the age of 18. The Commission on Radiological Protection expresses its strong concern at the fact that such law has not been introduced yet. Legal regulations in this context are urgently required since serious deficiencies have been found even in certified sun studios. A BfS-initiated inspection of 100 certified sun studios at the end of 2008 came to the conclusion that only 4 of the 100 inspected studios comply with all certification criteria. One of the critical points was the certification of coin-operated sunbeds and youths under the age of 18 were not denied access to sunbeds.

In view of the scientifically established considerable risks of UV radiation and the negative experience made in the past with voluntary certification of sun studios, the Commission on Radiological Protection is of the opinion that a legal regulation is imperative in order to minimise the risk of health effects from UV radiation due to solarium use (in particular skin cancer and especially in the case of young people).

Recommendations

The Commission on Radiological Protection confirms its former recommendations and statements on the risks of natural and artificial UV radiation [14] and recommends furthermore:

1. Prompt introduction of legal regulations with respect to solarium use;
2. On the basis of the negative experience with voluntary certification of sun studios, the SSK recommends that such legal regulations contain the following elements:
 - Prohibition of solarium use for youths under the age of 18;
 - Exclusive employment of sun studio personnel who have successfully completed a special training programme;
 - Formulation of training content (for both personnel and operators) by an independent expert board;
 - Limitation of the irradiation power of UV irradiation machines to $\leq 0.3 \text{ W/m}^2$;

- Preparation of individual exposure plans for sun studio customers (exposure never exceeding 1 MED¹, initial exposure ≤ 0.4 MED);
 - No uncontrolled use (such as coin-operated machines);
 - Labelling of the irradiation machines in use (including indication of the irradiation power);
 - All cosmetics etc. which the customers are offered have to be comprehensibly declared;
 - Implementation of and compliance with the radiation protection criteria set out in the BfS brochure “UV-Fibel” [17];
 - Therapeutic use of UV radiation must be restricted to clinical institutions and medical practices. The SSK underlines that only a physician with the required expert knowledge shall be allowed to prescribe the application of UV radiation on the basis of a benefit-risk assessment.
3. The SSK recommends furthermore that compliance with the legal regulations be monitored frequently and consistently.

For the scientific basis of this recommendation please refer to the most recent SSK statements on this topic [14].

¹ Minimal erythema dose (skin type II) = 200 J/m²

Literature

- [1] 11th Report on Carcinogens (RoC) of National Toxicological Program of the National Institute of Environmental Health Science (NIEHS), 2005 (<http://ntp.niehs.nih.gov>)
- [2] IARC Solar and ultraviolet radiation. International Agency for Research on Cancer. Monographs on the Evaluation on Carcinogenic Risks to Humans, Vol. 55, 1992
- [3] <http://www.who.int/uv/publications/sunbedpubl/en/>
- [4] ICNIRP statement: Health issues of ultraviolet tanning appliances used for cosmetic purposes. *Health Physics* **84**, 119-127 (2003)
- [5] Greinert, R.; McKinlay, A.; Breitbart, E.W.: The European Society of Skin Cancer Prevention - EUROSkin: towards the promotion and harmonization of skin cancer prevention in Europe. Recommendations. *Eur. J. Cancer Prev.* **10**, 157-162 (2001)
- [6] UV-Radiation of Sun beds, Common Public Health Advice from Nordic Radiation Protection and Health Authorities, 2006
http://www.sst.dk/upload/forebyggelse/cff/sol_hudkraeft/nordic_sunbed_position.pdf
- [7] WHO: Fact Sheet No. 287. Sunbeds, tanning and UV exposure (2005)
- [8] IARC: The association of the use of sunbeds with cutaneous malignant melanoma and other skin cancers: A systematic review. *Int J. Cancer* **126**, 1116-1122 (2006)
- [9] Lucas, R.M. et al.: Is the current public health message on UV exposure correct? *Bulletin of the WHO* **84**, 485-491 (2006)
- [10] Gallagher, R.P. et al.: Sunburn, suntan, and pigmentation factors and the frequency of acquired melanocytic nevi in children. Similarities to melanoma: the Vancouver Mole Study. *Arch. Dermatol.* **126**, 770-776 (1990)
- [11] Wicker, T. et al.: Moderate sun exposure and nevus counts in parents are associated with development of melanocytic nevi in childhood: a risk factor study in 1812 kindergarten children. *Cancer* **97**, 628-638 (2003)
- [12] Dulon, M. et al.: Sun exposure and number of nevi in 5- to 6-year old European children. *J. Clin. Epidemiol.* **55**, 1075-1081 (2002)
- [13] Gandini, S. et al.: Meta-Analysis of risk factors for cutaneous melanoma: I. Common and atypical naevi. *Eur. J. Cancer* **41**, 28-44 (2005)
- [14] Strahlenschutzkommission (SSK):
 1. Gesundheitliche Gefährdung durch UV-Exposition von Kindern und Jugendlichen, Stellungnahme der Strahlenschutzkommission, verabschiedet in der 210. Sitzung der SSK am 28./29.09.2006, veröffentlicht in Band 61 der Reihe „Veröffentlichungen der Strahlenschutzkommission“
 2. Schutz des Menschen vor den Gefahren der UV-Strahlung in Solarien, Empfehlung der Strahlenschutzkommission, verabschiedet in der 172. Sitzung der Strahlenschutzkommission am 8. Juni 2001, veröffentlicht im BAnz Nr. 193 vom 16.10.2001 und in Band 48 der Reihe „Veröffentlichungen der Strahlenschutzkommission“

3. Schutz des Menschen vor solarer UV-Strahlung, Empfehlung der Strahlenschutzkommission, verabschiedet in der 144. Sitzung der SSK am 27.02.1997, veröffentlicht im BAnz Nr. 98 vom 03.06.1997 und in Band 41 der Reihe „Veröffentlichungen der Strahlenschutzkommission“
 4. Nachhaltiger Schutz der Bevölkerung vor UV-Strahlung, Empfehlung der Strahlenschutzkommission, verabschiedet in der 217. Sitzung der SSK am 20./21.09.2007, veröffentlicht im BAnz Nr. 12 vom 23.01.2008
 5. Einfluss der natürlichen Strahlenexposition auf die Krebsentstehung in Deutschland, Stellungnahme der Strahlenschutzkommission mit wissenschaftlicher Begründung, Kapitel: „Ultraviolette Strahlung und Hautkrebs“, Veröffentlichungen der Strahlenschutzkommission Band 62 (2008)
www.ssk.de
- [15] UV exposure guidance: A balanced approach between health risks and health benefits of UV and Vitamin D. Proceedings of an International Workshop, International Commission on Non-Ionizing Radiation Protection, Munich, Germany, 17-18 October, 2005.
Prog. Biophys. Mol. Biol. **92**, 1-184 (2006)
- [16] Vitamin D and Cancer, *IARC Working Group Reports*, **vol. 5**, 1-449 (*www.iarc.fr*)
- [17] UV-Fibel, Geprüftes Sonnenstudio-Zertifizierungskriterien des Bundesamtes für Strahlenschutz, herausgegeben vom Bundesamt für Strahlenschutz, 2. überarbeitete Auflage 2007 (*www.bfs.de*)

List of abbreviations:

EUROSKIN	European Society of Skin Cancer Prevention
IARC	International Agency for Research on Cancer
ICNIRP	International Commission on Non-Ionizing Radiation Protection
NIEHS	National Institute of Environmental Health Sciences
WHO	World Health Organization