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## ICNIRP Statement

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### GUIDELINES ON UV RADIATION EXPOSURE LIMITS

International Commission on Non-Ionizing Radiation Protection\*

In 1985 the International Non-Ionizing Radiation Committee of the International Radiation Protection Association (INIRC/IRPA) published guidelines on exposure limits for ultraviolet (UV) radiation. The UV guidelines were amended in 1989, and published in a book of all INIRC/IRPA guidelines in 1991 (INIRC/IRPA 1991).

A thorough review of the recent scientific literature has now been conducted by ICNIRP in collaboration with WHO and UNEP and published as Environmental Health Criteria monograph 160 (UNEP/WHO/ICNIRP 1994). This updated review and health risk assessment of human exposure to UV served as the scientific database for a reassessment by ICNIRP of the 1989 guidelines on UV exposure.

In its review of the whole database, ICNIRP noted that a substantial number of studies have been published since 1989, and that many of the biological effects, where only tentative data were available in 1989, have now been clarified. In particular, the understanding of UVA-induced damage to DNA by indirect mechanisms, the involvement of new mechanisms for cell protection against the harmful effects of photosensitized reactions, and the participation of UVA in the chain of events believed to play a role in melanocytic and non-melanocytic skin cancer. There is further evidence for the importance of childhood irradiation for melanocytic skin cancer. There has been significant improvement in the understanding of the complex chain of events involved in photo carcinogenesis, e.g., the discovery of a UV signature at the molecular level (i.e., the p53 gene mutation) (Mukhtar and Elmetts, 1996). Progress has also been made in the elucidation of several action spectra including those for photo carcinogenesis and erythema.

It was noted, however, that a number of issues still need further research before a more complete health risk assessment can be made. These include the modulation of the immune system by both UVA and UVB and their interaction with several chromophores; the apparent role of UVA in the development of melanocytic skin cancer; and the role of both UVA and UVB in the development of different types of cataract (UNEP/WHO/ICNIRP 1994).

At its annual meeting in Budapest, 27 April–2 May 1996, ICNIRP concluded that, while significant clarification had occurred with respect to health risk assess-

ment from exposure to UV, recent data do not provide any results suggesting that the exposure limit values contained in Table 1 of the 1989 guidelines need to be amended. However, in response to requests for clarification of the application of the values contained in Table 1 of the 1989 Guidelines to exposure of the eye(s) and the skin within an 8-h period, the following applies: Ultraviolet radiant exposure in the spectral region 180 to 400 nm incident upon the unprotected eye(s) should not exceed  $30 \text{ J m}^{-2}$  effective spectrally weighted using the spectral weighting factors contained in Table 1, and the total (unweighted) ultraviolet radiant exposure in the spectral region 315 to 400 nm should not exceed  $10^4 \text{ J m}^{-2}$ . Ultraviolet radiant exposure in the spectral region 180 to 400 nm upon the unprotected skin should not exceed  $30 \text{ J m}^{-2}$  effective spectrally weighted using the spectral weighting factors contained in Table 1. This conclusion is supported by a review conducted by the National Radiological Protection Board (NRPB 1995) and a recent paper (Mariutti 1996). Thus ICNIRP reaffirms the 1989 guidelines on exposure limits to UV radiation (INIRC/IRPA 1991) as valid for current use. ICNIRP will continue to monitor the scientific literature and amend the guidelines on exposure limits as necessary.

Erratum: Line 26 of Table 1 should read correctly:  
 $303^b \quad 250 \quad 25 \quad 0.120$

### REFERENCES

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