Two Reviews from ICNIRP

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The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has released two new reviews on RF radiation: (1) *Exposure to High-Frequency Electromagnetic Fields, Biological Effects and Health Consequences (100 kHz-300 GHz),* and (2) *Epidemiologic Evidence on Mobile Phones and Tumor Risk: A Review*."

The first is a 372-page review that addresses all aspects of RF interactions, from dosimetry to *in vitro* and *in vivo* experiments to epidemiological studies. It was prepared by the full commission and its advisory committees. The full text of the report is available at no charge from the ICNIRP Web site. Here is the conclusion on the plausibility of non-thermal effects:

> Recent concern has been more with exposure to the lower level RF radiation characteristic of mobile phone use. Whilst it is in principle impossible to disprove the possible existence of non-thermal interactions, the plausibility of various non-thermal mechanisms that have been proposed is very low.

and on cancer and genotoxic effects:

> Concerning cancer-related effects, the recent in vitro and animal genotoxicity and carcinogenicity studies are rather consistent overall and indicate that such effects are unlikely at SAR levels up to 4 W/Kg.

The review of the epidemiological studies was written by ICNIRP's standing committee on epidemiology and will appear in the September issue of *Epidemiology.* An advance copy of the paper has been posted on the journal's Web site. In this case, only the abstract is free to those who do not subscribe to *Epidemiology.* Members of the ICNIRP epi group include Anders Ahlbom, Maria Feychting and Tony Swerdlow; all three are working on the Interphone project and have been identified as members of the study team who are skeptical of a cell-phone tumor risk. The three other authors are Australia's Adele Green, Leeka Kheifets, who has

longstanding ties to EPRI, the electric industry research group, and David Savitz, best known to the EMF community for replicating the Wertheimer-Leeper power line-childhood leukemia study in the 1980s. (Note that Ahlbom stepped down from ICNIRP last year and was replaced by Feychting, his former student and now colleague.) The group concludes:

> "In our opinion, overall the studies published to date do not demonstrate a raised risk within approximately 10 years of use for any tumor of the brain or any other head tumor. However, some key methodologic problems remain —for example, selective nonresponse and exposure misclassification. Despite these methodologic shortcomings and the still limited data on long latency and long-term use, the available data do not suggest a causal association between mobile phone use and fast-growing tumors such as malignant glioma in adults, at least those tumors with short induction periods. For slow-growing tumors such as meningioma and acoustic neuroma, as well as for glioma among long-term users, the absence of associations reported thus far is less conclusive because the current observation period is still too short. Currently data are completely lacking on the potential carcinogenic effect of exposures in childhood and adolescence."

The epi paper is accompanied by a commentary in the same issue of *Epidemiology*, but which has not yet been posted by the journal.

ICNIRP, Anders Ahlbom, Maria Feychting, Leeka Kheifets, Anthony Swerdlow, Adele Green, David Savitz, genotoxicity, phones/cancer,

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