THE APPROACH OF ICNIRP TO THE PROTECTION OF CHILDREN

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ICNIRP
The International Commission on Non-Ionizing Radiation:

- develops international guidelines on limiting exposure to non-ionizing radiation that are independent and science based
- provides guidance and advice on the health hazards of non-ionizing radiation
- provides science based guidance and recommendations on protection from non-ionizing radiation exposure
ICNIRP Statement

GENERAL APPROACH TO PROTECTION AGAINST NON-IONIZING RADIATION

www.icnirp.org
ICNIRP Guidelines

GUIDELINES FOR LIMITING EXPOSURE TO TIME-VARYING ELECTRIC, MAGNETIC, AND ELECTROMAGNETIC FIELDS (UP TO 300 GHZ)

www.icnirp.org
Based on established health effects or biological effects relevant for health

Two-level protection system

♦ Basic restrictions
♦ Reference levels
If several effects occur, it may be possible to rank them according to the exposure level at which each effect becomes relevant.

The critical effect is the established adverse health effect that is relevant at the lowest level of exposure.

General Approach to Protection Against Non-Ionizing Radiation (1998)
THE TWO-LEVEL SYSTEM

- Basic restrictions
  in terms of biologically effective quantities
- Reference levels
  in terms of an external exposure metric

Exposure below reference levels ensures compliance with basic restrictions, since the relations between them have been developed under worst-case conditions.

If the reference level is exceeded, the basic restriction is not necessarily exceeded.
Different groups in a population may have differences in their ability to tolerate a particular NIR exposure. For example, children, the elderly, and some chronically ill people might have a lower tolerance for one or more forms of NIR than the rest of the population. Under these circumstances, it may be useful or necessary to develop separate guideline levels for different groups within the general population, but it may be more effective to adjust the guidelines for the general population to include these groups.
ELECTROMAGNETIC FIELDS AND CHILDREN

STEPS IN THE DEVELOPMENT OF GUIDELINES

♦ Analysis of biological/health effects
♦ Identification of the critical effect
♦ Establishment of basic restrictions
♦ Derivation of reference levels

How does the process work in the case of children?
Does any health effect, or any biological effect relevant for health, exist that is specific for children?

If yes, the effect is included in the database for guidelines.
IDENTIFICATION OF THE CRITICAL EFFECT

Does any health effect, or biological effect relevant for health, occur in children at exposure levels lower than adults?

If yes, the effect in children is considered as the critical effect.
Is the threshold for a given effect lower for children than for adults?

If yes, the threshold for children is assumed as the criterion.
Reduction ("safety") factors are introduced in base restrictions to account for uncertainties in the data (e.g. experimental errors, limitations in dosimetry, extrapolation across species, frequencies, ages, etc.).

Such factors provide margins for possible lack of data relative to specific population groups or exposure situations.
Is the dosimetry for children different from adults?

Yes. All the relevant parameters, and all exposure conditions are taken into consideration.
Power density required to produce a whole-body SAR equal to the ICNIRP basic restriction (NRPB 2004)
The collective impact of multiple “conservative” assumptions is to provide a degree of safety or freedom from hazard for a given human (including children) much greater than is implied by the explicit reduction factors.

(Adapted from IEEE std. C95.1, 1999 Edition)
How is ICNIRP expected to deal with progress in scientific knowledge on possible health effects of electromagnetic fields on children?
“If there are currently *unrecognised* adverse health effects from the use of mobile phones.

No science-based action is possible at the moment.
“If there are currently unrecognised adverse health effects from the use of mobile phones, children may be more vulnerable because of their developing nervous system.

Specific health effect? To be identified
“If there are currently unrecognised adverse health effects from the use of mobile phones, children may be more vulnerable because of their developing nervous system, the greater absorption in the tissues of the head.

Is that true? Dosimetry needed.
“If there are currently unrecognised adverse health effects from the use of mobile phones, children may be more vulnerable because of their developing nervous system, the greater absorption in the tissues of the head, and a longer lifetime of exposure.”

Do degenerative effects exist?
SYSTEMS OF PROTECTION

• Health threshold based systems
  Adequate for well established, threshold effects

• Optimization systems
  Adequate for no-threshold known hazards

• Precautionary measures
  Adequate for suspected, not established hazards

(Berqvist 1996)
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(Berqvist 1996)
The role of ICNIRP as a scientific advisory body is to analyse the risks in terms of levels of consequences that can be quantified. The acceptability of such risks is based also on social and economic considerations and fall outside the remit of ICNIRP.

General Approach to Protection Against Non-Ionizing Radiation (1998)
CONCLUSIONS

The protection system using basic restrictions and reference levels makes the ICNIRP guidelines flexible and applicable to virtually any exposure condition, and to any group of the population.

The flexibility of the protection system allows any specificity to be incorporated in a way that is straight, logical, transparent and conservative.

Therefore, there is no need, or justification, for a special approach to the protection of children.
CONCLUSIONS

ICNIRP guidelines are continuously revised and updated on the base of new scientific findings.

The research on health effects of electromagnetic fields on children will be monitored with special attention.

Any advice or recommendation that seems appropriate on the base of scientific data will be timely provided, in the frame of the established protection system.