

# Wireless Communication and Precautionary Principle

By Dariusz Leszczynski, PhD, DSc

**W**e, the cellphone users, are seriously misled. When buying a cellphone, we assume this radiation-emitting product has been tested for human health safety before it was put on the market. We assume cellphones are safe to use. But this might be a wrong assumption.

Cellphones were not tested for their human health safety before they were put on the market years ago. It is the first time in the history of humankind that we have put microwave-emitting devices directly to our heads and expose our organs, including the brain, to the deep-penetrating microwave radiation. Any comparisons with TV stations, used to alleviate our worries, are a sham. We, the users, never have working TV antennae touching our heads. On the other hand, we have microwave radiation-emitting cellphones that, by design of modern engineers, work as antennae themselves.

Engineers and dosimetry experts try to convince us that cellphone-emitted microwave radiation causes only thermal effects and that any potential health danger caused by thermal effects is prevented by the 1998 ICNIRP (International Commission on Non-Ionizing Radiation Protection) safety standards.

There are, however, two untruthful statements made to us again and again by the experts.

The first untruthful statement is about the questionable existence of non-thermal biological effects. The non-thermal biological effects of cellphone radiation are real and have been shown and confirmed in numerous experimental studies. The problem is, and this helps in dismissing the non-thermal effects as either non-existent or irrelevant to human health, that the vast majority of studies showing the existence of the non-thermal effects are animal studies and studies on cells grown in a laboratory.

The other untruthful statement suggests that we are all well protected by the safety standards. How do we know it in situations where we do not know how the cellphone radiation affects the human body? There are in existence only three human volunteer studies examining the molecular-level effects of cellphone radiation on the human body: one study on protein expression in the skin (Karinen et al. 2008) and two studies on glucose metabolism in the brain (Volkow et al. 2011; Kwon et al. 2011). All three studies were small pilot studies, but all three have shown that cellphone radiation at levels allowed by current safety standards might induce biological effects in living persons.

It is puzzling that while there is an ongoing debate about whether cellphone radiation causes health effects in humans, there are only three studies that examined it... and have shown the possible non-thermal effects of cellphone radiation in human volunteers. How can the ICNIRP experts be certain that their safety standards protect all users, when there are practically no studies examining the physiology of people exposed to cellphone radiation?

There is an even bigger scientific problem with the radiation dosimetry itself. The measurements model used by scientists



Photo: [provincia.bz.it](http://provincia.bz.it)

to determine radiation distribution in the human brain consists of a plastic mold in the form of a half-head filled with a water solution of salt and sugar.

Scientifically, it is an absolutely ridiculous model. In this model, upon exposure to cellphone radiation, ions in the liquid are free to move around. There are no obstacles. In real living cells in our brains the situation is absolutely the opposite. Ions do not move freely. There are compartments where some ions are permitted to reside and some ions are not. The ions are prevented by various mechanisms to move freely. There are gradients of ions forming gradients of electric potentials that are the basis of functioning of our cells and tissues, the brain included. The function of our whole body depends on electric potentials. That is why the dosimetry model of a mold with fluid where ions can move freely is scientifically ridiculous. It is a "dinosaur" relic from the times when computers had very little computing powers and to "crunch numbers" the models had to be very simple.

With all the above listed limitations of scientific evidence, the World Health Organization and ICNIRP claim that current safety standards are sufficient to protect everyone.

However, evidence demonstrates that the ICNIRP safety standards are insufficient for the protection of adult users.

In 2011, a group of 30 experts\* met at the International Agency for Research on Cancer (IARC) in Lyon, France and for nearly two weeks debated whether cellphone radiation could cause brain cancer. The result of this debate was the classification of cellphone radiation as a 2B Possible Carcinogen to humans. The basis for such a classification was provided by epidemiological case-control studies showing that avid use of cellphones (ca. 30 min/day for over a 10-year period) by adults leads to increased risk of brain cancer—glioma. There were no such studies available for children or people with otherwise compromised health.

The IARC classification of cellphone radiation invalidates the protective claims of the current safety standards.

In epidemiological case-control studies evaluated by the IARC, adult participants used regular, off-the-shelf, cellphones.

These cellphones were built to fulfill the ICNIRP safety standards. However, avid use of such "safe" phones for a period of over 10 years led to an increased risk of

brain cancer.

This means that the current safety standards do not sufficiently protect users of cellphones.

This situation of scientific uncertainty calls for an action—the implementation of the Precautionary Principle (PP). There are several conditions that need to be fulfilled before debating the implementation of PP:

PP can be implemented when scientific information is insufficient, inconclusive, or uncertain.

IARC classification of cellphone radiation as a possible carcinogen has clearly shown that the information on health effects of cellphone radiation is "insufficient, inconclusive, or uncertain."

PP can be implemented when there are indications that the possible effects on human health may be potentially dangerous.

IARC classification of cellphone radiation, based on the evidence from epidemiological case-control studies, has pointed out that avid, long-term cellphone users are at an increased brain cancer risk—this is a potential danger to over six billion cellphone users.

PP can be implemented when the current situation is inconsistent with the chosen level of protection.

IARC classification pointing out an increased brain cancer risk is based on epidemiological studies where subjects used regular cellphones meeting current safety standards; this means the current safety standards are insufficient to protect users.

Final conclusion: To protect cellphone users, the outdated and obsolete 1998 ICNIRP safety standards should be tightened to reflect the current status of scientific knowledge. Based on the IARC 2011 classification of cell phone radiation as a Possible Human Carcinogen, the authorities should implement the Precautionary Principle.

The time to act is now.

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**Model-head photo (left):** Specific Anthropomorphic Mannequin (SAM); "The measurements model used to determine cellphone radiation distribution in human brain consists of a plastic mold in the form of a half-head filled with water solution of salt and sugar... a mold with fluid where ions can move freely is scientifically ridiculous." ~ Dr. Dariusz Leszczynski

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*With two doctorates and docentship in biochemistry, Dr. Dariusz Leszczynski has 22 years of experience at Finland's Säteilyturvakeskus (Radiation and Nuclear Safety Authority), including four years as Head of the radiation biology laboratory and 13 years as research professor. He has also served as assistant professor at Harvard Medical School, Guangzhou professor at Zhejiang University in China, and visiting professor at Swinburne University of Technology in Australia. Dr. Leszczynski testified in the U.S. Senate hearing on cellphones and health in 2009, and was one of the 30 experts invited by the IARC to evaluate the carcinogenicity of cellphone radiation in May, 2011.*

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