

Mobile communications and health of population: risk assessment, social and ethical problems. Russian view.

Professor Yury Grigoriev

Russian National Committee on Non-Ionizing Radiation
Protection

Federal Medical Biophysical Centre, FMBA of Russia

Moscow, Russian Federation

Madrid, 17-19 May

Mobile communication is a completely new additional source of radiofrequency electromagnetic field (RF EMF) exposure on the population

- **Mobile phones:** daily local RF EMF exposure of brain, vestibular and acoustic apparatus of internal ear of the users of all ages
- **Base stations:** permanent total RF EMF exposure of all the population in everyday life (forced exposure !)

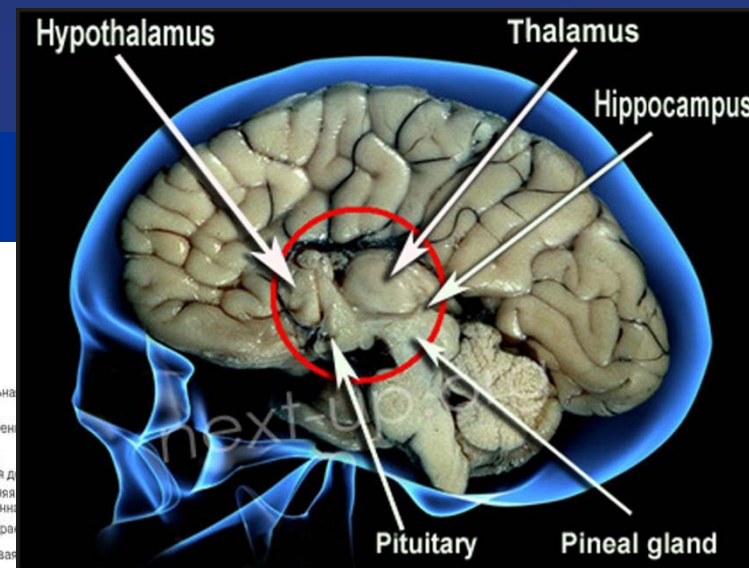
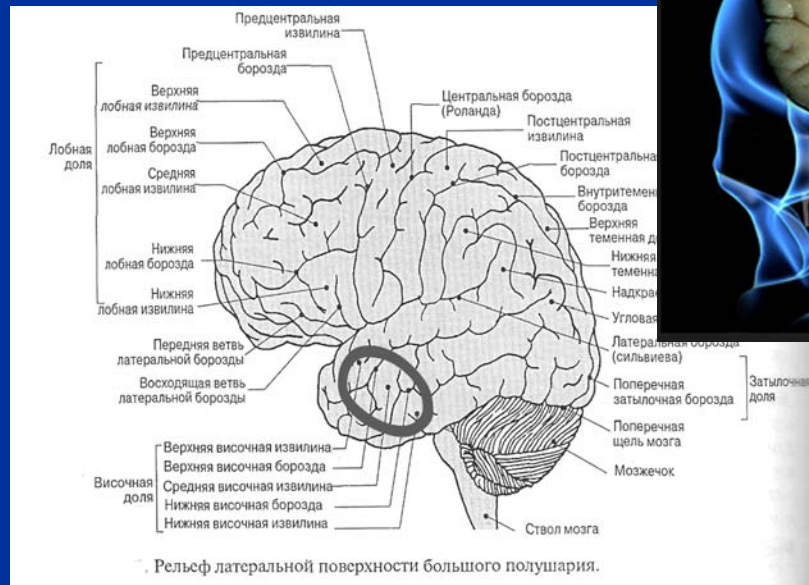
- EMF is considered a potentially adverse factor
- The EMF safety standards are of special importance in such situation

We have no right to make mistakes!

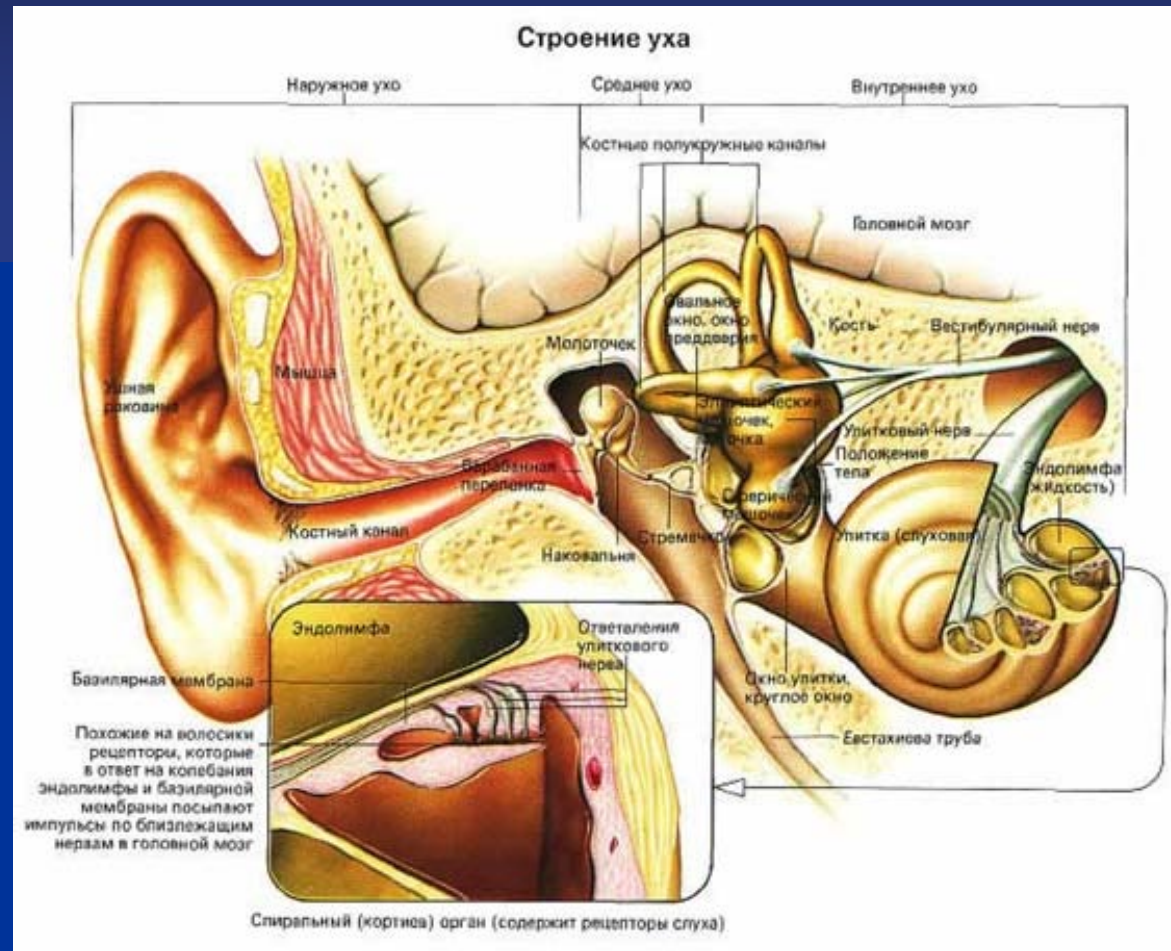
Mobile phone



Vital brain structures are under EMF exposure a daily



Internal ear : vestibular and acoustic receptors of analyzers under EMF beam



The brain is a critical organ

The brain when using a mobile phone is a critical organ (at terminology radiobiology of ionizing radiation-the hematologic system is a critical organ for ionizing radiation):

- 1. Brain has a direct exposed to radiation.**
- 2. Brain is organ of permanent complex biophysical processes and vital functions.**

FACTS & ARGUMENTS



Salford L.

Blood-
brain-
barrier



Hardell L.

Cancer

IARC conclusion
May 31 2011

RF EMF exposure and convulsive syndrome

- “Kindling-ES” – repeated electro-stimulation of *hippocampus* results in occurrence of epileptic status
(Grigoriev Yu., Timofeeva O., 1984)
- *Hippocampus* is a critical brain structure for RF EMF exposure

RF EMF exposure and convulsive syndrome

We have created a complex signal of EMF exposure (complicated *modulation*, used several carriers) which caused convulsions in animals after RF EMF exposure a very low intensity.

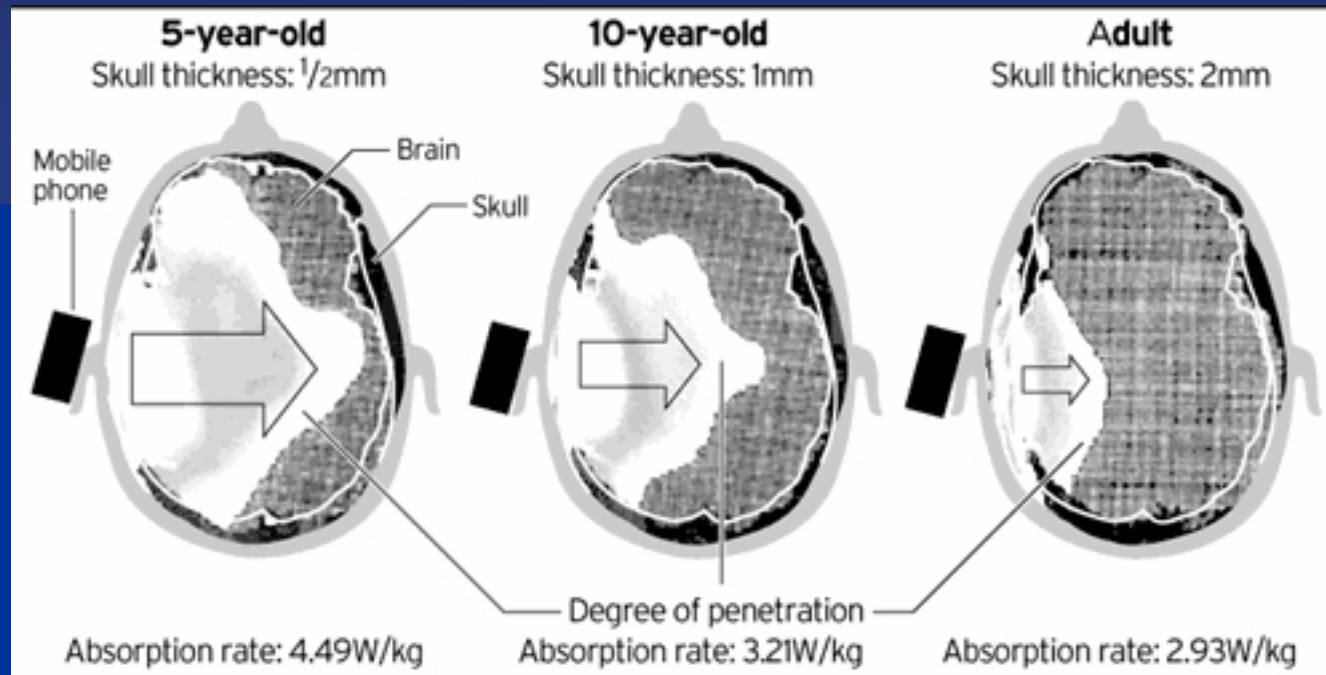
**Grigoriev Y. Nonthermal Electromagnetic Fields and Estimation of the Probable Development of the Convulsive Syndrome., Biophysics, 2011, Vol. 56, No. 2, pp. 351–357
(In English).**

Mobile phones and children

Madrid, 17-19 May

11

Mobile phones and children



Gandhi et al., 1996

Mobile phones and children

New reality of RF EMF exposure of children:

- No complete data for the chronic RF EMF exposure of children (psychophysiological studies).
- Data obtained for adults cannot be extrapolated to children

Child-Users of Mobile Phones: Study of Cognitive Function

Russian program “Children’s brain and mobile phone”

- Principal investigators: professor Yury Grigoriev and Dr. Natalia Khorseva
- Lyceum no. 10 (Khimki, Moscow Region)
- Since 2006
- Children 5-13 years of age
 - Test group (users) – 158 children.
 - Control group (non-users) – 67 children
- Comprehensive psychophysiological and neuropsychological tests



Child-Users of Mobile Phones: Study of Cognitive Function

Preliminary results

- Decrease an ability for work (50,7%)
- Increase of fatigue (39,7%)
- Decrease in indexes of voluntary attention (14,3%) and semantic memory (19,4%)
- Change audio-motor response (66,7%)
- Increased number of phonemic reception (79,3%)

No pathological changes yet!

**IMPORTANT! Children are
in the risk group for the
first time during the entire
period of civilization.**

Quasi-International Guidelines and Russian Standard – Two Different Philosophies

- Quasi-International guidelines (ICNIRP, IEEE, etc.)
 - Based on biological effects of **single, short-term, acute thermal RF EMF exposure**
- Russian EMF safety standard (SanPiN 2003)
 - Based on biological effects of **chronic non-thermal RF EMF exposure**

Real Situation of RF EMF Exposure and Existing Safety Standards

- The population is **not** typically exposed to **ACUTE** RF EMF of **THERMAL** levels in everyday life or even in the workplace.

Real situation

- The population now has **PERMANENT** contact with **LOW-LEVEL** RF EMF and **RF EMF CHRONIC EXPOSURE**. Standards do not take into account that the brain is a critical body

Conclusions about standards

- The existing EMF safety standards **have become outdated** (are obsolete-European Parliament, 2009, item 22).
- The standards **cannot guarantee the safe and healthy development of the population**

COMPARATIVE EVALUATION OF THE DEGREE OF THE HAZARD OF EXPOSURE OF POPULATION BY IONIZING AND NON -IONIZING RADIATION (RF EMF)

IONIZING RADIATION	NON-IONIZING RADIATION (RF EMF)
There is no permanent exposure	The permanent 24-hours daily irradiation of population including brain
Stability of ionizing radiation level in the environment	The permanent increase RF EMF level in the environment
Sources of radiation are strictly controlled	Mobile phone is open (without shield) source and out of control
Biological effect mechanism is well studied	Biological effect mechanism is in the period of study
Pathology including remote effects was well studied. Effective prophylaxis, therapy and protection are worked out	Pathology is not studied, including remote effects. Prophylaxis and protection devices are not worked out
Linear the dose -response	There is no direct dependence a dose - response. Importance of modulation!
Standards are correspond	Standards are not correspond
OVERALL SITUATION	
Hazard underestimation in 1947 -1986 (before the Chernobyl accident, 1986)	Hazard underestimation since 70ths till now
Adoption of decisive protection measures of control and prophylaxis only after Chernobyl accident (1986)	Absence of decisive measures. Waiting, watching and contemplating

□

**Silent about this
situation is morally
wrong**

Important postulate for risk assessment

- **Mobile phone is open (without shield) and not a controlled radiation source.**
- **The brain of all populations is constantly exposed to RF EMF, daily (for the first time during the entire period of civilization).**
- **Children at risk group (for the first time during the entire period of civilization).**

Important postulate for risk assessment

As a consequence:

- **Standards do not meet the criteria of EMF exposure on people: conditions of new - old standards.**
- **For the first time during the entire period of civilization people are actively using the mobile connection in the absence of correct standards.**

Important postulate for risk assessment

- **The world scientific community has no scientific data on remote consequences of this chronic, low-level exposure to future generations. An exception is the decision of the IARC on May 31, 2012**

**Thank you very much for
your attention!**