

Comments to US Department of Health and Human Services

Docket HHS-OASH-2026-0397

Biological Effects from Exposure to Wireless Radiation

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Wireless radiation standards issued in 1997, 29 years ago, are grossly outdated. Cell phones were not common at that time, and most people used routers with wired cables to reach the internet. Federal Communications Commission (FCC) and International Commission on Non-Ionizing Radiation Protection (ICNIRP) safety limits [primarily address](#) effects of short-term heating, not the cancer, reproductive, neurological, and immune effects reported in [numerous studies](#). Research proves that humans experience biological effects from exposure to wireless radiation without heating tissue.

As the founder and former executive director of the [Center for Safer Wireless](#), my comments to this RFI are based on government reports and peer-reviewed research with 42 pages of references for you to consider. I refer to radiofrequency radiation (RFR) and wireless radiation interchangeably as the same kind of energy.

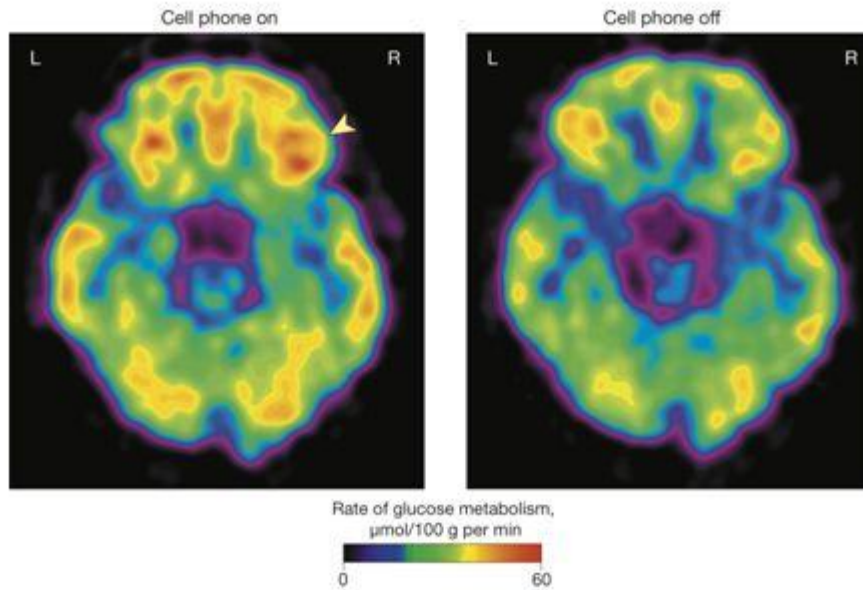
In my comments to the FCC, docket 12-84, I urged the agency to conduct analyses to update and issue more stringent safety standards for exposure to wireless radiation as soon as possible.

I suggest that US Department of Health and Human Services (HHS) and Food and Drug Administration (FDA) scientists review research in my comments, work with the National Institute of Health (NIH) to fill in and fund research holes, update the FDA website to reflect the majority of research in this space, and support the FCC to issue more stringent safety standards.

Wireless Radiation, EMR, and Radiofrequency RFR Biological and Health Effects

In 2011, the World Health Organization's International Agency for Research on Cancer classified wireless radiation emitted from cell phones as a class 2B, possible human carcinogen based on an increased risk for developing a glioma. (Benzene and formaldehyde are also rated as class 2B.) The FCC did nothing to review and update the standards, and 15 years later has remained frozen on the issue.

Research shows that wireless radiation creates biological changes in the brain. As shown in pictures below, Dr. Nora Volkow, in her [2011 research in JAMA](#), demonstrated that when a cell phone is on and placed at a human ear, glucose in the brain is activated. More glucose is indicated in the picture on the left than in the right picture when the cell phone is



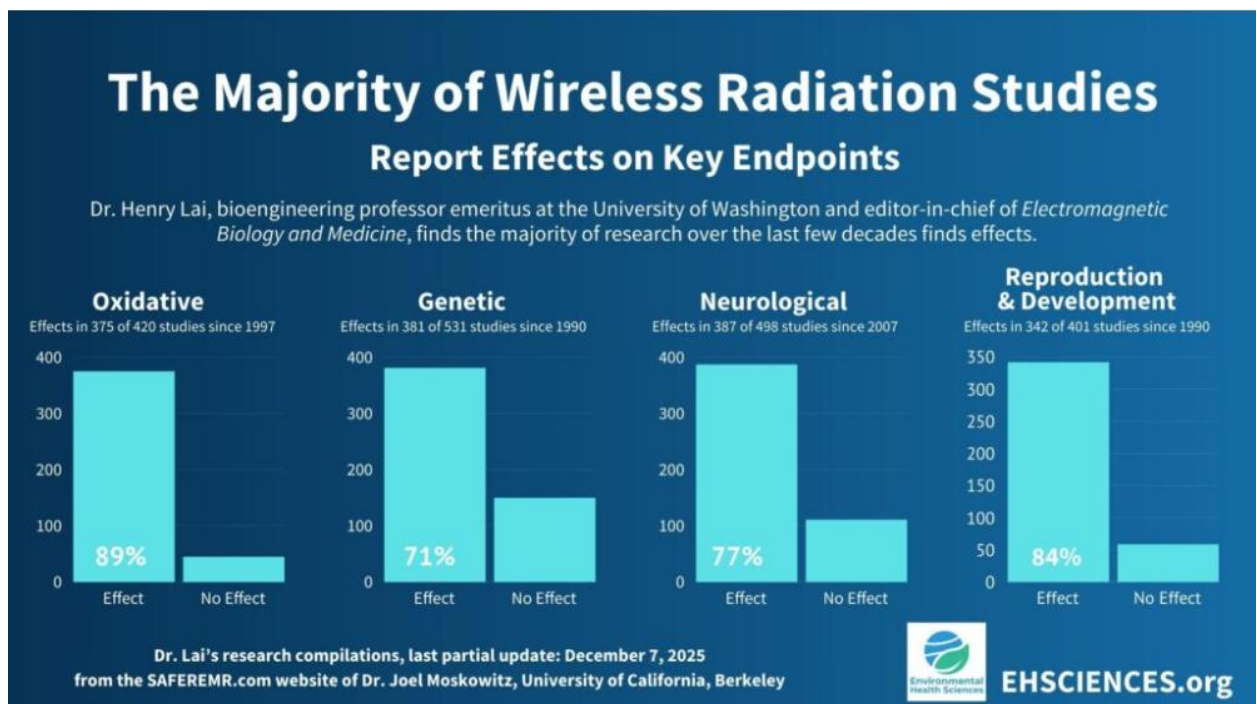
off.

Research in the resources section of these comments demonstrates that various levels of EMF and radiofrequency radiation exposures cause biological effects on animals and humans. Effects include:

- biochemical and pathological alterations in brains
- neuron degeneration
- blood-brain permeation
- brain energy metabolism
- cognitive impairment
- changes to histopathology
- nerve cell damage
- thyroid hormone dysfunction
- depression
- immunotoxicity
- longer subjective sleep latency
- long-term behavioral deficits
- mitochondrial stress in human skin cells
- impairments in spacial learning and memory

- absorption of 5G and 6G frequencies in the peripheral area of human sweat glands into the blood stream
- decreased sperm motility
- male infertility
- neurodegenerative diseases
- central nervous system tumors
- childhood leukemia
- increased risk of brain tumors
- increased risk of male breast cancer
- increased risk of emotional and behavioral difficulties in children

Most studies over the last few decades on the biological effects of exposure to wireless radiation report effects. See graph below provided by Environmental Health Sciences.



- **Genetics:** A comprehensive review of [over 500 studies](#) published in *Frontiers in Public Health* determined that a substantial amount of scientific research has reported genetic damage from exposure to wireless radiation in humans and animals.
- **Memory Damage:** In a prospective [cohort study](#) of adolescents, scientists directly estimated the amount of RF radiation absorbed by the brain and determined that

higher cumulative brain dose from cell phone use over a year was associated with damaged memory. The effect aligned with figural memory and brain regions on the side of the head most exposed to phone calls. This finding supports a dose–response relationship as opposed to screen exposure alone.

- **Developmental Delays:** A [2025 study](#) that measured RF radiation in homes found that children with higher exposure had significantly lower gross and fine motor skills and performed worse in problem-solving and personal-social development compared to children with lower exposure.
- **Endocrine System:** In studies on the endocrine system, which regulates hormones, [research](#) found impacts on thyroid gland activity, adrenal function, and corticosterone levels, a hormone important to the body’s stress response. Hormones are central to brain development, metabolism, reproduction, and the body’s stress response. [Animal studies](#) have found that prenatal exposure led to a decrease in rats’ estrogen and progesterone hormone levels, impacted the size of the rats’ ovaries, and reduced the number of developing follicles.

Specific Absorption Rate

The Federal Communications Commission set the maximum Specific Absorption rate limit for cell phones at 1.6 watts per kilogram (W/kg), averaged over one gram of tissue. This rate is far too high and needs recalculating based on current research.

A September 2, 2026 [study](#) published by the Institute of Physics and Engineering in Medicine explored full spectral range in far-field RF-EMF exposure in the 5G and 6G era for adults and children. Scientists computed psSAR, whole-body SAR, and organ-specific SAR following the IEC/IEEE 62 704–1 standard (IEC/IEEE [2017](#)) below 6 GHz, and APD following the IEC/IEEE 63 195–4 standard (IEC/IEEE [2022](#)) at or above 6 GHz. To the best of the authors’ knowledge, this is the first study to perform whole-body dosimetry at 26 GHz in child phantoms and to characterize child APD across the 7–15 GHz band. The 550 simulations compared phantoms and frequency bands revealing how compliance margins with ICNIRP 2020 basic restrictions vary with body size, frequency, and exposure scenario. The comparison revealed a result the reference levels do not account for. At 3500 MHz and 7 GHz, auto-induced beamforming meets the ICNIRP reference level yet exceeds the basic restriction. Below 6 GHz the compliance metric is whole-body SAR. Above it, the metric is APD. The study found that child models had 1.5 to 1.9 higher whole-body wireless radiation absorption rates than adult models at frequencies below 6 GHz. Child models demonstrated higher brain-to-skin wireless radiation absorption rates than adults at

frequencies below 6 GHz. Simulated 5G beamforming (focusing 5G signals into a narrow, direct beam) produced “hotspots” in the body. At certain frequencies, these exceeded absorption limits in youth and adult models. The study also found that absorption increasingly concentrated in skin as RFR frequency rose. Lower frequencies lead to higher absorption in deep tissue.

Cell Phones

Cell phones were not tested for health and safety effects prior to their 1984 entry in the market. When a cancer victim who believed the cancer was caused by cell phones attempted to sue the cell phone industry, a \$25 million research and surveillance program was developed in 1993 and funded by the cell phone industry. Dr. George Carlo led this effort that by 2001 showed red flags of warning that cell phone radiation could lead to the development of brain tumors, other cancers, or other adverse health effects. The resource section in my comments has the latest research on RFR exposure from cell phones.

Children

Children constantly use cell phones that could impact their development and overall health. They may experience long-term health effects from exposure to wireless radiation from cell phones, Wi-fi at home and school, cell towers, and household appliances emitting the energy.

In 2005, the [Journal of American Academy of Pediatrics](#) confirmed that children are especially sensitive to all electromagnetic fields because their developing nervous systems are fragile, their brain tissues more conductive, and their smaller skeletons more easily penetrated by the waves. Duration of cell phone use and ipsilateral use (using the same side of the head) increase health risks.

The 2018 infographic on the next page provided by [Environmental Health Sciences](#) and published in *Environmental Research* indicates how deeply cell phone radiation penetrates the skull of a 6-year-old child compared to a 36-year-old adult. The average absorption rate of radiation for the child was 2 times greater in the cerebellum and 30 times greater in the hippocampus than the adult. According to the World Health Organization’s International Agency for Research on Cancer, “the average exposure from use of the same mobile phone is higher by a factor of 2 in a child’s brain and higher than a factor of 10 in the bone marrow of the skull.”

STUDIES FIND HIGHER CELL PHONE RF RADIATION ABSORPTION RATES INTO A CHILD'S HEAD AND EYES

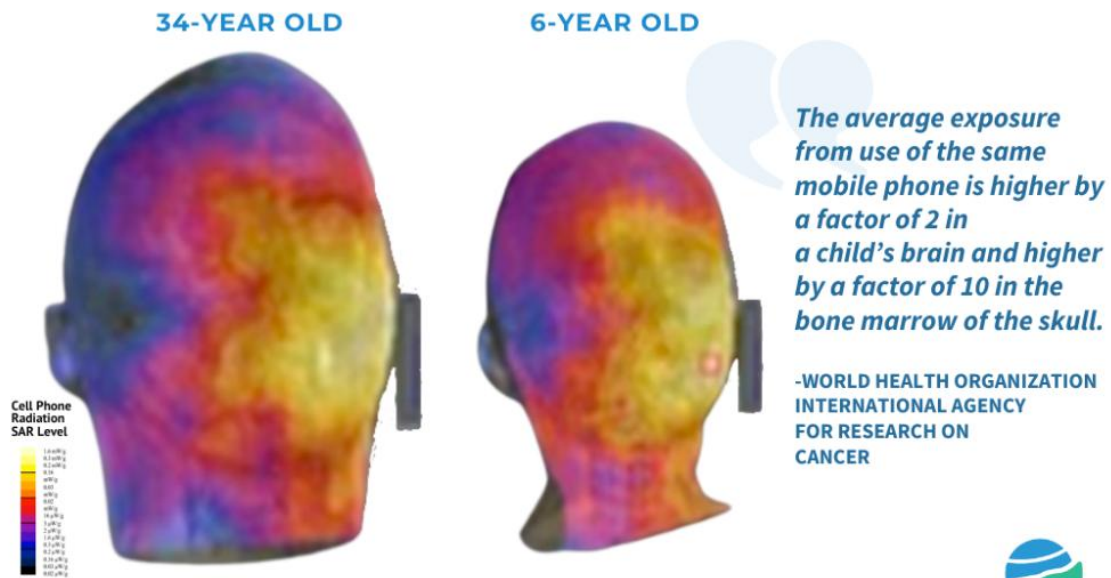


Image: Fernandez et al. (2018) published in *Environmental Research*

This engineering study found wireless absorption psSAR is ~2-fold greater in the cerebellum and ~30-fold greater in the hippocampus of the brain of children as compared to adults. The youngest child model's eyes absorb between 2 to almost 5-fold higher doses.

Tablets and E-Readers

Laptops, tablets and ereaders emit wireless radiation when connected via Wi-Fi. Those devices were not tested for long-term health and safety when approved for sale. Yet, students in classrooms across the United States use laptops, Chrome books, and other tablets throughout the school year. Students are exposed to wireless radiation from their devices as well as their neighbors' devices. There are as many as 5 transmitters inside tablets. Transmitters don't power down when not in active use. Specifically, when an iPad is on and next to you on a chair, you are still exposed to 5 transmitters emitting wireless radiation.

Wi-Fi

Most office buildings, libraries, schools, and homes use Wi-Fi technology to connect to the Internet on wireless networks. When Wi-Fi is on, there is pulsing microwave radiation present regardless of whether a computer is on or being used. Wireless radiation from Wi-Fi travels through most kinds of matter including walls, furniture, pets, and people, as well as into neighbors' homes.

Wi-Fi enabled products entered the marketplace with no prior health trials, like cell phones. As with cell phones, we don't know the long-term health implications of using this kind of connection to the Internet.

The “Internet of Things”

More wireless products are manufactured each day and often communicate with each other in the “Internet of Things.” Whether we live in a Wi-Fi soup at home, enter a store and encounter an anti-theft wireless radiation device at the entrance and exit, or walk down store aisles with wireless tags on products, we encounter an abundance of wireless radiation in everyday activities. Wireless household products are produced to continuously communicate with each other in homes, creating a mesh of wireless radiation inside our living spaces. Wearables are constantly connected to “smart” devices adding another layer.

Electrosensitivity

Electrosensitivity (ES) also called Electro Hypersensitivity (EHS) is an illness which flares or intensifies upon or following exposure to electromagnetic radiation emitted from electrical appliances, especially computer monitors, power lines, fluorescent lights, mobile phones, cordless phones, wireless computers (wLANs), mobile phone cell phone towers, etc. EHS is defined by the World Health Organization as: “...a phenomenon where individuals experience adverse health effects while in the vicinity of devices emanating electric, magnetic, or electromagnetic fields.”

People who have developed EHS have a physiological disorder, characterized by neurological and immunological symptoms which normally include some of the following:

- * Depression
- * Heart Arrhythmia
- * Fatigue
- * Insomnia
- * Headaches
- * Concentration problems
- * Aches in the head, throat and chest
- * Impaired balance
- * Tinnitus

* Numbness, tingling, or pain in an area

* Red skin blotches/eczema

Symptoms of electrosensitivity diminish with distance from the EMF source. However, it can take several days, weeks or even months if the person has become severely affected.

ES is not recognized as a medical diagnosis in the United States. The Centers for Disease Control and Prevention (CDC) utilizes ICD-10 codes (such as W90 for exposure to non-ionizing radiation) that allow physicians to bill for environmental events related to electromagnetic sensitivity, even if EHS itself is not a standalone diagnosis.

However, in Sweden it is considered a functional impairment. The Canadian Human Rights Commission recognizes ES as an environmental sensitivity and classifies it as a disability.

Some US federal employees who served in Havana, Cuba from late 2016 through May 2018 experienced wireless radiation attacks known as Havana Syndrome. The US federal government has compensated those with this ailment which means it recognizes electrosensitivity.

Workplace Exposure

Please review and consider the following studies on RFR in the workplace. A [case-control study](#) involving U.S. Air Force personnel suggested an increased risk of brain cancer among those who maintained or repaired radiofrequency emitting equipment. Another [case-control study](#) suggested an increased risk of death from brain cancer among men occupationally exposed to radiofrequency radiation, with highest risk among workers in electrical jobs involving design, manufacture, repair, or installation of electrical or electronics equipment.

Summary

The public is unaware that wireless radiation from cell phones, laptops, tablets, routers smart meters, transmitters, and appliances could negatively impact their health. Since radiation is silent and invisible, people don't realize how much of this energy they are exposed to daily and its potential health effects. The US federal government should inform them of these products' risks.

The long-term impact of exposure to this technology is uncertain, and thousands of research studies prove it can affect our health. FCC and ICNIRP limits [primarily address](#) effects of short-term heating, not the cancer, reproductive, neurological, and immune effects reported in [numerous studies](#).

Recommendations

Based on the reported health effects of this technology, it is imperative for the FCC to act now to revise safety standards and inform the public of health risks.

1. FDA can take some immediate small steps to raise awareness of health risks from wireless radiation. The website should be revised to state that cell phones emitting radiofrequency radiation cause biological effects that may harm human health, especially young children and teenagers. The [FDA website page on cell phones](#) has not been updated since May 14, 2021. Based on the reference section of my comments, a multitude of research papers on RFR proving health effects have been published over the past 5 years. FDA can also issue press releases and public service announcements about taking precautions with cell phones and Wi-Fi.
2. I urge FDA to test new wireless products (appliances, devices, and smart meters) communicating together to assess how much wireless radiation is continuously produced in a home or office environment and the biological effects on humans in those environments. After completing these health risk assessments, FDA should expeditiously release the findings.
3. The US Surgeon General can issue recommendations to the public on how to safely use cell phones, laptops, tablets, wearables, and other wireless devices.
4. Another important test involves flights in airplanes. Given that passengers are in such tight quarters, it is necessary to understand what levels of exposure they experience while flying. FDA scientists should conduct a health risk assessment and report results.

Using the most current studies on biological effects from wireless radiation, in 2026 the International Commission on the Biological Effects of Electromagnetic Fields ([ICBE-EMF](#)), a world-wide group of scientists, physicians, and researchers with expertise in wireless radiation and health, generated a [position statement](#) recommending safeguards to protect children from higher wireless radiation exposures. Please consider these recommendations.

ICBE-EMF's Key Steps for Schools should be implemented across the United States

- Replace all Wi-Fi networks with hardwired, shielded Ethernet internet connections.
- Purchase laptops and tablets with Ethernet capability.

- Require that all cell phones be powered off for the entire school day
- Require that all technology equipment have wireless transmitters disabled.
- Educate students, staff, and families on the risks of wireless and EMF exposure and how to reduce exposure.
- Minimize ELF exposures
- Ensure students are at a distance from electrical equipment and charging stations.
- Prohibit cell towers/base stations on or near school property
- Prohibit high-voltage power lines and electrical substations on or near property.
- Routinely conduct EMF measurements
- Continuously mitigate

A key scientist with ICBE-EMF, Dr. Melnick latest analysis recommended that current FCC, IEEE, and ICNIRP exposure limits are at least 200 times too high to protect against cancer risk and 24 times too high to protect against reproductive harm.

Watch his presentation at <https://lnkd.in/eBnhsFUZ>

More recommendations from the ICBE-EMF that HHS should follow include:

- Fund independent research on long-term, cumulative biological and health effects of non-ionizing EMF.
- Require independent pre-market safety testing and independent post-market surveillance for the health effects of wireless and EMF-emitting devices.
- Ensure wireless radiation compliance tests for cell phones, Wi-Fi laptops and other RF radiation-emitting devices reflect children's physiology and the way they use devices today, in direct body contact.
- Halt the introduction of new technologies until rigorous pre-market safety testing is performed.
- Inform families about the substantial science indicating health risks and educate them on ways to reduce exposures from cell phones, wireless devices, electronics, and other sources of EMF.
- Adopt a risk mitigation approach with strong policies that reduce children's daily exposure at home and school and limit their use of wireless devices.
- Promote industry innovation for the design and manufacture of safer technologies, including wired networks, low-emission designs, and devices that minimize user exposure.

- Low EMF spaces must be established in schools as a priority.

Some of the following studies have been referenced in my comments. Please review all these studies as part of your analysis and to inform next steps.

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