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Safeguarding Children's Health in the Digital Age: Addressing Screen Time, Wireless Radiation, and Extremely Low Frequency Non-Ionizing Electromagnetic Field Exposures

A Position Statement by the International Commission on the Biological Effects of Electromagnetic Fields

Who We Are

The International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF) is an independent consortium of scientists, physicians, and public health experts from around the world. We have published extensive peer-reviewed studies on the biological effects of non-ionizing electromagnetic fields (EMFs), including radiofrequency radiation (RFR) from wireless technologies and extremely low frequency (ELF-EMF) electric and magnetic fields from electric grid infrastructure. The Commission was founded to provide science-based evaluations of EMF exposure, to assess the adequacy of current exposure limits, and advocate for evidence-based exposure limits that protect human health and the environment.

Executive Summary

Wireless radiation and other non-ionizing EMF exposure are critical issues for children's environmental health. EMF exposures are increasing across all environments where children live, learn, and play due to the unprecedented proliferation of screens and wireless devices, the rapid expansion of wireless communication networks, and the electrical infrastructure required to power modern technologies, including AI. A risk mitigation approach is urgently required.

- Children can be more vulnerable than adults to the health impacts of wireless radiation because it penetrates deeper and has higher absorption rates in regions of a child's brain, and because their still-developing brains and physiological systems are more sensitive to environmental toxicants.

- Screen time not only increases exposure to digital media but also to non-ionizing electromagnetic fields (EMFs), including RFR from the wireless connection and ELF-EMF from their electrical components and charging systems.

- The wireless RF radiation limits developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the Federal Communications Commission (FCC), and the Institute of Electrical and Electronics Engineers (IEEE) based on the data of animal experiments carried out in the 1980s, mainly consider the impacts of thermal effects from short-term exposure. Similarly, the ELF limits of the IEEE and ICNIRP only consider optic nerve stimulation from short-term exposures. Based on outdated, invalid assumptions, these limits do not reflect the growing body of scientific evidence pointing to serious human health and environmental risks.

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- Hundreds of scientists and medical doctors who are experts in the field are calling for more stringent, evidence-based safety limits and policies to reduce exposure to protect public health and the environment.

- Health protective measures, especially in schools, can be implemented to reduce childhood EMF exposures and improve child health risk management.

We Are Urgently Calling for Safeguards to Protect Children

Children are now exposed daily to multiple sources of artificially generated non-ionizing EMF, including the RFR from cell phones, Wi-Fi laptops and Wi-Fi networks in schools, wireless earbuds, smart-watches, wireless wearables, and cell towers. They are exposed to ELF-EMF from nearby power lines, substations, and electrical wiring, as well as electrically powered equipment. These exposures have increased dramatically to levels unprecedented in human history.[12]

The right to a safe and healthy environment is fundamental to children's human rights[3]. Schools are places for learning and development, both of which can be impacted by exposure to EMF. Because children cannot choose the environments in which they live and learn, adults have both a moral and legal responsibility to ensure those environments are safe.

Background And Rationale

Screen Time Is Harming Children's Health

Children's healthy development is being profoundly compromised by their overuse of screens and unchecked social media consumption. Many screen apps and social media platforms are addictive by design as they are engineered to maximize engagement and keep children online for as long as possible.[4] Further, neuroimaging studies demonstrate that constant digital stimulation activates the brain's reward circuitry in ways similar to addictive substances,[5,6] and gaming disorder is now formally recognized by the WHO as a behavioral addiction.[7]

As screen time increases, it often displaces critical developmental activities such as physical play, healthy sleep, face-to-face social interaction, and outdoor time.[8] Heightened screen use in children and adolescents is correlated with reduced grey/white matter volume and other structural brain alterations, particularly in the prefrontal cortex, which can lead to impaired executive function and reduced impulse control.[9,10]

Scientific research has reported that excessive screen time is jeopardizing children's mental and physical health, affecting sleep[11], cognition,[12,13] academic performance,[14] social and emotional development,[15-17] brain function,[18,19] visual health[20], cardio-metabolic function[21], and increasing risk of chronic disease,[22,23] including diabetes.[24,25]

However, a critical and largely unexamined variable in much of this important research is children's chronic exposure to the non-ionizing EMF emitted by screens and other wireless devices proliferating in homes and schools. Many of the adverse health effects associated with overexposure to screens, such as impacts on memory, attention, sleep, and headaches, are also reported in research on non-ionizing EMF exposure. While children's screentime studies often measure variables such as time on device, device type, content, and timing of use, the accompanying EMF exposure is rarely considered. Comprehensive research is needed to distinguish the effects of these various factors and/or their combined effects and inform effective strategies to protect children's health.

Children Are Exposed to Numerous Types of Non-Ionizing EMF From Screens.

Cell phones and other wireless electronics are significant everyday sources of non-ionizing EMF exposure for children, and they bundle several non-ionizing radiation-emitting technologies into a single device. Smartphones, tablets, laptops, smart speakers, smart watches, and gaming systems all create RF-EMF exposures from their Wi-Fi, cellular networks, and Bluetooth antennas, while also producing ELF-EMF from their internal electronic circuitry and charging systems.[26,27]

As children spend more time on cell phones and screens, their cumulative exposure to multiple, overlapping sources of non-ionizing electromagnetic fields (EMFs) is increased. Combined RF and ELF exposures often occur just inches from a child's face and abdomen and sometimes at zero distance from the body, substantially increasing the absorbed dose of non-ionizing EMF.[28,29]

Parents are generally unaware that there is RF-EMF exposure from devices even when they are not in use. It is important to understand that if a wireless device is powered on and has wireless networking activated, it is constantly receiving and transmitting RF-EMF. While the exposure is higher when the device is in active use, there is still significant exposure when the device is turned on but not in active use. Increasing distance from the device can significantly reduce exposure, as intensity is inversely proportional to the square of the distance from the source.

In addition, backlighting in screens emits artificial blue light, another type of non-ionizing EMF radiation with well-documented biological effects. Exposure to artificial light and EMF can suppress melatonin, which plays a crucial role in our immune system and regulates the body's circadian rhythm, the internal 24-hour biological clock that governs sleep–wake cycles and neuroendocrine processes.[30,31] Disruption of circadian rhythm can interfere with restorative sleep, affect brain development, and alter metabolic, endocrine, and immune function, contributing to chronic disease. [32-34] Light at night has been associated with health impacts, including increased breast, prostate, and colorectal cancer risk in several epidemiology studies of adults.[35-38] Given that many children and adolescents now spend hours using screens and video gaming late into the evening, often in bedrooms with always-on TVs and screens, the biological effects of this combined chronic nighttime exposure to artificial light and EMF warrant further investigation.

Children's Escalating Exposure to Environmental Levels of EMF From Modern Technology.

The rapid expansion of cell towers, 4G/5G, and soon 6G, wireless networks, wearables, and constantly connected "smart" devices is dramatically increasing continuous RF radiation exposure in homes and schools. At the same time, the rise of artificial intelligence is driving massive growth in energy-hungry data centers, new electric power lines and substations, further increasing environmental exposure to ELF-EMF, long linked to an increased risk of childhood leukemia.[39-42]

Combining different types of EMF exposures together, potentially also in the presence of other (e.g. chemical) environmental toxicants, creates the possibility of synergistic effects which are not considered within current exposure limits.[43-48]

The Scientific Research on EMF And Health Supports a Risk Mitigation Approach.

The current body of research provides sufficient evidence to warrant the adoption of policies that mitigate risk by reducing exposure.

Research has reported biological effects from exposure to non-ionizing electromagnetic fields (EMFs) at levels well below current FCC, ICNIRP, and IEEE exposure limits.[49,50] Studies have reported numerous adverse effects, including cancer,[51] oxidative stress,[52,53] genetic impacts,[54,55] blood-brain barrier permeability,[56,57] sperm damage,[58-61] structural and functional changes of the reproductive system,[62,63] impairments in cognition, learning and memory,[64-67] sleep impacts,[68-70] EEG alterations,[71,72] and other neurological effects[73]as well as multi-systemic acute symptoms, including electromagnetic hypersensitivity.[74-76]

Cancer Is Associated with EMF Exposure

In 2001, the International Agency for Research on Cancer (IARC) of the World Health Organization categorized ELF- magnetic fields as a Group 2B "possible" human carcinogen due to the association of residential exposure with childhood leukemia. In 2011, IARC classified wireless *RFR* as Group 2B 'possibly' carcinogenic to humans, largely due to studies associating heavy cell phone use with brain cancer. Since then, evidence reporting an association between wireless radiation and cancer has increased.[77-81] Multiple case-control epidemiological studies have found increased risks for tumors associated with long-term cell phone use.[82,83] A 2026 paper demonstrated that *RFR* can promote tumor growth.[84]

Furthermore, the human epidemiology studies are now corroborated by large-scale animal studies, including those by the Ramazzini Institute and the U.S. National Toxicology Program, which concluded there was "clear evidence" of cancer and DNA damage *after long-term RFR exposure*.[85-88] Published analysis of this data concluded that the wireless radiation limits adopted by the IEEE, ICNIRP, and the U.S. FCC for cell phones, cell towers, and other wireless technologies allow public exposures hundreds of times higher than levels derived using EPA

cancer risk assessment methods designed to limit lifetime excess cancer risk to approximately one additional cancer case per 100,000 people exposed.

Although human studies have focused on adult populations, these findings are relevant to children as they could indicate increased risk of tumor development later in life, and risk from early exposures will likely be greater given children's immature physiology and greater cumulative exposures.

Children are More Vulnerable than Adults to Wireless and Non-Ionizing Radiation Exposure.

Children are especially susceptible to environmental stressors. Their brains and bodies are more sensitive, and toxic exposures during critical developmental periods can result in long-lasting and irreversible effects.[89]

Because of their thinner skulls, higher water content, and unique physiology, children absorb proportionally higher rates of *cell phone* radiation compared to adults, [90] as studies have reported exposures up to 30 times greater in the hippocampus[91] and 10 times greater in the bone marrow of the skull.[92] Similarly, research on cell tower radiation has found that children's brains can absorb at rates 25–30% greater (up to ~50% at some frequencies). [93]

Intra-uterine development during pregnancy is also a period of heightened sensitivity, as fetal development involves complex and rapidly growing cellular systems that are particularly vulnerable. Numerous studies have reported a range of adverse effects following prenatal EMF exposure in both humans and experimental animal species at exposure levels below FCC, IEEE, and ICNIRP limits. Studies investigating prenatal exposure have reported increased miscarriages,[94] impacts to the brain,[95] decreased memory[96] and cognition,[97] changes in behavior,[98,99] and altered growth and development.[100] Parental exposure has been shown to affect the morphology and functions of the reproductive organs.[101] These effects could lead to abnormal fetal growth/development and eventually affect the general health of the offspring.

Children today will face lifelong exposure to non-ionizing radiation from multiple sources, beginning before birth and lasting far longer than any generation before them. Today's 4G/5G dense, heterogeneous networks, constantly-on wearable devices, and smart city infrastructures, etc., mean that people, especially children, are exposed to multiple RF sources simultaneously.

Government Safety Limits Do Not Protect Children.

Numerous scientific publications conclude that government limits for allowable human exposures to wireless RF radiation, such as those of the United States Federal Communications Commission (FCC), the International Commission on Non-Ionizing Radiation Protection (ICNIRP), and the Institute of Electrical and Electronics Engineers (IEEE) do not adequately protect public health and should be updated.[49, 102-106] These limits remain unchanged for over 3 decades, well before children began using cell phones and when much of today's technologies did not even exist.

A summary of just a few of the key deficiencies of wireless RF radiation exposure regulations includes that they:

- Are based primarily on preventing tissue heating during short-term exposure.
- Do not account for the known biological effects from repeated or long-term exposure.
- Do not address synergistic effects when combined with chemicals, heavy metals, or other toxic environmental exposures, or the combined effects of simultaneous exposure to multiple EMF sources.
- Are not based on an up-to-date health risk assessment of the research reporting cancer and other biological impacts, including effects on the brain and nervous, endocrine, immune, and reproductive systems, genetic effects, and oxidative stress.[107]
- Were derived from insufficient studies in experimental animals applied to large adult males.
- Lack adequate safety factors that account for children's unique vulnerabilities.
- Authorize outdated cell phone and wireless device RFR compliance tests that do not reflect children's real-world use of multiple devices in close body contact. Premarket tests use a phantom of a large adult male using just one wireless device.
- Do not require cell phones and wireless devices *to be tested in direct body contact.* Instead, companies test with a separation distance between the body phantom and the phone.[108] Cell phones have been found to exceed ICNIRP and FCC limits when tested in direct body contact positions, the way most children use phones today.[109]
- Do not consider impacts on nature, wildlife, pollinators, plants, and trees, essential to healthy ecosystems on which present and future generations depend.[110]

The situation is equally inadequate when it comes to limits for power line and electric substation ELF-EMF, because IEEE and ICNIRP limits, used by numerous governments, are based only on acute impacts such as optic nerve stimulation from short-term high exposures, rather than chronic disease risk. Increased risk of cancer, miscarriage, and neurodegenerative diseases such as Alzheimer's is documented at ELF- EMF levels well below these limits.[40, 94, 111] While several countries have adopted public health policies to reduce children's EMF exposures to levels below the 3-4 mG (milligauss) levels associated with increased childhood leukemia risk, many other nations have simply adopted the IEEE or ICNIRP limits, which are thousands of times higher.[112,113]

The approach to this issue should be to reduce exposures to levels demonstrated to be safe for children. The failure to update exposure limits for non-ionizing EMFs in the face of mounting scientific evidence portends a public health crisis, endangering children, families, and future generations worldwide. We join with thousands of scientists, medical doctors, public health experts, and policymakers who recommend reducing risk to children by reducing their exposure.[114-148]

As the International EMF Scientists Appeal states, "the various agencies setting safety standards have failed to impose sufficient guidelines to protect the general public, particularly children who are more vulnerable to the effects of EMF." [149]

Necessary Measures to Protect Children

We call on all governments, school authorities, and communities to adopt technology policies that protect children's health and future. Children have the right to grow, learn, and thrive in environments free from avoidable health hazards. The scientific evidence demands preventive action, which is long overdue. The technologies shaping our future should not compromise the health of the next generation.

Recommendations for Governments

- Update national exposure limits on wireless, power frequency, and other non-ionizing EMF to reflect current scientific evidence and to ensure protection against biological effects.
- 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.

The Importance of Protecting Children in Schools

Considering accumulating evidence and children's prolonged daily exposure, implementing exposure-reduction strategies in schools represents a prudent public health approach.[150-152] Schools should be safe environments for learning. Yet, the widespread use of wireless technologies from Wi-Fi laptops and tablets to smartboards and cell phones has transformed classrooms into settings of chronic, unnecessarily high EMF exposure.[153,154] Cell towers and new high-voltage power lines are increasingly being constructed on or near school grounds, further increasing exposures.[155-159]

ICBE-EMF experts, along with numerous other expert bodies, have long recommended that safeguards be implemented to reduce EMF exposures in schools to protect children and staff from health risks.[160-163] Banning the use of cell phones in schools is a step forward, as it not only reduces children's RFR exposures but also eliminates distractions and supports learning. Laptops and tablets connected with a wired network, rather than Wi-Fi, will also significantly reduce RF radiation exposures. In addition, EMF exposure from outdoor environmental sources such as cell towers, electric substations, and power lines also needs to be regularly assessed and mitigated.[164]

A Safer Classroom: EMF Mitigation Steps for Schools to Protect Children, Teachers, and Staff
(Applicable for all personnel and technologies)

- Replace all Wi-Fi networks with hardwired, shielded Ethernet internet connections.
- Purchase laptops and tablets with Ethernet capability, and with easy steps to disable wireless antennas so that computers connect to the internet with Ethernet only.
- Require that all cell phones be powered off for the entire school day and stored in a Faraday box or other shielded storage to reduce unnecessary RF exposure and minimize classroom distractions.
- Require that all devices and technology equipment used in schools have wireless transmitters (intentional radiators) disabled, ensuring that no wireless radiation sources operate within school buildings.
- Provide wired telephones for personnel in all classrooms.
- Educate students, staff, and families on the risks of wireless and EMF exposure and how to reduce exposure.
- Minimize ELF exposures by ensuring adequate grounding, use of shielded cabling, twisted wiring, and devices with low ELF emissions.
- Ensure students are at a distance from electrical equipment and charging stations.
- Prohibit cell towers/base stations and other wireless emitting antennas on or near school property as is already the policy in some countries and U.S. school districts.[165]
- Prohibit high-voltage power lines and electrical substations on or near school property.
- School boards should maintain a team that can routinely conduct transparent, independent real-time EMF measurements (including body-worn *dosimeters*) in classrooms, playgrounds, and sports fields to ensure the lowest possible levels are maintained.
- Continuously mitigate as required to ensure the above principles are adhered to.

Determining Protective Setbacks for EMF-Emitting Infrastructure

Because EMF exposure and health impact cannot be predicted by distance from the source alone, each proposed cell tower or power line should be evaluated on a site-specific basis. Factors such as frequency, antenna orientation, signal modulations and beamforming now common in 5G systems, transmission characteristics, nearby structures, terrain, and time spent at a location all influence actual cell tower radiation exposure to a child. For power lines, electric

and magnetic field exposure levels can vary substantially depending on the line voltage, current load, line configuration, and other site-specific conditions. Moreover, published research has reported biological effects at exposure levels well below current regulatory limits, and some children may be more impacted than others.

Although no setback distance should be interpreted as a guarantee of safety, setting minimum setbacks between a school and specific types of EMF-emitting infrastructure is a reasonable public health strategy to begin to manage risk. Several scientific studies going back over a decade have recommended minimum setbacks of at least 500 meters (1640 feet) for cell towers.[166] In addition, there are local governments with high-voltage transmission line setback limits of at least 609 meters (2,000 feet).[167] Technology is rapidly changing. While such measures can often *reduce exposure*, emitter parameters and the exposure environment can vary, significantly altering the electromagnetic environment over distances. Thus, a more comprehensive site-specific assessment (beyond distance) for each installation is always required to fully characterize the exposure. Moreover, science-based exposure limits and exposure evaluations that account for today's complex multi- source cumulative anthropogenic EMF exposures and children's vulnerabilities are needed.

Governments, educators, and industry must work together.

By acting now to reduce exposure and adopt safer technologies, we can better ensure technological progress does not come at the expense of the next generation's health and well-being.

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[108] Cell phone RF compliance testing requirements vary by country, and different SAR limits apply to the head, body, and extremities. Just as important, however, is how compliance cell phone testing is performed.

Children and teens may use cell phones pressed against the chest, carried in a pants pocket, or connected to earbuds while the phone remains directly against the body. Yet cell phones are not required to demonstrate cell phone radiation SAR compliance in direct body contact before sale (at 0mm from the body). Instead, manufacturers test body-worn exposure at a specified separation distance and provide fine-print instructions stating that distance. When phones are tested at 0 mm by governments doing surveillance or by independent investigations, a number of models have been reported to exceed RF radiation SAR limits.

When cell phones were first introduced decades ago, manufacturers were generally permitted to select the body-separation distance used for SAR compliance testing. These distances could be as large as 25 mm, reflecting the fact that phones were often carried in belt holsters rather than directly against the body.

Table: Cell Phone Manufacturers FCC Instructions to Users to Maintain Separation Distances

Phone Model	FCC Body Test Distance	RF Radiation Exposure Statement
Apple 17	5 -10 mm	"iPhone is evaluated in positions that simulate uses against the head, with no separation, and when worn or carried against the torso of the body, with 5mm separation, and when used in personal hotspot mode, with 10mm separation.
Samsung Galaxy Z Fold 3 5G	15 mm	"Body-worn SAR testing has been carried out at a separation distance of 1.5 cm… the device should be positioned at least this distance away from the body"
LG G8	10 mm	"Tested for typical use with the back of the device kept 0.39 inches (1.0 cm) from the body… a minimum separation distance of 0.39 inches (1.0 cm) must be maintained"
Google Pixel 9 Pro XL	10 mm	Highest SAR values are 0.92 W/kg against the head (no separation) and 0.99 W/kg against the body (1.0 cm); "Keep the device away from your body to meet the distance requirement"
Jitterbug Flip 2 Seniors	15 mm	"The phone meets FCC RF exposure guidelines provided that it is used with a non-metallic accessory with the handset at least 15 mm from the body."

In 2016, the European Union tightened its requirements by limiting body-worn SAR testing to a maximum separation distance of 5 mm. France has recommended tightening this further to 0 mm. In the United States, the FCC has *proposed* interim guidance that would require a minimum 5 mm separation and eliminate testing distances greater than 25 mm, but those changes *have not been finalized. A*s a result, manufacturers in the United States may still use separation distances of up to 25 mm when testing phones and other wireless devices against the SAM phantom. As of the writing of this statement, no country requires cell phones to be tested at 0 mm for body SAR compliance.

Dr. Marc Arazi, a French physician, coined the term “Phonegate” to describe this issue, comparing it to the Volkswagen “Dieselgate” scandal, in which laboratory testing did not reflect real-world operating conditions. The central issue is that phones can pass RF radiation compliance testing at the specified separation distance even though users may carry or press them directly against the body.

France has developed an extensive post-market surveillance program in which the national frequency agency, ANFR, tests phones after they are already on the market. As of September 9, 2026, PhoneGateAlert has documented 65 cell phones and wireless devices that ANFR testing found to exceed SAR limits. When ANFR has identified noncompliant models, manufacturers have either

withdrawn the devices from the market or issued software updates to reduce RF emissions so that the phones would comply. See PhoneGate Alert for details https://phonegatealert.org/en/list-of-mobile-phones-with-non-compliant-sars-removed-or-updated-in-france-2/

The United States does not publicly operate a comparable post-market surveillance program. However, in 2019, the FCC's own laboratory tested cell phones at a 2 mm separation distance and found that multiple models exceeded U.S. RF exposure limits. The FCC labeled the underlying test data "Confidential," and the results became public only years later through a public-records request. See: FCC Cell Phone Radiation Tests Released: Exposure Limits Were Exceeded.

France's experience also provides critical data on what happens when cell phones are tested close to the body. Beginning in 2012, ANFR tested phones as part of its market-surveillance program at 0 mm and found that many phones exceeded limits in body-contact positions. Dr. Om Gandhi analyzed ANFR test data from 13 popular phone models in the paper "Microwave Emissions from Cell Phones Exceed Safety Limits in Europe and the US When Touching the Body". All 13 models complied with the ICNIRP limit at the manufacturer-selected separation distance, but when tested at 0 mm, SAR values exceeded the European limit by factors of 1.6 to 3.7 and could exceed the U.S. FCC limit by as much as a factor of 11.

Another critical limitation of compliance tests is that the head and body phantom does not represent children. The phantom was designed to represent a large 220 pound adult male. It therefore does not model the smaller head and body dimensions of children, nor does the testing reproduce many common positions in which a child may hold or press a phone directly against the abdomen, lap, chest, reproductive organs, or other parts of the body. It also does not represent situations in which a child or an infant's head may be directly adjacent to a caregiver's phone.

Head SAR testing also requires careful consideration. Although it is commonly described as "0 mm" testing or in positions against the head, the phone antennas are not necessarily in direct contact with the phantom's skull. The test phantom includes an artificial ear, or pinna, which acts as a spacer between the phone and the head. The pinna is also treated differently under localized SAR limits allowing much more radiation exposure. As a result, the standardized head-test position does not reproduce situations in which a child presses the corner or edge of a phone directly against the skull.

The separation-distance issue extends beyond cell phones. Many wireless devices, including Wi-Fi routers, baby monitors, smart speakers, Wi-Fi hotspots, televisions, computers, and other wireless electronics, are sold with manufacturers instructions advising users to maintain a separation distance, commonly 20 cm, in order to remain within RF exposure limits. These instructions may appear in regulatory or safety information that most consumers never read.

Children, however, may hold, carry, play with, sit near, or sleep near these devices at distances much closer than those used for compliance testing.

Examples include:

- Amazon Echo Dot (4th Generation) Kids Edition — Safety and Compliance
  "…it is advised to use the Products in such a manner that minimizes the potential for human contact during normal operation."
  "This Device should be installed and operated with at least 20 cm between the radiator and your body."
- Samsung Smart TV 6200 User Manual
  "This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body."
- Amazon Echo
  "This device should be installed and operated with a minimum distance of 20 cm between the radiator and your body."
- Apple iMac Regulatory Compliance Information
  "This device should be operated with a minimum separation distance of 20 cm (8 inches) between the equipment and a person's body."

- Apple Watch Model A1553
  "When placing the Apple Watch near your face, keep at least 10 mm of separation to ensure exposure levels remain at or below the as-tested levels."

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See U.K Health Protection Agency (HPA) rationale2005 & 2009); DECC - Power Lines: Demonstrating compliance with EMF public exposure guidelines; Swiss Limits https://www.swissgrid.ch/dam/jcr:6de53c59-32f1-4607-a75d-c530ac908176/electromagnetic-fields-en.pdf and Loizeau N, et al, (2024) Extremely low frequency magnetic fields (ELF-MF) in Switzerland: From exposure monitoring to daily exposure scenarios, Environ Int 194:109181.

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[165] Several countries and jurisdictions, including Switzerland Greece, Bangladesh, Israel, Chile, regions in India, and Russia have adopted policies that restrict cell towers near schools and other sensitive sites, require setbacks, or impose lower RF exposure targets around children and healthcare facilities. In the USA, Under Connecticut law, enacted through Public Act 12-165 in 2012, a telecommunications tower cannot be located within 250 feet of a school or commercial child day care center unless the municipality's chief elected official approves the location or the Council makes the findings required by statute.

There are also many school boards that have banned cell towers on school property. Temecula Valley Unified (CA): Passed a resolution and policy prohibiting new towers and lease renewals as well as ensuring regular RF radiation measurements of existing towers. Los Angeles Unified (CA): Passed three resolutions banning cell towers at schools, including one that set a "cautionary level" for radiofrequency radiation at 10,000 times lower than US federal limits for public exposure. Palo Alto Unified (CA): Passed a resolution opposed to new cell towers at schools and in favor of a 1,500 foot setback.

For more details on schools and cell towers. See Environmental Health Sciences Countries and Schools That Prohibit Cell Towers on School Grounds https://ehsciences.org/are-cell-towers-safe/#InternationalCellTower

[166] The following are published literature recommending a cell tower separation distance of 500:
Pearce (2019) states "that deployment of base stations should be kept as efficient as possible to minimize exposure of the public to RFR and should not be located less than 500m from the population…"

Rodrigues et al. (2021) conclude that to "avoid hazards to human health, the safest solution would be to switch off the RBS (radio base station) in an area within a 500 m radius from residences, workplaces, hospital areas, kindergartens, and buildings."

Dode et al. (2011) found higher deaths from tumors within 500 meters from cellular base stations.

Levitt & Lai (2010) state, "as a general guideline, cell base stations should not be located less than 1500 ft (*500 m) from the population, and at a height of about 150 ft (*50 m)."

Khurana et al. (2010) found that eight of the 10 studies reported increased prevalence of adverse neurobehavioral symptoms or cancer in populations living at distances less than 500 m from base stations.

Pearce, J. M. Limiting liability with positioning to minimize negative health effects of cellular phone towers. Environ. Res. 181, 108845 (2020). https://doi.org/10.1016/j.envres.2019.108845

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In 2000, T-Mobile/Deutsche Telekom commissioned a report by the Ecolog Institute which documented the emerging science linking wireless radiation exposure to health impacts including cancer, DNA damage, blood brain barrier permeability, altered stress hormones, and other nervous system impacts. The Ecolog Report concluded by recommending a precautionary exposure limit 1,000 times lower than the FCC's current cell tower radiation limits that "should be rigorously adhered to by all base stations near sensitive places such as residential areas, schools, nurseries, playgrounds, hospitals and all other places at which humans are present for longer than 4 hours."

[167] In South Dakota, Deuel County adopted one of the strongest local transmission line setback ordinances in the United States, requiring new 345 kV and higher transmission lines to be located at least 2,000 feet from homes. However, the ordinance was later amended so that landowners can consent to reduced setbacks. Brookings County, South Dakota, has a 1,000-foot setback. Power County, Idaho has a 1,500-foot setback from residences, schools, hospitals, colleges, and daycare centers. Several countries have policies to minimize EMF exposure from powerlines, and they ensure a setback distance.

International policies on power line and substation EMF:
Netherlands: Since 2005, policies have been in place to reduce EMF in homes, schools, and kindergartens. The government recommended that local authorities maintain a distance between high voltage power lines and homes, schools, kindergartens, daycares and nurseries), so that children are not exposed to levels higher than 4 mG. In 2013, houses under 380–220 kV lines were bought out due to elevated exposure. In 2023, based on a scientific literature review and recommendations of the Health Council, the government issued an updated and expanded policy to prevent new situations where people stay for a long time in the area near overhead power lines, substations and electrical grid equipment where the magnetic field exceeds 4 mG (annual average).

Belgium: Flanders recommends new power lines should be avoided near schools and childcare centers, and exposure over homes should be minimized. Year-averaged exposure near new schools and childcare centers should not exceed 4 mG. In Brussels, transformers near areas where children under 15 are must maintain a 24-hour average below 4 mG.

There are several more countries with policies to reduce magnetic field EMF. See more international policies that aim to reduce exposure to power frequency EMF at https://ehsciences.org/powerlines-emf-elf-magnetic-fields-health/#UEEMF-Global-Policies-To-Min-Exposure