

EMR and Health

Report on electromagnetic radiation, health and well-being

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New Hampshire's precautions

The US state of New Hampshire has published a report recommending precautions to protect people and the environment from EMR.



A major report into the environmental and health effects of wireless and 5G technologies was published by the US State of New Hampshire in November 2020. The 'Final Report of the Commission to Study The Environmental and Health Effects of Evolving 5G Technology' was prepared by a Commission of participants with backgrounds in physics, toxicology, epidemiology, public policy and members of the telecommunications and business industries.

'All but the presenter representing the Telecommunications Industry ... acknowledged the large body of peer-reviewed research that shows that the type of RF-radiation generated by wireless devices can have a deleterious effect on humans, especially children, as well as animals, insects, and vegetation'.

The majority of the Commission endorsed a series of recommendations based on the precautionary approach that appear below. Three members of the Commission—representatives of the telecommunications and industry associations and a Senator—did not endorse these precautions and submitted

a minority report instead.

The report addressed the question of why US regulators maintain mobile phone radiation is safe when a large body of research suggests that it is not. 'This report documents how the leadership roles in some agencies (the FCC in particular) are filled by individuals with strong industry ties and hence are more focused on industry interests than the health of citizens.'

The report also referred to the fact that federal legislation does not give communities, cities or states power to make decisions about infrastructure in their domain and suggests this will be an important issue when approximately 800,000 new antennas are constructed for 5G.

The Commission expressed concern about the fact that today's citizens are living in a 'soup' of different frequencies and exposure will increase with time. It also acknowledged that the World Health Organisation and insurers are 'hedging their bets' about the safety of this radiation.

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Publisher EMR Australia Pty Ltd

ABN 82 104 370 658

PO Box 347,
Sylvania Southgate NSW 2224

Tel: 61 2 9576 1772

Web: www.emraustralia.com.au

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Swiss experts on wireless and health

Swiss experts say that electromagnetic fields, at levels that comply with international standards, increase oxidative stress which is implicated in many adverse health conditions.

In a special issue of their newsletter, BERENIS, the Swiss expert group on electromagnetic fields and non-ionising radiation, released the results of their review of approximately 150 animal and cell studies conducted between 2010 and 2020. '...the majority of the animal and more than half of the cell studies provided evidence of increased oxidative stress caused by RF-EMF [radiofrequency/wireless electromagnetic fields] or ELF-MF [power-frequency fields]. This notion is based on observations in a large number of cell types, applying different exposure times and dosages ... also in the range of the regulatory limits.'

Oxidative stress occurs when the body has more free radicals—molecules that contain oxygen and have an uneven number of electrons so that they react easily with other molecules—than antioxidants—molecules that neutralise free radicals. (The reaction of free radicals with other molecules is called oxidation.)

Oxidative stress is a factor in many health problems and diseases. The report says, 'If this state persists over a longer period of time or occurs repeatedly, it can lead to changes in the biological material and thereby to health-related malfunctions of cells and organs. Thus, increases in biomarkers for oxidative stress ... are observed in many diseases, such as cancer, diabetes, congenital malformations or neurodegenerative diseases.' Other conditions linked to oxidative stress include atherosclerosis (the hardening of blood vessels), inflammatory conditions, high blood pressure and heart disease. Oxidative stress is also involved in ageing.

The BERENIS team found that exposure to electromagnetic fields had harmful effects on the nervous system and negatively affected cognitive abilities, such as memory. 'Associated with longer exposure periods of weeks or months, even for just a few hours per day, an increase occurrence of ROS [free radicals], an overload and exhaustion of antioxidant protective mechanisms and damage to the DNA were reported for RF-EMF at various frequencies and doses ..., even at SAR [specific absorption rate] below the regulatory limits.'

The BERENIS report suggested that oxidative stress from wireless radiation may be increasing calcium influx into cells and this mechanism may be causing the damage to the body. They say, 'Voltage-dependent calcium channels ... for instance the TRP1 ... channels are involved in pain transmission and can be activated not only by stimuli such as heat, capsaicin, but also by oxidative stress.'

The BERENIS team investigated the effects of EMF-induced oxidative stress on the immune system. While they found no conclusive evidence that exposure affected immunity, they found 'indications in immune cells that RF-EMF influences the response to other stress factors.'

Studies also showed that the oxidative stress from exposure had negative effects on the reproductive system. 'The majority of the findings from the animal studies indicate a functional and morphological impairment of spermatozoa by RF-EMF exposure, which is associated with an increase of ROS, reduction of antioxidant capacity and lipid peroxidation.'

The report showed that age affected the response of exposed organisms. In both the nervous and immune systems 'very young animals could not compensate for oxidative stress.' In the nervous system, the elderly were more vulnerable to exposure 'due to reduced antioxidative capacity in the brain'.

People with existing health problems may be more vulnerable to exposure. 'Pre-existing conditions, such as immune deficiencies or diseases (diabetes, neurodegenerative diseases), compromise the body's defence mechanisms, including antioxidative protection, and it is therefore possible that individuals with these conditions experience more severe health effects,' the expert team wrote.

'Is there evidence for oxidative stress caused by electromagnetic fields? A summary of relevant observations in experimental animal and cell experiments related to health effects in the last ten years', Prof Meike Mevissen, University of Bern Dr David Schürmann, University of Basel, BERENIS – The Swiss expert group on electromagnetic fields and non-ionising radiation New sletter – Special Issue January 2021, [file:///C:/Users/User/Downloads/New sletter%20BERENIS%20-%20Special%20Issue%20January%202021.pdf](file:///C:/Users/User/Downloads/New%20letter%20BERENIS%20-%20Special%20Issue%20January%202021.pdf)

Dirty Science

A prominent German scientist has been ordered to desist from his campaign of attack on researchers who showed that mobile phone radiation resulted in DNA damage.

Microwave News reveals that the Hanseatic Higher Regional Court of Bremen ordered Professor Alexander Lerchl to desist from making unsubstantiated attacks on research conducted by Hugo Rüdinger and his team or choose between a 250,000 EU fine or six months in goal. The December judgment, which found that Lerchl did not have the evidence to support his claims, culminates a 14-year legal battle.

In the first of the studies to have attracted Lerchl's ire, Rüdinger found that mobile phone radiation of 1800 MHz induced single- and double-strand DNA breaks in human fibroblast and rat granulosa cells and that these effects occurred at exposures below the levels mandated by international standards. In the second study criticized by Lerchl, Rüdinger found that mobile phone radiation of 1950 MHz (3G) also caused genetic damage at levels below these standards.

Lerchl has waged a steady campaign against Rüdinger's research since 2007. He has called for the papers to be retracted, criticised the studies in the media, forced seven reviews of the statistical data they contained, complained to an Ethics committee and accused Rüdinger's assistant of fabricating data. He continued to condemn the research even after a Hamburg court ordered him to stop in 2015.

Lerchl has been a prominent figure in the world of RF-research and policy. He has received extensive funding for research, was a member of the German Radiation Protection Board and is, ironically, Professor of Biology and Ethics of Science & Technology at Jacobs University in Bremen.

<https://www.microwavenews.com/news-center/german-court-moves-silence-critic-rf-dna-breaks>; <https://microwavenews.com/short-takes-archive/big-rewards-bad-behavior>

Diem, E et al, 'Non-thermal DNA breakage by mobile-phone radiation (1800 MHz) in human fibroblasts and in transformed GFSH-R17 rat granulosa cells in vitro', *Mutat Res*, 583(2): 178-83, Jun 6, 2005

Schwarz C et al, 'Radiofrequency electromagnetic fields (UMTS, 1,950 MHz) induce genotoxic effects in vitro in human fibroblasts but not in lymphocytes', *Int Arch Occup Environ Health* 81(6):755-67, 2008.

Iphone 12 risks

The strong magnets present in the Apple iPhone 12 devices can interfere with the function of implantable defibrillators, say cardiologists from Henry Ford Hospital.

The iPhone 12's magnets are used to align the phone to the Apple charger to achieve quick charging. When the phone is worn in the breast pocket, it is close to the heart and the position of an implanted defibrillator. Magnets are also used by doctors to turn defibrillators off when necessary.

To see whether the phone's magnets would affect an implanted defibrillator, the cardiologists passed an iPhone 12 across a patient's chest and the result was the same on each occasion.'

'We brought the iPhone close to the chest and...discovered that the iPhone had deactivated the defibrillator which was a surprise to us,' said Dr Singh.

The team plans to conduct further tests, including testing the phones near pacemakers.

<https://nbc25news.com/news/local/henry-ford-cardiologists-find-iphone-12-magnet-deactivates-implantable-cardiac-devices>



Dutch court on phone tower risk

A Dutch court has found that low levels of radiation from a mobile phone base station could potentially harm health.

In a judgement delivered on 18 December 2020 in the district Court of Gelderland, the judge found in favour of a plaintiff who opposed the construction of a 40-metre transmitter approximately 500 metres from his home.

Construction of the transmitter had been approved by the Municipality of Berkelland, who was the defendant in the case.

The judgement stated, 'In the opinion of the court, considering all arguments, with reference to scientific literature, it cannot be ruled out that there are increased health risks even at a field strength lower than 1 V/m, and thus also in the plaintiff's case. The court therefore classifies the plaintiff as an interested party. The appeal is well-founded.'

Case number AWB - 19 _ 2184; <https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBGEL:2020:6699> (in Dutch)

Embassies and microwaves

Could microwave radiation have caused unhealthy symptoms in US embassy workers?

The answer is yes, according to a report from the US National Academy of Sciences (NAS).

In 2016 US embassy workers in Havana, Cuba and the US Consulate in Guangzhou began to report unusual symptoms and health problems. These included ear pain, head pain/headaches, pressure or vibrations in the head, dizziness, tinnitus, visual problems, vertigo, insomnia, unsteady gait and/or cognitive difficulties. In some cases, the condition became chronic and debilitating.

These symptoms are often reported by people exposed to radiofrequency radiation and consistent with the condition of electromagnetic hypersensitivity.

The NAS report investigated the situation and concluded that the symptoms, at least in some workers, were consistent with 'a disturbance to the labyrinth or the vestibulocochlear nerve or its brainstem connections'.

It also concluded that radiofrequency radiation could have been a factor. It says, '... after considering the information available to it and a set of possible mechanisms, the committee felt that many of the distinctive and acute signs, symptoms, and observations reported by DOS employees are consistent with the effects of directed, pulsed radio frequency (RF) energy.'

Among the recommendations in the report is that, 'If research or assessments support the possibility of radio frequency (RF) energy as a cause of illness experienced by some of its employees, the Department of State should train and equip employees with the capability to measure and characterize their exposure to RF energy in real time should the need arise in the future.'

National Academies Press, 'An Assessment of Illness in U.S. Government Employees and Their Families at Overseas Embassies (2020)', <http://www.gencourt.state.nh.us/statsudcomm/committees/1474/reports/5G%20final%20report.pdf>

Legal challenge to standards

In an historic US legal case, the Environmental Health Trust (EHT) went to the Federal Court to force the Federal Communications Commission (FCC) to update its radiation standards.

The EHT and other petitioners challenged the FCC about whether the data it used to set the country's radiation standard 24 years previously was appropriate to protect the population. They submitted over 11,000 pages of evidence to support their case.

According to the opening brief, 'This case involves the FCC's health and safety regulations for existing and new telecommunications technologies. The petitioners submit that the FCC's failure to update those regulations in the Order on appeal violates the Telecommunications Act of 1996' and other legislation.

'The justices questioned how the agency could ignore the undeniable fact that the types of devices, wireless uses and users of wireless devices are radically different today than they were when the standards were first set,' said Professor Devra Davis, president of the EHT.

Although the court has not yet released a judgment, the petitioners have made sure that the evidence they presented has been heard and tabled. 'At least this issue has seen the light of day and we really did get a day in court,' said Professor Davis.

EMR Australia will report on updates.

<https://ehtrust.org/us-court-hears-case-on-5g-safety-standards-eh-trust-et-al-v-fcc/>;

<https://childrenshealthdefense.org/defender/landmark-5g-case-against-fcc-hearing-set-jan-25/>;

<https://childrenshealthdefense.org/wp-content/uploads/Corrected-Brief-and-Hyperlinks-Table-Postable-pdf-A1.pdf>

China—no mobiles

The Chinese Ministry of Education has banned mobile phones from school grounds. In a directive issued in early February, the government forbade the use of mobile phones in classrooms or school grounds by students of all ages in order to prevent internet addiction and to protect students' eyesight.

Only students with special needs may bring mobile phones to school and then must surrender them to a teacher.

The Ministry has also banned teachers from setting students homework on their phones and asked schools to install payphones for students' use.

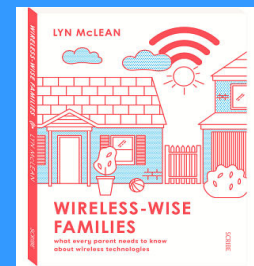
In 2018 France and Greece banned the use of mobile phones for younger students.

<https://www.inkstonenews.com/education/china-just-issued-full-ban-phones-schools/article/3120322>

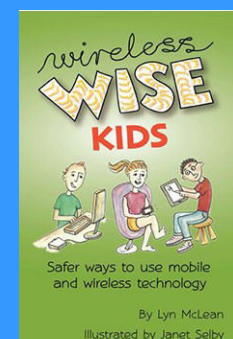
Books by Lyn McLean



The Force



Wireless-wise Families



Wireless-wise Kids

for everything you
everything you need to
know about keeping
your family EMR-safe

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Insects & wireless radiation

Honey bees pollinate most of the foods we eat, so are vital for human survival. But bees, and other insects, are under threat and there is evidence that their numbers are reducing. Not only might this trend lead to the extinct of many insect species, but it will reduce populations of animals further up the food chain and impact affect the production of food.

One of the reasons this is happening is thought to be wireless (radiofrequency) radiation. Alfonso Balmori reviewed research that has been conducted on the link between exposure to power-frequency fields and wireless radiation and the dedine of insect species.

He said, 'Insects are especially sensitive to electromagnetic radiation', possibly because they possess a similar sense of magnetoreception to birds, and that there has been evidence that that they are negatively affected by exposure for over half a century.

Some of the harmful effects on bees (from power-frequency and wireless sources) include:

- loss of queen cells
- changes to weight gain of hive
- poor survival in winter
- changes to propolisation
- changes to flight, foraging and feeding
- changes to short-term memory
- causes worker piping signals which can mean disturbance or preparation for swarming
- reduced egg-laying speed of queen
- no honey or pollen in a colony by the end of exposure
- lower weight of honeycomb
- increased mortality.

According to Balmori's review, harmful effects have also been observed on other insect species. 'As a result of most of the studies carried out, EMF radiation can be a problem for insects and for their orientation ... and both laboratory and field studies on different invertebrate species have shown this,' he said.

According to Balmori, 5G radiation could pose an even bigger problem because the wavelength of the signal will be closer in size to that of the insects' bodies, increasing the amount of radiation they absorb.

He recommends employing the precautionary principle and considering the impacts on insects before rolling out new technologies.

Balmori, A, 'Electromagnetic radiation as an emerging driver factor for the decline of insects', [Science of The Total Environment](#), vol 767, 1 May 2021, 144913; <https://www.sciencedirect.com/science/article/abs/pii/S0048969720384461>

'radiation can be a problem for insects and for their orientation'



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DNA damage

A new paper provides further evidence that both power-frequency and radiofrequency electromagnetic fields produce harmful genetic effects on living organisms—and that this can occur at levels that are found in public spaces and workplaces.

The research was conducted by Dr Henry Lai, Professor Emeritus Dept of Bioengineering, University of Washington, who showed that microwave radiation caused DNA damage as early as 1995.

In his new paper Lai analysed research conducted on this topic and found that 66% of wireless studies and 79% of studies on power-frequency and static fields showed genotoxic effects. These included breaks in DNA, the formation of micronuclei and changes to chromosomes.

Lai found that many studies showed that exposure altered the expression of genes, especially genes related to stress and protecting the cells from environmental damage. He also showed that electromagnetic fields can have a synergistic effect with other environmental compounds.

Lai explained that the effects that have been observed depend, not just on the type of organism exposed and the length of exposure, but the characteristics of the exposure, such as frequency, wave-form and intensity of exposure.

Lai, H, 'Genetic effects of non-ionizing electromagnetic fields, *Electromagn Biol Med*, Feb 4, 1-20, 2021; <https://www.tandfonline.com/doi/abs/10.1080/15368378.2021.1881866>

(Continued from page 1)

Recommendations

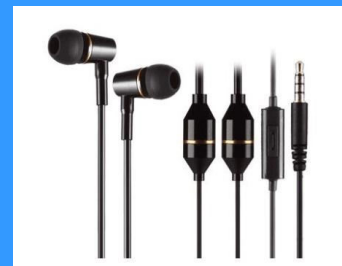
1. '...require the Federal Communication Commission (FCC) to commission an independent review of the current radiofrequency (RF) standards of the electromagnetic radiation in the 300MHz to 300GHz microwave spectrum as well as a health study to assess and recommend mitigation for the health risks associated with the use of cellular communications and data transmittal...'
2. 'Require that the most appropriate agency (agencies) of the State of New Hampshire include links on its (their) website(s) that contain information and warnings about RF-radiation from all sources, but specifically from 5G small cells deployed on public rights-of-way as well as showing the proper use of cell phones to minimize exposure to RF-radiation, with adequate funding granted by the Legislature. In addition, public service announcements on radio, television, print media, and internet should periodically appear, warning of the health risks associated with radiation exposure. Of significant importance are warnings concerning the newborn and young as well as pregnant women...'
3. 'Require every pole or other structure in the public rights of-way that holds a 5G antenna be labeled indicating RF-radiation being emitted above. This label should be at eye level and legible from nine feet away...'
4. 'Schools and public libraries should migrate from RF wireless connections for

(Continued on page 8)

Mobile phone protection



Wavewall mobile phone cases protect the head, body and the phone



Airtube headsets—no wire to conduct radiation into the head

'both power-frequency and radiofrequency electromagnetic fields produce harmful genetic effects on living organisms'

(Continued from page 7)

computers, laptops, pads, and other devices, to hardwired or optical connections within a five-year period starting when funding becomes available.

5. 'Signal strength measurements must be collected at all wireless facilities as part of the commissioning process and as mandated by state or municipal ordinances...'
6. 'Establish new protocols for performing signal strength measurements in areas around wireless facilities to better evaluate signal characteristics known to be deleterious to human health as has been documented through peer-reviewed research efforts...'
7. 'Require that any new wireless antennae located on a state or municipal right-of-way or on private property be set back from residences, businesses, and schools...'
8. 'Upgrade the educational offerings by the NH Office of Professional Licensure and Certification (OPLC) for home inspectors to include RF intensity measurements...'
9. '...measure RF intensities within frequency ranges throughout the state, with the aim of developing and refining a continually updated map of RF exposure levels across the state using data submitted by state-trained home inspectors...'
10. 'Strongly recommend all new cell phones and all other wireless devices sold come equipped with updated software that can stop the phone from radiating when positioned against the body...'
11. 'Promote and adopt a statewide position that would strongly encourage moving forward with the deployment of fiber optic cable connectivity, internal wired connections, and optical wireless to serve all commercial and public properties statewide...'
12. 'Further basic science studies are needed in conjunction with the medical community outlining the characteristics of expressed clinical symptoms related to radio frequency radiation exposure...'
13. 'Recommend the use of exposure warning signs to be posted in commercial and public buildings. In addition, encourage commercial and public buildings, especially healthcare facilities, to establish RF-radiation free zones where employees and visitors can seek refuge from the effects of wireless RF 'emissions...'
14. engage agencies with appropriate scientific expertise, including ecological knowledge, to develop RF-radiation safety limits that will protect the trees, plants, birds, insects, and pollinators...'
15. '...engage our Federal Delegation to legislate that under the National Environmental Policy Act (NEPA) the FCC do an environmental impact statement as to the effect on New Hampshire and the country as a whole from the expansion of RF wireless technologies...'

'Final Report of the Commission to Study The Environmental and Health Effects of Evolving 5G Technology', <http://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf>

Protect your family from wireless radiation



Shielding singlets for kids

Head protection

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'Schools and public libraries should migrate from RF wireless connections for computers, laptops, pads, and other devices, to hard wired or optical connections'