

EMR and Health

Quarterly report on electromagnetic radiation, health and well-being

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Wireless risks

Policies are needed to address radiation risks, warn scientists.



Radiofrequency radiation from mobile phones and other wireless devices is a public health concern that national and international authorities should address, and children are particularly at risk, say researchers from Canada, the US, Sweden and Australia, in a paper published in August.¹

'Current knowledge provides justification for governments, public health authorities, and physicians/allied health professionals to warn the population that having a cell phone next to the body is harmful, and to support measures to reduce all exposures to RFR,' they say.

In 2011 the International Agency for Research on Cancer (ARC) classified radiofrequency radiation as a Class 2B carcinogen. Since then, more evidence of carcinogenicity has emerged, the authors say. These include French and Swedish human studies, a major animal study by the National Toxicology Project, an animal study by Italy's Ramazzini Institute, as well as increased rates of different types of tumours in various brain tumour registers.

However, cancer is not the only risk for users of wireless devices. According to the authors, mobile phone radiation has harmful effects on sperm, decreasing sperm quantity, quality and motility and potentially reducing fertility. It has harmful effects on cognition and has been linked to symptoms such as 'headaches, fatigue, appetite loss [and] insomnia'.

Those most at risk from exposure are children because their nervous system is

still developing and they have a potential lifetime of exposure. 'A cell phone held against the head of a child exposes deeper brain structures to roughly double the radiation doses ... per unit volume than in adults and ... the marrow in the young, thin skull absorbs a roughly 10-fold higher local dose than in the skull of an adult male,' the authors wrote.

The fact that evidence of harm occurs at everyday levels of exposure suggests that current standards are not sufficiently protective, the authors say.

Given the evidence for risk, it's appropriate for governments to implement policies in line with the Precautionary Principle, the paper states. '...a total of 32 countries of governmental bodies within these countries have issued policies and health recommendations concerning exposure to RFR. Three US states have issued advisories to limit exposure to RFR and the *Worcester Massachusetts Public Schools* voted to post precautionary guidelines on Wi-Fi radiation on its website. In France, Wi-Fi has been removed from pre-schools and ordered to be shut off in elementary schools when not in use, and children aged 16 years or under are banned from bringing cell phones to school.'

The paper includes recommendations for policies that should be implemented by national and international authorities.

In a paper published last year², some of

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Mobiles banned in schools

The Victorian Government has banned the use of mobile phones in schools



Mobile phones will be banned for all students at Victorian state primary and secondary schools from Term 1 2020. The decision was announced by Education Minister for Education James Merlino in late June.

According to the Minister, the ban has been implemented to help prevent distraction, improve student learning and reduce cyber bullying. Recent research shows that cyberbullying affects approximately 53 per cent of young Australians.

Students will be required to switch off their phones and store them securely in lockers from the start of the school day until the final bell. When emergencies occur, parents or guardians can reach their child by calling the school. The only exceptions to the ban will be where students use phones to monitor health conditions, or where teachers instruct students to bring their phone for a particular classroom activity. At all other times phones must be in lockers.

Mr Merlino made the announcement at McKinnon Secondary College, where a ban on students' use of mobile phones is already in place. 'This will remove a major distraction from our classrooms, so that teachers can teach, and students can learn in a more focused, positive and supported environment,' the Minister said.

Since the McKinnon mobile phone ban was introduced, the school has observed an improvement in student behaviour. According to Principal, Pitsa Binnion, 'Our students are more focussed learners in the classroom without this distraction and we have observed improved social connections, relationships and interactions in the school during lunchtime.'

The ban will also have the effect of reducing student exposure to radiofrequency radiation which has been labelled a Class 2B carcinogen by the International Agency for Research on Cancer. Evidence suggests that children and young people are more vulnerable to this radiation and more at risk of developing brain tumours than adults.

In Term 3 2019, the Department of Education and Training will work with principals to develop detailed advice and resources as schools prepare to introduce this policy next year. A review will be conducted at the end of 2020.

'All schools have a legal obligation to provide a safe environment in which to learn. This significant policy initiative is designed to ensure the well-being of young people while at school, free of distraction and potentially cyberbullying,' said psychologist Dr Michael Carr-Gregg.

The Hon James Merlino MP, Media Release, 26.06.19

Oregon bill on school safety

On 13 June the Oregon State Senate unanimously voted in favour of a bill aimed at reducing students' exposure to radiofrequency radiation in schools.

The SB 283 bill states 'The Department of Education shall develop recommendations to schools in this state for practices and alternative technologies that would reduce students' exposure to microwave radiation that the review described in subsection (1) of this section identifies as harmful.'

The Bill also calls for an independent review of scientific studies on the health effects of exposure, particularly in schools.

It has yet to be passed in the House.

Senate Bill 283, <https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/SB283>

Scientists call on world authorities

The Advisors to the International EMF Scientist Appeal, representing 248 scientists from 42 nations, have resubmitted The Appeal (below) to the United Nations Environment Programme (UNEP) Executive Director, Inger Andersen, requesting the UNEP reassess the potential biological impacts of next generation 4G and 5G telecommunication technologies to plants, animals and humans.

They say that there is particular urgency at this time as new antennas will be densely located throughout residential neighbourhoods using much higher frequencies, with greater biologically disruptive pulsations, more dangerous signaling characteristics, plus transmitting equipment on, and inside, homes and buildings.

The Advisors to The Appeal recommend UNEP seriously weigh heavily the findings of the independent, non-industry associated EMF science.

International Appeal Scientists call for Protection from Non-ionizing Electromagnetic Field Exposure

We are scientists engaged in the study of biological and health effects of non-ionizing electromagnetic fields (EMF). Based upon peer-reviewed, published research, we have serious concerns regarding the ubiquitous and increasing exposure to EMF generated by electric and wireless devices. These include—but are not limited to—radiofrequency radiation (RFR) emitting devices, such as cellular and cordless phones and their base stations, Wi-Fi, broadcast antennas, smart meters, and baby monitors as well as electric devices and infra-structures used in the delivery of electricity that generate extremely-low frequency electromagnetic field (ELF EMF).

Scientific basis for our common concerns

Numerous recent scientific publications have shown that EMF affects living organisms at levels well below most international and national guidelines. Effects include increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being in humans. Damage goes well beyond the human race, as there is growing evidence of harmful effects to both plant and animal life.

These findings justify our appeal to the United Nations (UN) and, all member States in the world, to encourage the World Health Organization (WHO) to exert strong leadership in fostering the development of more protective EMF guidelines, encouraging precautionary measures, and educating the public about health risks, particularly risk to children and fetal development. By not taking action, the WHO is failing to fulfil its role as the preeminent international public health agency.

Inadequate non-ionizing EMF international guidelines

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. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) established in 1998 the “Guidelines For Limiting Exposure To Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz)”. These guidelines are accepted by the WHO and numerous countries around the world. The WHO is calling for all nations to adopt the ICNIRP guidelines to encourage international harmonization of standards. In 2009, the ICNIRP released a statement saying that it was reaffirming its 1998 guidelines, as in their opinion, the scientific literature published since that time “has provided no evidence of any adverse effects below the basic restrictions and does not necessitate an immediate revision of its guidance on limiting exposure to high frequency electromagnetic fields”. ICNIRP continues to the present day to make these assertions, in spite of growing scientific evidence to the contrary. It is our opinion that, because the ICNIRP guidelines do not cover long-term exposure and low-intensity effects, they are insufficient to protect public health.

The WHO adopted the International Agency for Research on Cancer (IARC) classification of extremely low frequency magnetic fields (ELF EMF) in 2002 and radiofrequency radiation (RFR) in 2011. This classification states that EMF is a possible human carcinogen (Group 2B). Despite both IARC findings, the WHO continues to maintain that there is insufficient evidence to justify lowering these quantitative exposure limits.

Since there is controversy about a rationale for setting standards to avoid adverse health effects, we recommend that the United

(Continued on page 8)

Cyprus—concerns about children’s health

Cyprian politicians have spoken out about the risks of electromagnetic radiation for children.

At a June conference, Health Minister Constantinos Ioannou said that there is a relationship between the environment and health and that all children have the right to grow up in a healthy environment. He said that evidence shows that electromagnetic radiation and other environmental hazards are harmful to physical and mental health.

Environment Commissioner Ioanna Panayiotou said that reducing children’s exposure to electromagnetic radiation is important, especially at home and school where children spend most of their time. She said that her office would be helping disseminate information about how to reduce children’s exposure to electromagnetic radiation.

Cyprus Mail 24.06.19.

WiFi risks

In a review published in July, scientists showed that Wi-Fi radiation had harmful effects on the male reproductive system.

F Jaffar and team analysed the results of 23 studies conducted on the effects of 2.45 GHz signals on human and animal sperm. They found that exposure adversely affected sperm count, motility and DNA. It also caused ‘degenerative changes, reduced testosterone level, increased apoptotic cells, and DNA damage.’

The authors concluded that the damage was most likely due to oxidative stress and increased testicular temperatures.

Internet users can avoid these problems by using wired (not wireless) computers and tablets.

Jaffar, FHF et al, ‘Adverse Effects of Wi-Fi Radiation on Male Reproductive System: A Systematic Review’, *Tohoku J Exp Med* 248(3):169-179, 2019.

BioInitiative Report Updates

The BioInitiative Report, a review of scientific studies on EMR conducted by a team of independent researchers, has been updated to include additional research published since 2017.

Dr Henry Lai has added additional studies to the Research Summaries database on free radical (oxidative stress) and neurological effects of exposure.

‘Clearly the trend continues that the great majority of studies report effects of low-intensity exposures to both ELF-EMF and RFR, and a small percentage of published studies report that no effects are seen,’ the Report says.

- Of the 225 studies on the link between radiofrequency radiation and free radical damage, 203 (89%) show effects, while 26 (11%) do not.
- Of the 131 studies on the link between power-frequency fields and neurological effects, 117 (89%) show effects, while 14 (11%) do not.
- Of the 305 studies on the link between radiofrequency radiation and neurological effects, 222 (72%) show effects, while 83 (28%) do not.

BioInitiative Report, <https://bioinitiative.org/updated-research-summaries/>

Phones exceed standards

Independent tests conducted by the Chicago Tribune have shown that some mobile phones exceed the US safety standards. The Tribune organised the testing of 11 models of mobile phones produced by four manufacturers to be tested in a laboratory accredited by the FCC (Federal Communications Commission) to perform this testing.

Testing is normally conducted with phones at a distance (up to 25mm) from the body. However, many phones are as close as 2mm from when carried inside users' pockets.

When tested at 2mm from the body, radiation from most phones tested exceeded the standard. Radiation measured from:

- four iPhone 7s was twice the level allowed by the standard
- an iPhone 8 was three times the level allowed by the standard
- a Moto e5 Play was four times the level allowed by the standard
- a Galaxy S8 was five times the level allowed by the standard.

According to the Tribune, manufacturers advised that the testing was not done in the same way that their phones are tested, but were not specific about what the differences were.

The Tribune's exposé showed that some manufacturers specify that their phones are to be tested at a certain distance from the body but do not include that information in user manuals.

The FCC has undertaken to conduct its own tests in the near future.

The tests raise doubts about the reliability of manufacturers' claims to comply with the standards and raise concerns about the consequences of exposure to such high levels of radiation, particularly for long-term use.

<https://www.chicagotribune.com/investigations/ct-cell-phone-radiation-testing-20190821-72qgu4nzlfda5kyuhteieh4da-story.html>

You can read Prof Devra Davis's commentary about the results here: <https://www.chicagotribune.com/opinion/commentary/ct-opinion-cell-phones-radiation-rf-fcc-safety-20190826-s4xcznsnyfb7tef2gosoye7jre-story.html>

Court orders smart meter removal

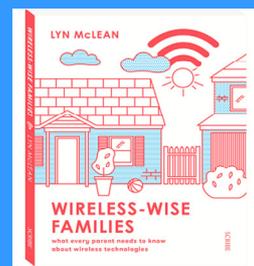
A French court has ordered the removal of 13 Linky smart meters after residents reported health problems after the meters were installed. One, a seven-year-old girl, developed chronic fatigue and sleep problems after the Linky meter was installed on her home.

https://www.francetvinfo.fr/economie/linky/le-tribunal-de-tours-demande-le-retrait-de-compteurs-linky-chez-treize-particuliers-pour-raisons-medicales_3557845.html

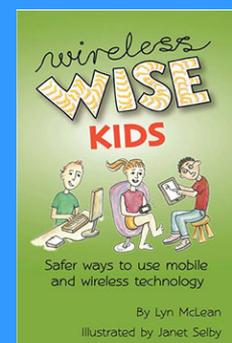
Books by Lyn McLean



The Force



Wireless-wise Families



Wireless-wise Kids

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

Keyless ignition

Did you know that keyless ignition systems expose drivers to radiofrequency radiation?

Since these systems first appeared on the market in the late 1990s in a range of luxury cars, they have become almost standard features of many new cars. In 2018, keyless ignition systems were present in approximately 62% of cars sold.

Keyless ignition systems use a fob, which must be inside the car while the car's being driven.

The car transmits radiofrequency (RFID) signals that covers two zones—inside and outside the car—so it can determine where the fob is. When the fob is in range, it picks up the car's signal and transmits a signal back.

Electrical engineer John Lincoln measured the RF fields from a fob with an Acoustimeter. He was investigating a report that a driver experienced hip pain when he kept his fob in his hip pocket but had no pain when he kept his fob away from the body.

John found that the fob had no field when it was away from the car. 'However,' he said, 'it got quite busy when the door lock or the ignition was operated. There then seemed to be a permanent conversation between the key and the car for as long as the engine was running. The fields were quite small, about 0.1 V/m and 1 uW/m², but persistent.'

What can you do?

If you have a keyless ignition system, make sure you don't carry your fob in a pocket when you're within a few metres of the car or when you're driving.

Non-smart phones

Are you looking for a mobile phone that's not a smart phone?

One of our customers was. His elderly mother needed a mobile phone to accommodate a medical alert system. However, he did not want her to have a smart phone because they expose users to more radiation than non-smart phones.

After doing some research, he found that there are number of basic, non-smart phones still on the market such as the Konka RU9, U6, U7 and FP1. At the time of writing, they are available through Target and BigW.

Mobiles and depression

Scientists have found more evidence that prolonged use of mobile phones is associated with depression.

In a paper published in August, the researchers from China and the US, reported the results of a survey of 11,831 teenagers from Shandong in China. They found that teens who used a mobile phone for two or more hours a day had 1.78 times the normal rate of depression and those who used the phones for five or more hours on the weekend had 1.67 times the normal rate of depression.

The results are consistent with previous research, reported by *EMR and Health*, for heavy screen users. (Liu, J et al, *J Affect Disord* 259:128-34, Aug 2019.)

'prolonged use of mobile phones is associated with depression.'



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'Smart' meters increase costs

A new report from The Australia Institute shows that 'time of use pricing' facilitated by smart meters is likely to drive up household energy costs.

Electricity companies and regulators have pushed for higher electricity prices at peak times, as well as higher 'shoulder' periods. In theory, this provides households with the incentive to move their energy consumption to times of the day when it is cheaper for companies to provide it.

An average household of four that cannot adapt its electricity consumption faces, under time of use charging, increased cost of \$429 per year.

Even if the household can move 30% of its peak electricity consumption to shoulder usage it still faces an electricity bill of \$231, or 10.2% higher than under the flat rate tariff.

"It's clear what's going on here – electricity companies are using the real problem of electricity demand peaks to push for higher consumer prices to increase their profits," said David Richardson, Senior Research Fellow at The Australia Institute.

"Rather than stinging households that have little capacity to shift consumption, regulators and energy companies should incentive those who do have the capacity to shift their usage through demand response programs," he said. "Companies could also subsidise household solar panels and battery storage to reduce peak demand."

Media release, The Australia Institute, <http://www.tai.org.au/content/smart-meters-not-so-smart-electricity-bills>

Neurodegenerative diseases

Here's a theory that may account, not just for the origin of neurodegenerative diseases (NDDs), but for how exposure to electromagnetic radiation may be involved.

In a paper published in the journal *Medical Hypothesis* in June, James Bennet, a specialist in neurodegenerative diseases, put forward the theory that neurodegenerative diseases, such as Amyotrophic lateral sclerosis, Alzheimer's disease and Parkinson's, are caused by deficiencies in energy production in the body's energy factories—the mitochondria.

Free radicals, he says, damage the proteins in mitochondria's energy transport systems, which damage more of these proteins, and so the process continues.

'Once a critical level of energy deficiency is reached in neurons that are high-energy cells, they undergo programmed death, leading to NDD's that affect multiple neuronal populations,' he says.

A considerable number of studies have shown that exposure to power-frequency magnetic fields is associated with an increase in neurodegenerative diseases. Many other studies have shown that electromagnetic fields increase the production of free radicals that could be causing the damage. Bennet's hypothesis could be the connection that links them.

James Bennett, 'Medical hypothesis: Neurodegenerative diseases arise from oxidative damage to electron tunnelling proteins in mitochondria', *Medical Hypothesis* 127, 1-4, 2019.

Mobile phone protection

Blocsock mobile phone



pouches block 96% radiation



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

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(Continued from page 3)

Nations Environmental Programme (UNEP) convene and fund an independent multidisciplinary committee to explore the pros and cons of alternatives to current practices that could substantially lower human exposures to RF and ELF fields. The deliberations of this group should be conducted in a transparent and impartial way. Although it is essential that industry be involved and cooperate in this process, industry should not be allowed to bias its processes or conclusions. This group should provide their analysis to the UN and the WHO to guide precautionary action.

Collectively we also request that:

- children and pregnant women be protected;
- guidelines and regulatory standards be strengthened;
- manufacturers be encouraged to develop safer technology;
- utilities responsible for the generation, transmission, distribution, and monitoring of electricity maintain adequate power quality and ensure proper electrical wiring to minimize harmful ground current;
- the public be fully informed about the potential health risks from electromagnetic energy and taught harm reduction strategies;
- medical professionals be educated about the biological effects of electromagnetic energy and be provided training on treatment of patients with electromagnetic sensitivity;
- governments fund training and research on electromagnetic fields and health that is independent of industry and mandate industry cooperation with researchers;
- media disclose experts' financial relationships with industry when citing their opinions regarding health and safety aspects of EMF-emitting technologies; and
- white-zones (radiation-free areas) be established.

- 1) <http://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf>
- 2) <http://www.icnirp.org/cms/upload/publications/ICNIRPStatementEMF.pdf>
- 3) <https://monographs.iarc.fr/wp-content/uploads/2018/06/mono80.pdf>
- 4) <https://monographs.iarc.fr/wp-content/uploads/2018/06/mono102.pdf>

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<https://www.emfscientist.org/index.php/emf-scientist-appeal>

(Continued from page 1)

the same authors reviewed research on mobile phone use and brain tumours conducted since 2011. They concluded that, 'When considered with recent animal experimental evidence, the recent epidemiological studies strengthen and support the conclusion that RFR should be categorized as carcinogenic to humans (IARC Group 1).'

1. Miller AB et al, (2019) Risks to Health and Well-Being From Radio-Frequency Radiation Emitted by Cell Phones and Other Wireless Devices. *Front. Public Health* 7:223. doi: 10.3389/fpubh.2019.00223, <https://www.frontiersin.org/articles/10.3389/fpubh.2019.00223/full>

2. Miller, AB, 'Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields (Monograph 102)', *Environmental Resesarch*, Volume 167, November 2018, Pages 673-683, <https://www.sciencedirect.com/science/article/pii/S0013935118303475?via%3Dihub>

Protect your
family from
wireless radiation



Shielding singlets for
kids & women



Head protection



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